Editorial Preface

Patrick Felicia, Department of Computing, Waterford Institute of Technology, Cork, Ireland

Welcome to the International Journal of Game-Based Learning (IJGBL). This issue includes seven articles based on presentations featured at the 6th European Conference on Game-Based Learning (ECGBL), which was held in Cork (Ireland) on 4th and 5th October 2012. This conference brings together teachers, lecturers, students and researchers, and provides insights from different perspectives such as educational psychology, sociology, human computer interaction, artificial intelligence, game design, or instructional design.

ECGBL is a valuable platform for individuals to present their research findings, display their work in progress and discuss conceptual advances in many different areas and specialties within Game-Based Learning. This year, ECGBL featured the work of researchers from Australia, Austria, Belgium, Brazil, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Malaysia, Norway, Philippines, Russia, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, The Netherlands, UK and the USA.

With an initial submission of 159 abstracts, after the double blind peer-review process, there were 68 research papers, 4 PhD research papers and 11 work-in- progress papers featured at the conference. Amongst these excellent articles, seven outstanding papers were selected for this special issue of the International Journal of Game-Based Learning. In these articles, the authors address interesting and emergent issues such as user-centred design, collaboration in games, social presence, user behaviors and its impact on learning, time on task, and the design and evaluation of game engines for educational activities. The authors explain how educational game design can be improved, using a user-centred approach (All, Van Looy and Nuñez Castellar), and how team-based activities (Denholm, Protopsatis, and deFreitas) and social interaction (Oksanen and Hämäläinen) can improve both engagement (Marques and de Souza) and learning. The authors also look at how the perceived notion of time can influence the benefits yielded by GBL approaches (Romero and Usart), and how game authoring tools can either improve the game creation process (Mehm, Göbel, and Steinmetz) or enhance programming skills (Wilson, Hainey and Connolly).

In the first paper, authored by All, Van Looy, and Nuñez Castellar, it is envisaged how co-designed methods can enhance the design of serious games. This inspiring paper demonstrates the importance of designing from users' perspectives and providing players with game mechanics that they value. The authors

argue that game design documents for serious games should include justifications for the theoretical basis of the design choices, so that learning outcomes can be guaranteed. They explain the concept of co-design, a methodology usually employed to identify opportunities for technology- and application-oriented developments, that involves both designers and users in the early stages of the design process to ensure that users' needs and requirements are accounted for. All, Van Looy and Nuñez Castellar explain that, although co-design has been employed to some extent in game design, it has rarely been leveraged for educational games. They then describe their study, which took place in Flanders and aimed to design and develop a serious game for road safety. Their study was four-fold and featured (1) an analysis of the state-of-the-art of the gaming market in Flanders for games on traffic safety, (2) a focus group conducted with traffic safety experts to identify the cause, consequences and punishments for "problematic" behaviors, (3) interviews with traffic safety experts, and (4) the development of a game concept document, a stage that receives a greater focus in their paper. The study included 72 teenagers and a game developer who helped with the generation of ideas. The authors describe the different phases, including an ice-breaker (i.e., using a video to create a fun experience), a map task where participants developed their game concepts, and a scenario task where participants were asked to create a new game scenario. The analysis of the different tasks and outputs reveals interesting trends pertaining to the mechanics and themes featured in the game concepts created by the participants. For example, cameras, text messages, and call functions were used the most in the game concepts, and the most popular places for game play included river surroundings, parks, squares and historical buildings. The authors found that, although the children's lack of technical knowledge of mobile phone technology may

have created unrealistic expectations on their part, the co-design approach seemed to capture mechanics, themes, and places of interest to the participants. While the goal of the experiments was to help teenagers create a game on road safety, very few projects produced the expected outcome, which, to some extent, demonstrates the difficulty to find game scenarios that include a perfect balance between fun and learning activities, although the co-design approach managed to capture participants' motivations and desired features.

In the second paper, authored by Denholm, Protopsatis, and de Freitas, the authors report on the use of Team-Based Mixed Reality Games (TBMRG), games often used in higher education to teach and further explain topics, such as project or engineering management, which may require a team-based approach. The project included MSc students from Warwick University. Denholm, Protopsatis, and de Freitas argue that games (i.e., digital and non-digital) have been used from early in the century for training and educational purposes, especially for business management. They describe how well-accepted experiential learning theorists, including Kolb and Jarvis, can help to understand and support Game-Based Learning activities. They explain that simulations can be seen as experiential learning environments, and that problem-based gaming can help players to learn and construct knowledge by creating and testing hypotheses through experiments, and to assess different strategies accordingly. However, they agree that the evaluation of GBL and SG projects can pose difficulties and may need to be improved in many aspects. Their study assesses how students perceived four games on project planning, financial analysis, management of change, and product design. This article focuses on the perceived effectiveness of TBMR games. The survey conducted by Denholm, Protopsatis, and de Freitas reveals that students believed that the games enhanced their knowledge, practical skills, and motiva-

tion. It also suggests that designers should account for the value provided to the players, as it proved to be one of the most expected features, along with the feedback provided throughout the game (i.e., debriefing, peer-review, and self-reflection).

