Chapter 56

Intelligent Adaptable e–Assessment for Inclusive e–Learning

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ABSTRACT

Access to education is one of the main human rights. Everyone should have access to education and be capable of benefiting from it. However there are a number who are excluded, not because of a lack of ability but simply because they have a disability or specific need which current education systems do not address. A learning system in which content, tools and interfaces can be personalised and adapted to the individual needs and preferences of a variety of learners, including those with disabilities, becomes inclusive. Assessment is an integral part of an e-learning environment and therefore it has to provide not only inclusive e-learning content but also inclusive e-assessment. The proposed research investigates an intelligent adaptable e-learning system for assessing students’ level of skill, knowledge and understanding regardless of their disabilities or accessibility needs. It is based on an innovative use of world’s first open source adaptable widget design and authoring toolkit (WIDGaT) as the prototyping environment.

INTRODUCTION

(1) Everyone has the right to education.

(2) Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms.

Article 26, Universal Declaration of Human Rights

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You cannot hope to build a better world without improving the individuals. To that end each of us must work for his own improvement, and at the same time share a general responsibility for all humanity, our particular duty being to aid those to whom we think we can be most useful.

Marie Curie

Education and active social inclusion are key items in the European social agenda (http://ec.europa.eu/europe2020/europe-2020-in-your-country/bulgaria/country-specific-recommendations/index_en.htm). The particular focus is on less advantaged groups, those with special needs, school dropouts and adult learners. In January 2013 findings of the Social Inclusion Expert Report (European Commission, 2012) concluded that the development and implementation of a comprehensive and integrated strategy for an inclusive labour market with access to quality services had limited impact. “While there has been progress in some Member States, this is often uneven and partial. Overall, there is still a long way to go ... Somewhat more progress has been made in designing and implementing active inclusion measures for those who can work than for those who cannot work.” (European Commission, 2012).

However every individual has the basic human right of access to education. This applies regardless of disability or special needs. The opportunity to acquire new knowledge and skills and to be able to demonstrate them to others is fundamental for personal development and employability; consequently inclusive assessment is one of the most important components of any educational system. This is a gap which technology can help to fill and the fundamental research question is:

Can e-assessment technologies and strategies be developed which enable formative and summative assessment of individual skills, knowledge and understanding regardless of disability?

Even though access to education is a basic right there are many who are still excluded not because of a lack of ability, but simply because they have a specific need or disability which current education systems fail to address (Green, S., Pearson E., & Stockton, C., 2006). The design of learning experiences which meet the needs of everyone is problematic: this is sometimes referred to as ‘universal design’ (European Design for All e-Accessibility Network EDeAN, n.d.). The increased use of the web and mobile systems (accessible rich internet applications or ARIA) and the ready availability of assistive technologies (ATs) make the concept of ‘inclusive design’ timely and more practical.

**TIMELINESS AND IMPORTANCE OF THE PROBLEM**

Promoting social inclusion is one of the most important policy aims of the European Union. This is demonstrated by the fact that 2007 was the European year of equal opportunities for all. In addition, 2010 was the European year for combating poverty and social exclusion (http://ec.europa.eu/social/main.jsp?langId=en&catId=637). Since these priorities stay in the forthcoming Horizon 2020 programme, the proposal addresses the key successive priorities and continuity in the EU research schemes and policies (http://ec.europa.eu/research/horizon2020/index_en.cfm).

The European Community (European Commission, 2010; European Commission, 2004) and academic institutions agree that e-learning content should be accessible to a wide range of individuals. User profiling and adaptability are becoming increasingly important to all higher education establish-