

SUMMARY

This doctoral thesis examines the feasibility of incorporating a mobile solution founded on the principles of blended learning within the Romanian undergraduate educational system. Particular emphasis is placed on the concept of augmented reality and its capability to enhance the existing educational practices.

The thesis commences with an exhaustive analysis of the degree of digitalization within the educational sector, with a particular emphasis on the Romanian undergraduate education system. Subsequently, the thesis advances by enhancing the comprehension of the blended learning concept, coupled with an examination of the fundamental technologies of the emerging educational paradigm, namely augmented reality, virtual reality and artificial intelligence. Historically, while there has been notable interest from both governmental authorities and private initiatives towards the advancement of digitalization, the focus has predominantly been oriented towards the provisioning of equipment for schools rather than the cultivation of enduring digital competencies among educators and students. Furthermore, the Higher Education sector in Romania has received more substantial support for the integration of mobile applications into the learning process, whereas the undergraduate system has exhibited only modest attempts, often in the form of preliminary experiments.

A central component of this thesis is the comparative analysis of the three fundamental technologies associated with Education 4.0: augmented reality, virtual reality and artificial intelligence. The study clarifies their distinct characteristics and examines the respective advantages and disadvantages of each technology. Following this comparative evaluation, the conclusion is reached that augmented reality holds the greatest potential to provide substantial benefits upon the undergraduate education system in Romania.

The concept of blended learning was examined among the primary stakeholders of the undergraduate education system, specifically students and teachers. Consequently, two case studies utilizing questionnaires were conducted with 376 teachers and 385 students in Bucharest. The focus was on the scholarly population from public schools in Bucharest. These studies assessed the participants' perspectives on blended learning, as well as the efficacy of incorporating a mobile application into the educational process. The findings from these studies formed the basis

of a prototype in the form of a mobile application utilizing augmented reality, which was further detailed in the thesis.

The prototype was evaluated among a scholarly group consisting of 122 pupils within the Ialomița district. The sample population for this study included students from both urban and rural environments. The investigation pursued three primary objectives concerning the prospective benefits of the prototype: enhancing pupils' motivation, reducing the dropout rate and assessing the feasibility of utilizing the prototype in environments with limited Internet connectivity.

The thesis concludes that mobile solutions incorporating augmented reality have the potential to significantly enhance educational processes within the undergraduate education system in Romania. This approach may positively influence the three identified problematic areas. Firstly, the thesis demonstrates that such applications may enhance students' motivation, cultivating a greater curiosity and receptiveness towards education. Secondly, students in regions with limited Internet access can fully benefit from these mobile applications. Finally, the thesis asserts that mobile applications based on augmented reality can positively affect the dropout rate in Romania.

Keywords: Education 4.0, augmented reality, blended learning, mobile solutions, undergraduate education system.

