Assisting Lecturers to Adapt E-learning Content for Deaf Students

F. Javier Bueno
Dept. de Ciencias de la Computación
Universidad de Alcalá
Alcalá de Henares, Spain
fjavier.bueno@uah.es

M. Goretti Alonso
Dept. de Ciencias de la Computación
Universidad de Alcalá
Alcalá de Henares, Spain

J. Raul Fernández del Castillo
Dept. de Ciencias de la Computación
Universidad de Alcalá
Alcalá de Henares, Spain

ABSTRACT

Deaf students hardly ever finish higher studies. One of the biggest difficulties they have to face in studying for their degrees is reading comprehension due to their poor literacy skills.

It is believed that though deaf people cannot hear, nothing impedes them being able to read because, in general they are not blind. Unfortunately this is not true as showed in [1]. This results in another barrier to their integration process in the education system, given that most of the contents delivered by a lecturer in a standard course are written, whether they are printed, downloaded or accessed in an e-learning platform.

There are some questions to be considered if we want to find a solution for the problem depicted above. Firstly, it can be affirmed that each deaf person learns at his own pace and, what it is more important, that this pace is clearly different to his or her hearing classmates' pace [1]. Secondly, a number of studies show that deaf people whose main way of communication is sign language process images in an easier and more efficient way than words [2]. Thirdly, nowadays e-learning systems are used world-wide due to its ease of access and the pace being determined by the learner.

Taking all these factors into account we should deduce that e-learning systems could constitute an appropriate way of learning for deaf people if courses were adequately adapted.

Unfortunately, the vast majority of lecturers do not know about the problems that deaf people have to face when reading. Therefore, nearly all the written resources for education, including e-learning courses, are written for hearing people without any kind of adaptation.

For the reasons depicted above it is necessary to adapt texts used in web pages or e-learning courses so they can understand them.

In a previous work submitted and accepted to this conference, we have referred that we have obtained a knowledge database with several hundreds of words and expressions related to Computing Science and terms in common use that deaf people do not understand. Once we have this information, one of the following steps to adapt a text or is to enrich that vocabulary with visual resources like pictures or videos in sign language in order to translate or to explain the concepts expressed by that set of words. Nevertheless, this work is really heavy even if you have the knowledge database to hand.

For this reason, we present a tool able to assist lecturers to adapt texts in a semiautomatic way. When given a text this tool highlights words or expressions difficult to understand for a deaf person with intermediate literacy skills and links them to some visual resources like the above mentioned. In addition, each image or video incorporates a short description of the word or concept to be explained with the visual resource.

The tool is a light-weight, easy to use, accessible web application that can be used not only by teachers but also by deaf persons who want to expand the knowledge database inserting more words or expressions that they do not understand.

Categories and Subject Descriptors

K.4.2 [**Computers and Society**]: Social Issues—*assistive technologies for persons with disabilities.*; K.3.2 [**Computers and Education**]: Computer and Information Science Education—*computer science education.*

General Terms

Experimentation, human factors.

Keywords

Content adaptation, deafness, e-learning, literacy skills.

1. REFERENCES

[1] F. Alvira, A. Cruz, and F. Blanco. Los problemas, necesidades y demandas de la población con discapacidad auditiva en España: una aproximación cualitativa. In *Colección Estudios e Informes. Serie Estudios num 1. Observatorio de la Discapacidad.* IMSERSO, 1999.

[2] J. M. Rodríguez Santos. *La deficiencia auditiva: un enfoque cognitivo.* Publicaciones Universidad Pontificia de Salamanca, Salamanca, 1990.

ITiCSE'07, June 23–27, 2007, Dundee, Scotland, United Kingdom.
ACM 978-1-59593-610-3/07/0006.