

## Editorial for EJEL, Volume 14 issue 2, following ECGBL 2015

### Guest Editor

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### Introduction

In this special edition of EJEL the focus is on the use of game construction tools, games and gamification in different learning contexts. The papers represented here are a selection of extended papers from the 9<sup>th</sup> European Conference on Games-based learning (ECGBL), held in Steinkjer, Norway at Nord University in October 2015.

There are lots of initiatives on the subjects with numerous interesting experiences to be shared. Learning by doing has for quite many years been looked upon as a vital factor for increased learning outcomes. Seen from learning theories on younger children, play is also (and has always been) a vital factor for increased motivation, stamina and learning outcomes.

Digital games and gamification are increasingly implemented in education. We see many success stories, but also many challenges, both in regards to the pedagogy and the technology. There is a need to bring the topic of digital games and education more into the teachers' educations around the world and subjects focusing on enhancing the knowledge and the skills when it comes to implementing digital games as tools for learning in pedagogical contexts needs to be further developed.

We see that many digital games, made for the purpose of learning, fail to increase motivation, stamina and learning outcomes. It is therefore also important to focus on the technological properties of the digital games to see what factors are important to enhance student's motivation and learning outcomes.

Integrating games and game development tools into educational settings is challenging and the concept challenges the entire learning environment on several aspects; The need for changes in teachers' skills and knowledge; The need for new pedagogical ways of thinking; The need for new ways of organizing the learning activities; The need for new ways of measuring learning outcomes; The need for better game play requirements for digital games for learning; The needs for new ways of rewarding; etc.

Esjing-Duun and Skovberg from Aalborg University in Denmark look at how student behavior and interactions change when teachers use "producing" as a primary pedagogical strategy in their paper: Copycat or creative innovators? Reproduction as a Pedagogical Strategy in Schools. They emphasize the importance of understanding how students explore creativity and playfulness while producing in a learning situation. Their work is based on a research project called "Children as learning designers in a digital School (2013-2015)", funded by the ministry of education in Denmark. In their research they approach creativity and playfulness as new methods for learning. They further point out the importance of skills and acknowledgement of reproducing and remixing existing materials and how playfulness is a vital predecessor for creativity to occur.

Gamifying learning activities is an interesting approach when aiming to enhance motivation, engagement, stamina and learning outcomes in education. In the paper "Climbing up the leaderboard: An empirical study of applying gamification techniques to e computer programming class", Fotaris, Mastoras, Leinfellner and Rosunally studies the effects of gamification and how you can combine a problem-based learning approach with elements of gamification for complex and traditionally "boring" subjects. They used the "Kahoot!" Classroom Response System and Codecademy's interactive platform as the bases for a learning model for an entry-level Python programming course. Even as a relatively small scale study they found that with the group of students being put through the gamified version of the course, attendance, downloading for course material and final grades were slightly better than with the control group. The paper proved that the gamified approach was both motivating and enriching for both the students and the instructors.

A more recent approach to the field of education is the approach of Game Construction as the main activity for the learning activity. Jensen, Droumeva and Fraser explores "Game Construction Pedagogy" as a vehicle for enhancing computational literacy in their paper "Exploring Media Literacy and Computational Thinking: A game maker curriculum study". Their main focus is not on playing games for learning, but on constructing games as a means for learning. Founding their ideas on Seymour Papert's constructionist learning model the authors have tested the use of the game construction software Game Maker in a pedagogical setting with 6<sup>th</sup> grade students, with the aim for increasing STEM related knowledge and skills amongst the target group. With respect to gender they find differences between boys and girls in attitudes toward computers and programming and that boys demonstrate a slightly higher confidence and performance. The paper further theorizes game construction as an educational tool, connecting it to wider STEM-oriented learning objectives in ways that can benefit both girls and boys in the classroom.

When integrating digital games into the learning context the teacher role changes, which again effects the need for new / different knowledge and pedagogical skills. In the paper "Educational games in practice: The challenges involved in conducting a game-based curriculum", Marklund and Taylor focus on the teacher's role and qualifications for implementing educational games. Based on two case studies, collaborating with K-12 teachers to use MinecraftEdu as a classroom activity for a period of 5 months, the authors identified a variety of roles that the teacher needs to take on if they are to make games a central part of a school curriculum. Taking on these roles the skills of the teachers are challenged, involving technological know-how, gaming literacy, subject matter expertise and a strong pedagogical foundation. They also outline the need for a better understanding of the context in which the games are to be used.

The paper "E-learning Sudan, Formal learning for Out-of-School children" by Stubbe et.al. is looking deeper into the use of digital games for children in Sudan that do not have to opportunity to go to school (showing that 2.3 million children in Sudan are not in school). The project designed a Math game where instruction and feedback were incorporated into the game itself. The game was tested during two Pilots, with groups of pupils with and without the assistance of teachers. The E-learning Sudan (ELS) game proved to increase mathematics knowledge acquisition in numeracy and adding significantly, and it maintained student motivation to learn. The authors also found that children in the experimental group learned more than children who received no education at all. In addition, the paper gives good insights into the many challenges of doing a project like this in Sudan.

The papers presented in this version of EJEL all focus on important topics for successful integration of digital games, gamification and game construction tools in education. While more research is still needed, these papers all gives deeper insight to the topic and many of the future challenges. Enjoy the reading of this issue.