

## Editorial

# Current Trends in Game-Based Learning—Introduction to a Special Collection of Research

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The potential of digital games to promote learning is a growing field of research. Researchers have been extensively analyzing the impact of games on learner motivation and engagement in educational settings [1] and even reporting the contribution of this approach to a variety of learning outcomes, such as concept understanding [2,3] and soft skills development [4].

A myriad of technological options can be used to support digital game-based learning. One popular technology in this context is the mobile device, considering its high penetration rate in our societies, even among young people. These can be combined with other technologies, such as Augmented Reality (AR) or Virtual Reality (VR), to increase students' motivation and engagement in learning processes [5,6].

Because of this, there is an emergent need to know and promote good practices in the development and implementation of game-based learning approaches in educational settings. This was the motto for the proposal of the Education Sciences (ISSN: 2227-7102) Special Issue “Current Trends in Game-Based Learning”. This book is a reprint of this Special Issue, collecting a set of five papers that illustrate the contribution of innovative approaches to education, specifically the ones exploring the motivational factors associated with playing games and the technology that may support them.

Considering the above, the first work in this book, by Lúcia Pombo and Margarida M. Marques, presents a study where the “Educational Value Scale of Mobile AR Games” was used in an illustrative case: The EduPARK app. The study revealed that games sustained by mobile devices and integrating AR can have high educational value, particularly with students aged 10 to 15 years old.

Second is a piece from the same authors focusing on the need for teacher training in these innovative approaches. Hence, the authors conducted a case study of the impact of a teacher-training initiative on trainees' professional development. It revealed improvements in teachers' knowledge and experience with game-based learning, mobile learning, and AR, as well as their ability to identify both benefits and barriers to these approaches.

The third work, by Dionísia Laranjeiro, discusses the process of designing, developing, and evaluating a set of four thematic educational apps composed of a set of games suitable for preschoolers in autonomous or guided activities. This work was developed under the “Aprender XXI” (Learn XXI) project by a multidisciplinary team of educational researchers, technology developers, and end-users, in this case, children and kindergarten educators.

The fourth chapter, by Rita Tavares, Rui Marques Vieira, and Luís Pedro, focuses on the promotion of primary students' scientific competences and self-regulated learning through their interaction with a mobile app. More specifically, it presents the conception process of the interaction design with a strong theoretical base, as it considers a learning approach proposal that combines the Universal Design for Learning principles, the Inquiry-Based Science Education and the BSCS 5E Instructional Model.

Finally, the work of Friday Joseph Agbo, Ismaila Temitayo Sanusi, Solomon Sunday Oyelere, and Jarkko Suhonen presents a literature review on the use of VR in computer sci-



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ence education. Among other relevant findings, this study reveals that game-based learning and gamification have been leveraged for computer science education integrating VR.

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