INCORPORATING AVATAR SIGNING INTO ASSESSMENT ITEMS

Mhairi McAlpine, John Glauert, Vince Jennings, Neil Thomas and Antony Rabin

Incorporating Avatar Signing
Into Assessment Items

Mhairi McAlpine, Scottish Qualifications Authority;

John Glauert, University of East Anglia;

Vince Jennings, University of East Anglia;

Neil Thomas, RNID;

Antony Rabin, RNID;

Abstract

Approximately 50,000 people in the UK, mostly those born deaf, use British Sign Language (BSL) as their first or preferred language (RNID, 2007). The Disability Discrimination Act puts new responsibilities onto examination boards to ensure adequate access for all candidates, however we are aware of ongoing issues and limitations with the current support that is offered to deaf candidates, and have rejected other solutions on the basis of cost and practicality. This project explores the possibility of incorporating encoded sign language into assessment items which can then be signed by an avatar

Introduction

Approximately 50,000 (or approximately 1 in 1000) people in the UK, mostly those born deaf, use British Sign Language (BSL) as their first or preferred language (RNID, 2007). For many deaf people, born with no hearing, British Sign Language (BSL) is their first language. Since natural spoken language is phonetically based, deaf people have less cues to assist in learning to read and levels of literacy are typically several years behind hearing people of the same age (Marschark, 2007). They cannot use word sounds for learning and their poor literacy compared to their hearing peers, puts them at a disadvantage when taking assessment tests in English.

The Disability Discrimination Act came into force for examination bodies in 2006. As such we are now required to ensure that all candidates have equal access to our examinations regardless of any disabilities. We also have a responsibility to ensure that our examinations are sufficiently reliable and that candidates are not advantaged by any support that they may get to access the examination.

Difficulties experienced by Deaf candidates

The SQA allows communications support to be provided for deaf candidates when they take an examination – should they prefer to do the examination through the medium of BSL, however the quality of the interpretation may vary – particularly for examinations where there are technical terms used that the interpreter may not be familiar with. Additionally as BSL is a visual language, interpretation itself may provide the answer to some of the questions that we might want to ask candidates. The Joint Council for Qualifications comments on the role of interpreters: *"Many signs are iconographic, and therefore explain the meaning of the subject-specific word being assessed: for example, the sign for 'perimeter' draws the outline of the shape in space, and so indicates that the perimeter is the distance around the outside of the shape"* (JCQ, 20??).

In 2003, the SQA launched a new examination in IT skills called PC Passport. Although the exam could be done on paper, it could also be completed on computer. Centres and teachers of deaf candidates found the computerised assessment very difficult to work with. A lack of highly qualified interpreters means that the centres have had to use non-native signers to translate the items and the randomised nature of the questions and on-demand test construction meant that the signers were not able to have prior access to the questions. Difficulties were also experienced by translators as a number of computer terms are relatively obscure and on occasion very difficult to sign without revealing the answer to the question. Video clips of signed interpretations were suggested, however this was considered expensive and non-sustainable. A new sustainable and standardised solution was called for.

An avatar signing solution

The University of East Anglia has been researching the use of avatars to provide signed support for native BSL signers for a number of years (Elliot et. al, 2004). Funded by the Teaching and Learning Research Programme, the Scottish Qualifications Authority, the University of East Anglia and the RNID are developing standards compliant questions which incorporate the instructions for sign language representation, which can then be passed to an avatar who can sign the question on request.

This has a number of advantages over video production

- Good quality video needs relatively sophisticated recording facilities.
- Ensuring continuity is problematic as materials are updated since the same signer, clothing, lighting, and camera settings must be maintained.
- Stitching sequences together is impractical, requiring a complete re-shoot if minor changes are needed.

- Despite improvements in network bandwidth and storage capacities, transmitting and storing high quality video consumes significant resources.

The avatar signing process is done by first recording a video of signs used. The signs are then notated in a form of "writing" called HamNoSys, which records the movements that the signer is making.

Figure 1: Example of HamNoSys Notation

To develop avatar signing, the individual signs are stitched together along with any contextual amendments, before being translated into an XML Schema (SiGML) which encodes those movements. The XML schema is passed to specially developed avatar software which then moves the avatar according to the encoded instructions.

Figure 2: Anna, the Avatar used by the project

This project explores the question of support for automated assessment, using the PC Passport qualification as an exemplar. QTI 2.0 encoded questions are annotated with the SiGML notation. A specially designed delivery vehicle based on the R2Q2 development with incorporated avatar reads these questions and uses the SiGML to sign the question to the candidate.

It is hoped that the research associated with this development will give us an idea about how equitable such provision may be, eliminating the variable quality of current translations; ensuring that students have their questions signed to them using accepted vocabularies and eradicating any possibility of "clues" being given by the interpreter in their interpretations.

References

R. Elliott, J. R. W. Glauert and J. R. Kennaway *A Framework for Non Manual Gestures in a Synthetic Signing*, 2nd Cambridge Workshop on Universal Access and Assistive Technology, (CWUAAT}

RNID (2007) *Deaf Awareness Factsheet* RNID, London

M. Marschark (2007) *Raising and Educating a Deaf Child,* Oxford University Press, Oxford