In the third article authored by Oksanen and Hämäläinen and titled "Perceived Sociability and Social Presence in a Collaborative Serious Game", the authors explore how learning occurs in games through social and collaborative interaction. They explain how Computer Supported Cooperative Work (CSCW) and Computer Supported Collaborative Learning (CSCL) can benefit learning activities, as collaborative activities help learners to assess their knowledge, share information with their peers, and promote active and social learning. The authors explain that collaborative games can be considered as a sub-category of CSCL environments. According to them, social interaction is one of the most important, yet overlooked, aspects of CSCL. As a result, Oksanen and Hämäläinen propose to study how pedagogical techniques and strategies can influence social presence, one of the three factors related to social interaction (the other two being sociability and social presence). According to Oksanen and Hämäläinen, CSCL environments need to address both participants' learning and psychological needs, including social interaction, because social and emotional processes are essential to learning. However, they also highlight that such processes require specific conditions to occur. The study described in their article analyses a collaborative game entitled *Game Bridge*, in terms of perceived levels of sociability and social presence. This multi-player game was designed to encourage and support the construction of inter-professional knowledge. The experiments conducted by Oksanen and Hämäläinen included 45 vocational training students, and 24 teachers, who played the video game for two to three hours and were then required to complete a questionnaire that evaluated sociability and social presence experienced in the game. The results showed that participants essentially experienced positive feelings, and significant correlations were found between empathy and sociability. It seemed that playing the game created strong behavioral involvement between group members, as well as strong resource dependence between them. The game seemed to develop the participants into a well-functioning team with good work relationships.

In the fourth paper titled "Behavioral Valuation of Preference for Game-Based Teaching Procedures", Marques and de Souza explore how games can motivate language learning compared to teaching methodologies only based on Experimental Behavior Analysis (EBA). They remind us that measurement of motivation can be difficult, especially when employing self-reports for children, and that it can be improved with the use of a wider range of methodologies, as correspondence between self-report and actual behaviors is often low. They argue that motivation is a result of the interaction between behavior and the environment, but that very few motivational theories account for the environmental conditions or context-specificity of behaviors, and that this may, as a result, often provide an inaccurate measure of motivation. The authors also believe that intrinsic motivation can be measured using non-intrusive techniques through the observation of participants' behaviors and choice to engage in specific tasks. The experiments described in this article included 15 pupils with reading difficulties from a Brazilian public school. The results show interesting trends, notably that the video game had a significant motivational factor which led to improved reading. Their experiments also suggest that the extent to which pupils will take and use the educational game at home depends on how much choice they have in defining their learning activities. Marques and de Souza suggest that pupils may prefer to use video games when they

don't have much choice or options in terms of educational formats, possibly because games give them a sense of control and freedom that they would not experience otherwise.

In the fifth paper, titled "An Authoring Tool for Educational Adventure Games: Concept, Game Models and Authoring Processes", Mehm, Göbel, and Steinmetz, present an authoring tool for the development of educational adventure games named *StoryTec*. They explain that, typically, educational adventure games, while being very popular and enjoyable, require considerable resources and expertise, a structure that accounts for the multidisciplinary aspects of such projects, and support for collaboration between all stakeholders. As a result, they present an authoring tool that facilitates the development of such games and collaboration between all stakeholders involved, and that adds the possibility to re-author existing games seamlessly with provision for adaptive features. Mehm, Göbel, and Steinmetz briefly describe the process of designing and developing an educational game; they review existing educational game authoring tools and describe their authoring tool, *StoryTec*, its structure, and its underlying game design model. The evaluation of *StoryTec* featured a re-authored version of the game *Geographicus* which was created and tested in terms of usability. 26 participants took part in the usability tests, which showed that *StoryTec* had no significant impact on players' mood, suggesting that correct ergonomics were applied for the design of *StoryTec*. Further interviews and focus groups also revealed that it was suitable for storyboarding and prototyping. Another part of the study compared the effectiveness of *StoryTec* to another authoring tool; it included 47 subjects who were asked to re-author a game, either using *StoryTec* or another authoring tool. The results show that *StoryTec* was preferred amongst the authoring tools, and that it helped students to complete the tasks faster. Overall, this article emphasizes the need for authoring tools to design and create educational games seamlessly; it illustrates

the challenges faced by stakeholders involved in the creation of educational games, and how some of these issues may be addressed using relevant authoring tools and techniques.

In the sixth article, authored by Romero and Usart and titled "The Impact of Students' Temporal Perspectives on Time-on-Task and Learning Performance in Game-Based-Learning", the authors focus on time-on-task and on how players' time is managed and harnessed during Game-Based Learning activities. They argue that while video games may yield higher time-on-task for users, because of their engaging features, they may not increase learning performance proportionally. Romero and Usart use the concept of Time Perspectives (TP) to profile users and to understand how their perception of time (i.e., past, present, and future events) may affect their behavior and ability to value time spent learning. Their study analyses how students with different TPs may regulate time for their learning activities, and whether individual and collaborative game performances may be related. The experiments included 24 students from an introductory course in finance who played *MetaVals*, a web-based serious game on finance. While the study revealed no correlation between TP and game performance, or between individual and collaborative activities, it suggests that TP could be important in the design of GBL activities to increase students' engagement; it also suggests that designers should consider and devise mechanisms that ensure quality time-on-task on the part of the learners.

In the seventh and last article, authored by Wilson, Hainey, and Connolly and titled "Using Scratch with Primary School Children: An Evaluation of Games constructed to Gauge Understanding of Programming Concepts", the authors examine the benefits of game construction tools in primary schools. They start by describing studies which featured and analyzed game building tools. They argue that game construction is in line with constructivists theories, whereby learners are actors of

their learning activities. In their study, Wilson, Hainey, and Connolly focus on Scratch, a game/story-telling construction software, essentially targeted at children, that makes it possible to create games relatively easily using drag and drop features and a simple interface. Their study aimed to evaluate the programming skills acquired while developing a game with Scratch, and it included 60 participants whose work (i.e., games created with Scratch) and skills were evaluated using a new coding scheme developed by the authors. This study offers one of the rare models to evaluate programming skills developed as a result of game creation, and shows that children can gain significant programming skills when while using Scratch.

I hope that you find these articles both inspiring and informative.

Patrick Felicia
Editor-in-Chief
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