Introduction to the GaLA Conf 2019 Special Issue

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It is a great pleasure for us to have the opportunity to introduce this issue of the IJSG, which is dedicated to the Games and Learning Alliance Conference (GaLA Conf) that was held in Palermo, December 5-7, 2018. Almost 70 participants converged in this all beautiful, historic, and modern city for a lively workshop and for sharing knowledge and experiences related to serious games, their techniques and their application. A number of the best conference papers were selected, and the authors were invited to extend their paper with at least one third new content, and to submit their paper to IJSG with a regular review process. This issue contains seven selected articles, which gives an overview of the rich field of serious games. So among the topics covered in this issue there are:

- gamification of learning experiences,
- serious games in everyday life,
- artificial intelligence as a means to significantly increase the effects of serious games,
- understanding the effect of learner characteristics on the effects of serious games,
- assessing the learning outcomes of serious games systematically, and
- games as objects of generative learning approaches.

The first article, by Darina Dicheva, Keith Irwin and Christo Dichev is titled "Exploring Learners Experience of Gamified Practicing: For Learning or for Fun?" [1]. The authors point out that gamification is still a challenging procedure, not least because the underlying motivational mechanisms could not yet be satisfactorily investigated and because empirical findings on motivational mechanisms are still rare. Further, there is also a lack of appropriate tools for designing gamified learning experiences. Consequently, this article presents a study on the gamification of out-of-class practicing in a data structure course, based on the platform OneUp, which supports the design of gamified learning experiences.

The second article by Jan Dirk Fijnheer, Herre Van Oostendorp, and Remco Veltkamp, titled "Household Energy Conservation Intervention: A Game versus Dashboard Comparison" [2] describes the application of a serious game in an everyday context: the education of citizens regarding the saving of energy in households. Compared to a control group using a dashboard without game features, an energy saving of 33% was measured - a result that makes it worthwhile to continue working on the use of serious games.

The application of Artificial Intelligence (AI) in serious games is examined by Michael Kickmeier-Rust and Andreas Holzinger in their article "Interactive Ant Colony Optimization to Support Adaptation in Serious Games" [3]. Personalization of gaming experiences is seen as an important factor in the successful use of serious games. Currently, artificial intelligence and machine learning are researched as methods for personalization. This article shows that integrating artificial intelligence with human cognition and human intuition can contribute to optimizing the personalization of gaming experiences.

The fourth article "The role of disposition to critical thinking in digital game-based learning" [4] by Manuel Gentile, Giuseppe Città, Salvatore Perna, Alessandro Signa, Valentina Dal Grande, Simona Ottaviano, Dario La Guardia, and Mario Allegra contributes to the understanding of mechanisms of serious games on learning. Using the uManager game, the article shows that the player characteristic "Disposition to critical thinking" influences the actual learning outcome of the players. A higher disposition to critical thinking leads to an increased investigation of decision-relevant information in the game and thus to better learning outcomes.

Mobile Math Trails for Europe (MoMaTrE) is a project to develop a platform for the mathematical trails, i.e. the playful rededication of outdoor activities into learning activities for mathematics In their article "Shallow and Deep Gamification in Mathematics Trails" Iwan Gurjanow, Miguel Oliveira, Joerg Zender, Pedro A. Santos, and Matthias Ludwig [5] investigate the use of shallow gamification mechanics such as points and leaderboards to increase motivation for the foreseen conduct of mathematics trails. In accordance with some of the literature no statistically verified effects are reported. Therefore, more effective gamification elements, called deep gamification elements, such as the creation of social contexts, are proposed and discussed.

Although effects of serious games on learning outcomes have been proven, Sobah Abbas Petersen, Manuel Oliveira, Kristin Hestetun, and Anette Østbø Sørensen aim at the research gap of systematical assessment of learning outcomes induced by serious games. In their article "ALF - a proposed Framework for Evaluating Accelerated Learning in Industry through Games" [6] an assessment framework for learning outcomes is developed and validated using a case study of vocational training.

Finally, Laura Freina, Rosa Maria Bottino and Lucia Ferlino examine generative learning with the help of game making to train computational thinking, a competence whose importance will increase further in the future. In "Fostering Computational Thinking skills in the Last Years of Primary School" [7] the authors describe a one-year study. Among other aspects the results show that more time is needed to teach computational thinking. Thus in a follow-up project a three-year learning path is being investigated.

After the presentation of the interesting and relevant articles, we would now like to draw your attention to the next edition of the GaLA Conference, which will take place 27-29 November 2019 in Athens (https://conf.seriousgamessociety.org/). The conference will be again a great opportunity to share knowledge, opinions and ideas and advance the field of serious games. Furthermore, the conference offers various tutorials targeted to broaden and deepen knowledge of (young) researchers. Also, the conference will include an exhibition, where developers can showcase their latest products. We hope to meet you all at the GaLA Conference in Athens.

References

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