

Introduction to the Game-based Learning Minitrack

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1. Introduction

The idea of playing is inherent to human life (Huizinga, 1956), and over the years, the games (in general) have had several applications, including their direct use in educational contexts (Tay et al., 2022). The term game-based learning (GBL) came up referring to learning and education that involves characteristics of games and play in their design, pedagogy, praxis, culture, or teacher and learner experience (Prensky, 2003). Thus, GBL is a broad field of research and practice and contains under its umbrella concepts, e.g., educational games, serious games, and gamification of learning.

Aiming to advance the literature on GBL, in 2023 we propose the realization of this minitrack, with the aim of receiving submissions on different topics related to GBL (e.g., educational games, serious games, and gamified learning). In this second edition, the papers presented in this minitrack provide us again with a series of interesting reflections. We hope that the papers presented are of interest to the community and add good reflections to the discussions on GBL.

2. Minitrack Details

After the success of the first edition (Oliveira et al., 2023), in the second edition of the Game-based learning minitrack, we initially received a total of 16 submissions. From these 16 submissions, two were transferred to correlated minitracks, as they presented topics more consistent with these other minitracks and four were desk-rejected because they were not within the conference specifications. Thus, 10 papers were sent for the anonymous peer-reviewed process. Each of these papers received at least three reviews. Afterward, the papers and reviews were further analyzed and summarized by the minitrack chairs. Of the 10 peer-reviewed papers, four were considered suitable for publication at the conference. Thus, the final acceptance rate was 40.0%.

3. Accepted Papers

The paper **Exposure, Emotion, and Empathy, A Theory Informed Approach to Misinformation and Disinformation Behavior Change through Games**, by *Lindsay Grace and Songyi Liang* provided us with valuable insights into optimizing the design of game-based educational tools aimed at enhancing player resilience to misinformation and disinformation, by analyzing them through the lens of excitation and transportation theory and recommending key characteristics for successful interventions in this behavior change domain.

The paper **Using Minecraft Education Edition to Enhance 21st Century Skills in the College Classroom: A Mixed Methods Study**, by *Sungwoong Lee, Wooyoung William Jang, and Minna Rollins* contributed new knowledge about how “Minecraft: Education Edition” can be leveraged to foster the social-emotional development of college-level students. Employing a mixed methods approach that encompassed both participant observation during gameplay and pre- and post-gameplay surveys, the study shed light on the effects of collaborative and competitive gaming experiences on the development of computational thinking and empathy in college students.

The paper **Puzzle away the Puzzledness: Action-Design Study of an Educational Escape Room for Intervention in SMEs’ Perception towards ICT Adoption**, by *Lukas Fitz, Ekaterina Veldyaeva, Lukas Teutenberg, Michaela Scheeg, and Jochen Scheeg* presented an educational escape (ER) room game as an intervention for improving informed decision-making on Information Communications Technology (ICT) adoption in small and medium-sized enterprises (SMEs), highlighting the trade-off between immersive game experiences and learning objectives while demonstrating a positive impact on participants’ perceptions of ICT within the ER, thus contributing to the field of serious games for learning in SME contexts.

The paper **Educational Burst Games - A New Approach for Improving Learner Proficiency**, by *Ashish Amresh, Vipin Verma, and Rahul Salla* provided us with insights into the use of educational burst games (EBR) as a means to enhance learner proficiency in educational games, particularly in the context of math education. It demonstrated that EBR principles can be effective in improving student learning and suggested the potential for integrating real-time game-based assessment techniques to further enhance the educational value of such games.

4. Papers Session

The papers were presented at the conference following the sequence presented next:

1. Exposure, Emotion, and Empathy, A Theory Informed Approach to Misinformation and Disinformation Behavior Change through Games
2. Using Minecraft Education Edition to Enhance 21st Century Skills in the College Classroom: A Mixed Methods Study
3. Puzzle away the Puzzledness: Action-Design Study of an Educational Escape Room for Intervention in SMEs' Perception towards ICT Adoption
4. Educational Burst Games - A New Approach for Improving Learner Proficiency

5. Challenges for the Future

In recent years, several pivotal trends and challenges evolved, which have shaped the research focus and practices of the GPL community. One of these challenges is misinformation and fake news, which have become widespread concerns, also because of the rise of (generative) artificial intelligence. In this year's version of the minitrack, we have seen papers addressing this issue, using game-based learning as a means to enhance critical thinking skills.

In the same way, the papers in this minitrack make clear the potential of both digital and analog artifacts to support learning among users. We have seen novel ways of utilizing popular digital games to enhance soft skills among students and at the same time saw that analog escape room games have great potential to enhance learning outcomes. Findings contribute to the ongoing shift in education towards becoming increasingly hybrid. We see that the field of GBL is adapting to this new reality by exploring how games can be seamlessly integrated into both physical and

digital forms. This challenge involves not only creating engaging educational games but also considering how they can facilitate meaningful interactions in diverse learning environments.

Lastly, to address the diverse and complex challenges presented by the evolving landscape of education, new ways and approaches for game-based learning were explored and contributed. One of them is educational burst games, which yielded promising results in terms of increasing learner proficiency in the context of math education. At the same time, we saw that the diverse and complex challenges in the field also materialized in a broad range of research methods used in the submissions. While both qualitative and quantitative studies have their own *raison d'être*, mixed-methods, and other innovative research methodologies are increasingly important, as they provide a potentially more comprehensive understanding of the effectiveness and implications of educational games and the underlying reasons.

In the years to come, the field of GBL is expected to invest significantly in deepening discussions around the ethical use of generative AI, addressing the spread of misinformation, adapting to hybrid learning environments, and diversifying research methodologies. These challenges represent opportunities for GBL to continue making a positive impact on education and society.

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