A COMPUTER-ASSISTED TEST FOR ACCESSIBLE COMPUTER-ASSISTED ASSESSMENT

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Abstract

This paper describes work in progress on the development of a computer-assisted test to be used for staff development purposes. The aim of the test is to raise awareness of disability issues particularly in relation to the use of technology and of CAA, and to include within itself some simulation of the experiences of people with impairments.

Introduction

Making University teaching staff more aware of disability issues is becoming an increasingly important priority in the light of ongoing Government legislation (HMSO, 1995 and 2001). Staff Development material in this area is readily available, for example in the form of Staff Packs from TechDis, but the work presented here relates to a slightly different approach in that the training material is presented in the form of a computer-assisted test. The idea behind this was that staff might have difficulty in finding the time to attend half- or full-day workshops, whereas they might find a short test of half an hour or so to be both manageable and perhaps also enjoyable. The test was intended to give some simulation of the experience of disabled students, as well as to impart information. It was decided that such a test could be developed with fairly modest resources, and that these could be made available within the "Centre of Excellence for Teaching and Learning – Active Learning in Computing" (CETL ALiC), a HEFCE-funded collaborative project involving Leeds Metropolitan University and the universities of Durham, Leeds and Newcastle (HEFCE, 2005, Durham University, 2006). The CETL's objectives include staff development and disability issues.

Aims of the Test

The test questions were developed within Innovation North (the faculty of information and technology) at Leeds Metropolitan University with the initial intention of promoting staff awareness within the Faculty of disability issues, with particular reference to the use of technology in support of disabled students and of the need to consider accessibility in the context of computer-assisted assessment (see Ball, 2005 and Phipps and McCarthy, 2001). Given that the staff and the students they teach are within the computing and technology disciplines, there is a particular emphasis on the role of technology in teaching and learning, as the students need to engage with a range of hardware and software in conjunction with the subject matter of their course. Computer-assisted assessment is widely used, and appears to be popular with both staff and students, but staff appreciation of the need to consider accessibility in this area is not necessarily high. The aims of the test were broadened over time to consider the staff development needs of less technologically oriented staff in other faculties.

Test Content

A strategy for developing questions was devised. Principles of good practice in question design (for example as propounded by Bull and McKenna, 2004) were followed, and advice on content was received from the Disability Services Manager at Leeds Metropolitan University. Because of the aim to simulate certain experiences of disabled students in order to encourage participants to acquire empathy with them, some of the test questions had to be fitted with “escape routes” to allow the questions to be re-displayed or re-spoken without the imposed constraint, or they might be impossible to decipher. This led to a decision to have information available on the screen about how to reformat the question, together with information about the type of impairment illustrated and suggestions about good practice to be followed.

A grouping of four areas was used:

- visual impairment
- hearing impairment
- physical / motor impairment
- cognitive / learning impairment

Ideas for questions within these areas were generated. Sometimes the content of the question and the form of the question could be related, sometimes the content might be unrelated to the form, being either relatively trivial or about an unrelated aspect of disability issues. Some questions required escape routes, whilst others did not.

An analysis of the question ideas was thought to be helpful, to allow the developers to review the overall balance of the test, and a grid was drawn up showing for each question:

- which of the four areas it fell within
- what specific impairment was addressed by the question's form
- what specific impairment was addressed by the question's content
- whether an alternative format was needed (an escape route)
- whether the question related to disability specifically in relation to CAA, or to disability in relation to technology generally

The production of questions proceeded as follows. For each question, an idea was suggested, a storyboard design produced, the question implemented as a Web page using HTML and JavaScript with Cascading Style Sheets, and an analysis according to the factors listed above carried out.

Two Example Questions

1. A question to illustrate colour-blindness has stem "What is the most commonly occurring form of colour-blindness?" and options "Red/Green", "Yellow/Blue" and "Purple/Pink". These options are initially rendered almost illegibly with little colour discrimination between lettering and background, to try to give an experience of how they might appear to a colour-blind person. It is then possible to request that the options be rendered in contrasting colours, with the "Red/Green" option appearing as red text on a green background, and the other two options appropriately coloured. A further request can be made to have the options shown without colour, as black text on a white background. Advice reminding staff to be aware of colour-blindness when using CAA is also displayed, together with relevant references (for example Waggoner, 2004).

2. To draw attention to the difficulties some users experience over fine motor control of a mouse, one question has the radio button option choices moving around the screen whenever an attempt is made to click on them. Again, advice and appropriate references (for example WebAIM, 2006) are offered to staff.

Usage of Test

The test was designed to be used as part of the regular Staff Development sessions for staff teaching in the computing and technology areas, who are the most likely people within the University to be making use of computer-assisted assessment. The current version of the test is planned for first delivery in June 2006 to a group of these staff, and additionally to a group of staff in Leeds Metropolitan's Carnegie Faculty of Sport and Education.

Conclusion and Future Work

There are several issues arising from this work that will need to be studied in the future. They may be summarised as:

- evaluation and improvement of the test itself
- consideration of its context and usage
- range of applicability

Feedback will be sought from those taking the test, and an evaluation of its performance will be carried out. The possibility of receiving input from disabled students, using focus groups, has been discussed with the Disability Services Manager. Improvements to questions, the removal of unsuitable questions and the creation of further questions will be an ongoing process.

Issues regarding the context of such a test need to be thought through – for example, if some of the takers of the test themselves have impairments (possibly undeclared) what would be the effect on them?

The test could be made available at events that are organised from time to time by the CETL to disseminate results from projects undertaken. These events take the form of informal displays (”roadshows”) to which passers-by drop in for information or advice, or of organised workshops. Perhaps the test might be useful to staff teaching in settings other than Leeds Metropolitan University – for example in Further Education Colleges or schools?

In conclusion, this small study has sought to investigate the possibility of using computer-assisted testing as an aid to staff development in the area of disability issues with respect to technology and CAA. Further work, including an evaluation of its success, remains to be carried out.

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