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Highlighting accessibility issues to staff

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Introduction

Students with disabilities, and indeed all students, are increasingly faced with technology being used in support of their learning and in their assessment. University teaching staff may not necessarily understand the best ways to use technology where disabled students are concerned, though recent legislation (HMSO, 1995 and 2001) has placed a responsibility on educators to consider the needs of these students. In an attempt to raise awareness of accessibility issues, members of Leeds Met's Centre for Excellence in Teaching and Learning – Active Learning in Computing (CETL ALiC) – have created a staff development tool (Harrison and Gray, 2006, 2007; Gray et al, 2008). This takes the form of a computer-based test that includes some attempt to simulate the experience of disabled students with respect to technology in general and computer-based assessment in particular.

The test was first developed in 2006, and has since that time been presented at several face-to-face sessions, both inside and outside Leeds Met. Valuable feedback obtained from these sessions has resulted in improvements in the test's usability and content. It is now available on Leeds Met's website (CETL AliC, 2007: **http://www.leedsmet.ac.uk/inn/alic/CAATest/)**.

Nature of the test

The test was structured as a website with a hierarchy of linked web pages. An introductory page (see Figure 1) explained the purpose of the test and offered links to pages relating to four different areas of disability: visual, hearing, motor and cognitive (including dyslexia). Each of these pages provided further links to questions in that area, each question appearing on a page of its own.

The attempted simulation varied according to the type of disability. A question about colour-blindness showed text and its background as shades of grey rather than as red on green (see Figure 2); a question about tinnitus was inaudible because of the level of background noise; a motor question required very precise mouse positioning; a dyslexia question used impenetrably complex language. The content of the questions was in general related to their form. For example, the colour-blindness question asked which was the commonest type of colour-blindness. The simulation deliberately made many of the questions frustrating, difficult or even impossible to answer, and there was a facility to view the question with the simulation removed. Feedback was provided for all question responses, right or wrong, and in all parts of the test links to relevant web resources were given.

Figure 1: Introductory page

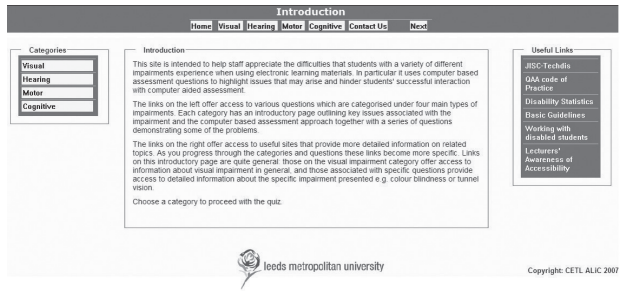
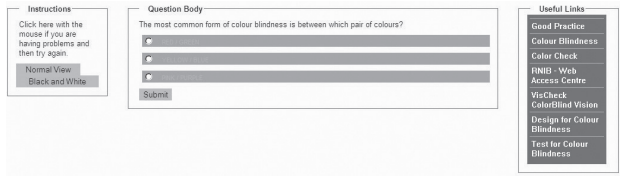


Figure 2: Question about colour-blindness (question body illegible)



Why take this approach?

When staff are learning something new, just as is the case for students, active learning and the opportunity to be involved are highly desirable. "Being active while learning is better than being inactive: activity is a good in itself" (Biggs, 2003). Thus a question-and-answer test that requires active participation is more likely to be a successful method than a simple presentation. To allow for flexibility of use, the test was designed to allow the questions to be attempted in any order, and exploration of outside resources was encouraged. The idea of trying to use simulation was similar to that used by TechDis, the UK educational advisory service on accessibility and inclusion, on their website (TechDis, 2006). There is some criticism of the use of a simulation approach, as discussed by Burgstahler and Doe (2004) in their paper on the use of disability-related simulations in professional development. The major criticisms they report are the difficulty of measuring outcomes, intended or unintended, and the risk of "long-lasting unintended negative results". They state, however, that they "feel carefully designed simulations are effective learning tools in specific situations" and they go on to provide a set of guidelines to follow for the creation of effective simulations together with two examples of "disability awareness activities that maximize positive and minimize negative outcomes". Our test has been designed in line with these guidelines, and one of the two examples given (a simulation of hearing loss) has much in common with an activity in the test.

