Chapter 88
New Communication Technologies for Inclusive Education in and outside the Classroom

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ABSTRACT

This chapter explores new communication technologies and methods for avoiding accessibility and communication barriers in the educational environment. It is focused on providing real-time captions so students with hearing disabilities and foreign students, among others, could participate in an inclusive way in and outside the classroom. The inclusive proposals are based on the APEINTA educational project, which aims for accessible education for all. The research work proposes the use of mobile devices for teacher and students in order to provide more flexibility using the APEINTA real-time captioning service. This allows using this service from anywhere and at anytime, not only in the classroom.

INTRODUCTION

Historically, students with functional diversity (students with special needs, students with disabilities, etc.) and foreign students have found accessibility and communication barriers while trying to access the educational system. For in-stance, most of the hearing impaired students do not regularly assist to the classroom because they usually face communication difficulties with the teacher or other classmates. Foreign students can also find those communication barriers when they do not have enough level in listening and under-standing the language spoken in the classroom.

This chapter presents new ways of communication for inclusive education inside and outside the classroom. The research work is based on the inclusive proposals of the APEINTA project (Iglesias et al, 2009) which main aim is to provide accessibility in education, whether it is in or out of the classroom.

APEINTA is the result of collaboration among the Department of Computer Science and the Department of Electronic Technology, Universidad Carlos III, and the Spanish Centre of Captioning and Audiodescription (CESyA)[1]. This project was initially supported by the Ministry of Science and Innovation (2007 I+D projects - EA2008-0312) within the program of Studies and Analyses - Actions to Improve the Quality of Higher Education and the Activity of University Professors. Currently, the research presented in this chapter is being partially supported by France Telecom España S.A. and the MA2VICMR (S2009/TIC-1542), GEMMA (TSI-020302-2010-141) and SAGAS (TSI-020100-2010-184) research projects.

The APEINTA project is focused in two main inclusive proposals: the first one deals with eliminating the communication barriers that hearing impaired students or foreign students usually find in the classroom, providing automatic real-time captioning and other mechanisms to ease the communication with the teacher and others students; the second one also deals in providing an accessible Web learning platform with accessible digital resources, so every student can access them, with independence of the place where he is.

The work presented in this chapter is focused in the first proposal, studying new communication technologies for making easier the communication inside and outside the classroom among the course's participants (teachers and students), stimulating the inclusive and collaborative education.

Real-time captioning has been demonstrated as a very useful tool in educational environments for all students. Students with hearing impairments can literally read the teacher discourse and they can participate in an inclusive way during the class thanks to real-time captioning. Foreign students who do not completely understand the teacher discourse are able to see the correct spelling in the captions, providing additional support to these students. But captioning can be useful for all the students, not only for students with disabilities or foreign students. For instance, real-time captioning can compensate noisy backgrounds, as it usually occurs in a classroom. Captioning is also useful in places where sound is not allowed, for instance, when the student is watching a pre-recorded or on-line video from the Web learning platform when travelling in public transport and he is not wearing earphones.

At this point, it is important to remark that APEINTA project has been awarded with the prize of the Spanish Confederation of Families of Deaf people (FIAPAS) in its 2009 call for applied research work related to hearing impairment in the area of education, where the first architecture of APEINTA was presented. It has also won the delegates award of the 2011 edition of the Web Accessibility Challenge in 8th International Cross-disciplinary Conference on Web Accessibility (W4A'11[2]), sponsored by Microsoft, where the new communication mechanism in APEINTA and its new architecture described in this chapter were presented.

BACKGROUND

During last decades, educators, pedagogues, psychologists, scientists, researchers and, in general, people from very different disciplines related to education have tried to achieve anti-discriminatory education environments according to the current laws related with inclusive education. These laws try to ensure an inclusive education system at all levels as a right of persons with functional diversity, rejecting segregation and discrimination.

There exist international and national laws which regulate the inclusive education. For instance, internationally, the normative of the United

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