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Higher Education for All

From Challenges to Novel Technology-Enhanced Solutions

First International Workshop
on Social, Semantic, Adaptive and Gamification Techniques
and Technologies for Distance Learning, HEFA 2017
Maceió, Brazil, March 20–24, 2017
Revised Selected Papers

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Preface

Economic development depends on highly skilled, educated individuals. Lower education levels are linked to low income and poverty. In the UK, higher education is available to many high school graduates ($\sim$50% in 2011–2012 [3]). In Brazil, the numbers are much lower (< 20%; OECD, 2014). Pioneering efforts from academia and the business sector (incl. proposers) to support pupils from impoverished, underprivileged backgrounds to enter universities (to pass the intensive public exam "ENEM") are e-learning solutions. Still, initial data show typical distance-learning problems: isolation and lack of customisation.

This preface presents the main ways these essential problems and issues were tackled via a Newton Research Links Workshop, and subsequently how they were followed up in this book. We explore major themes that emerged from the submissions we received.

The Newton Researcher Links workshop (http://newton.nees.com.br/) invited UK, Brazil, and international researchers to contribute toward solving the urgent, timely problem of access for children from impoverished backgrounds, via new, seamless personalisation, gamification, semantic and social interaction techniques to meet the specific needs of the millions of candidates, based on (big) data analysis, user analytics, scalability. It is dedicated to promoting equal opportunities. This workshop was extremely successful, with excellent discussions and great networking and further funding applications resulting from it. What it showed, however, was that we were only scratching the surface, and that further efforts were needed to address the overall topic of "Higher Education for All," a noble goal in today's society.

Therefore, we proposed this book, *Higher Education for All: From Challenges to Novel Technology-enhanced Solutions*, opening the Call for Papers beyond the original participants, on an international scale. As a result, we received 31 chapter submissions, out of which, with the help of our Program Committee, we were able to select the 12 most relevant and best papers to include in our book (with a 38% acceptance rate).

The selected papers are both broad in scope, representing a good variety of work toward scaffolding and supporting higher education for all, and centred around three major topics that we identified as follows:

- Higher education online around the world
- User modelling and grouping
- Technology-enhanced solutions: gamification and educational games

Thus, the book commences with the overall picture of issues and solutions in higher education around the world, starting with an analysis of pupils' concerns regarding transition into higher education (Chap. 1), then moving on to a cultural view of higher education in the Amazon, including its solutions and challenges (Chap. 2). This topic delves into a more detailed view of the work for higher education, looking into undergraduate students and their language (Chap. 3). Finally, a major area of current

expansion in higher education worldwide is tackled by the chapter on helping teachers of massive open online course (MOOC) do their jobs (Chap. 4). Especially in remote areas, MOOC seem to hold the promise of the future, but currently they are not delivering, and teachers (as well as their students) need to be supported.

Among the methodologies for addressing online learning issues in wide settings in particular, personalisation holds the strongest promise. In this context, user modelling (learner modelling) is essential. Thus, the next topic on modelling and grouping users commences with Chap. 5, on group formation in computer-supported collaborative learning (CSCL), dealing with the social aspects of the online learning process. The knowledge acquisition process, another essential process to trace while modelling online users, is dealt with in the next contribution (Chap. 6). This process is made especially interesting when tackling areas of complex nature. Another vital, yet often neglected, aspect of user modelling, especially in an international set-up with learners from many corners of the world, is the cultural aspect. This is targeted in Chap. 7, from the fundamentals to an experiment. Finally, within this topic, the metacognitive ability[1] of learners is also examined: The elusive knowledge of "knowing what one knows" is not only hard to master, but also equally hard to model within an online environment. This challenge is addressed in Chap. 8.

The final, and thus the most modern and relevant topic in terms of technology for online learning in general, and higher education in particular, is that of delivering the knowledge in a fun and interesting way – similar to how a really good tutor would deliver in one-to-one teaching, or in a very small learning group setting. One of the hottest current areas in this respect is related to games: from educational games (i.e., games that have aspects related to education) all the way to gamification (i.e., e-learning systems that may mimic one or more aspects of the game industry, without being games). The motivation behind introducing games, beside the fun aspect, is the hope that, at some point in the future, our e-learning systems will be working in a similar way to computer games, in the sense that learners will be "hooked" to them without any external pressure, and will want to explore and learn more of their own accord, thus being immersed completely in the experience [1]. While there is a great buzz on the topic of educational games and gamification, this topic starts with a word of caution: the dark side of gamification is also explored, in terms of potential negative effects to be avoided (Chap. 9). Next, an actual game used for software engineering education is presented in Chap. 10 to exemplify the area. Following this, the social (and thus, here, collaborative) aspects of the online interaction of students are explored via gamifications, as well as other state-of-the-art technologies, such as ontologies (Chap. 11). Finally, the last chapter in this topic and in the book (Chap. 12) investigates the designer process, to help developers put together such serious game design via agile methodology.

We wish to specifically thank the Programme Committee for their work in making this book a high-quality publication; their priceless comments helped in revising the papers to be both more appropriate and more relevant for the overall topic of this book.

[1] http://www.cambridgeinternational.org/images/272307-metacognition.pdf

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