How the test evolved

The first pilot version of the test, with a small number of questions and a very simple interface, was created in 2006 by members of the CETL ALiC group. It was presented at two face-to-face workshops at Leeds Met, the first in June 2006 and the second at the Staff Development Festival in September 2006, and later at another workshop at the Higher Education Academy Annual Conference in July 2007. Feedback was in general very positive about the test and what it was trying to achieve. Participants appreciated the empathetic and interactive nature of the test, and said that they had been made aware of or reminded of different aspects of disability in relation to the use of technology in general and computer-based assessment in particular. The major criticism was a lack of constructive guidance on how to take forward what the test had indicated to them.

Major changes were made to the pilot version as a result of feedback obtained at these workshops, particularly from the first two. The most important of these changes were in three areas:

1. **Inclusion of a short tailor-written 'Good Practice Guide' for each question, in addition to the weblinks provided**

An example of a Good Practice Guide is shown below. It relates to a dyslexia question in the cognitive category that used convoluted language.

Design Guidelines

Long, dense and complicated sentences make text difficult for the reader.

- Use short simple sentences – average 15 to 20 words
- Don't start sentences at the end of a line
- Use 'you' rather than 'one' in addressing the reader
- Make instructions clear and simple
- Be clear what you want to say before you start writing
- Use short words
- Use active verbs as much as possible – 'we will do it' rather than 'it will be done by us'
- Be concise and to the point

2. **Improvement to the appearance of the interface and the ease of navigation around the site**

The improved interface is shown in Figures 1 and 2 above. Each page has three panels plus navigation buttons at the top of the page; links relevant to the context are shown on the right hand side.

3. **Provision of a wider range of questions**

The pilot test had a very small number of questions, and further questions were created in response to the feedback. The current test has questions on colour-blindness and visual impairment relating to the effects of Tunnel Vision, 'floaters' and Age-Related Macular Degeneration. There are questions in the hearing impairment category on tinnitus and the use of sign language and lip-reading for communication with deaf people. In the physical/motor impairment category there are questions requiring accurate positioning of the mouse, and one exploring the use of the tab key as a keyboard alternative to mouse usage. Several questions in the cognitive/learning impairment category relate to various aspects of dyslexia, and a question with a very short time limit is also included to provide experience of time pressure and the stress it may cause.

Evaluation and further developments

In 2007 the test in its current form was made available on Leeds Met's website at **www.leedsmet.ac.uk/inn/alic/CAATest/**. It has been offered as a self-taught resource to students on the PGCHE course since that time, and more recently Library staff have been asked to look at the test and evaluate it. Their evaluations so far have been quite positive, though some technical problems such as difficulty in viewing video clips have been noted. The major feedback from these staff, however, has indicated that the website used in a stand-alone way, without the support of face-to-face workshop facilitators, is not as easy to navigate as they would like. Comments such as "Some of the 'cognitive' questions could be more obvious as to what the issue is" and complaints that the question about tinnitus could not be properly heard and that the time-limited question went too fast (both deliberate features) also indicate that more work is needed to make the stand-alone version of the test sufficiently self-explanatory in purpose and content as well as easier to navigate.

Conclusions and further work

The computer-based test developed by the CETL ALiC group appears to provide a useful staff development resource for raising awareness of disability-related issues in the area of technology enhanced learning and specifically computer-based assessment. Further improvements to the test itself to make it easier to use as a stand-alone resource need to be made, and the test is likely to remain a work in progress as new questions are created and other improvements made. These improvements would include providing links to valuable resources such as Lexdis (University of Southampton, 2009) that have become available since the test was created.

Future projects planned include:

- asking disabled students their opinion of the test
- adding a social networking feature to the test's website to encourage comment and discussion from users
- assessment of the impact of the test on staff's subsequent actions.

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