

10th European Conference on Games Based Learning (ECGBL 2016)

Paisley, United Kingdom
6-7 October 2016

Volume 1 of 2

Editors:

Thomas Connolly

Liz Boyle

ISBN: 978-1-5108-3029-5

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© The Authors, (2016). All Rights Reserved.

No reproduction, copy or transmission may be made without written permission from the individual authors.

Papers have been double-blind peer reviewed before final submission to the conference. Initially, paper abstracts were read and selected by the conference panel for submission as possible papers for the conference.

Many thanks to the reviewers who helped ensure the quality of the full papers.

Printed by Curran Associates, Inc. (2016)

Published by Academic Conferences and Publishing International Ltd.
33 Wood Lane
Sonning Common RG4 9SJ UK

Phone: 441 189 724 148

Fax: 441 189 724 691

info@academic-conferences.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

Contents

Paper Title	Author(s)	Page no
Preface		viii
Biographies		ix
Research papers		
Programming Concepts in Playful Programming Products	Benjamin Brink Allsopp and Stine Ejsing-Duun	1
A Pedagogical Experiment Involving Game Design Students in Producing Non-Violence Serious Games	Julian Alvarez, Damien Djaouti and Sandy Louchart	11
Competition and Collaboration Using a Social and Gamified Online Learning Platform	Sylvester Arnab, Roy Bhakta, Sarah Kate Merry, Mike Smith, Kam Star and Michael Duncan	19
The Capacity of Games to Assess 21st Century Skills in Multiple Collaborative Environments	Nafisa Awwal, Claire Scoular and Esther Care	27
Towards a Context Agnostic Platform for Design and Assessment of Educational Games	Tyler Baron, Corey Heath and Ashish Amresh	34
Using Video Games to Develop Graduate Attributes: A Pilot Study	Matthew Barr	41
Perceptions of Turkish Primary School EFL Teachers on Digital Games	Hasan Bedir and Ali Ceyhun Muftuoglu	50
The Design and Development of the YOUTH@WORK game	Elizabeth Boyle, Graham Allan, Janet Moffett, Thomas Connolly, Joanne Lawrie, Nicholas Wilson, Hamid Oudi, Atta Badii, Sif Einarsdóttir, Hans Hummel, Aurel Graur	59
ClassCraft in the Primary School Classroom	Wayne Bretherton, Gavin Sim and Janet C Read	67
Digital Gaming: The HIV Replication Cycle and Biomedical Graduate Education	Carla Brown, Aroutis Foster, Brian Wigdahl and Sandra Urdaneta-Hartmann	75
Individualising Gamification: Investigating how Learning Styles Impact Upon Gamification	Patrick Buckley, Elaine Doyle and Ava O'Mahoney	82
Design-based Research on Conceptually Integrated Games to Foster Chemistry Skills in Secondary Education	Carsten Busch, Ludwig Dohrmann, Michael Möhlihs, Matthias Pasadu and Martin Steinicke	89
SmartProject: an Environment for Software Engineering Teaching Based on Serious Games and Social Networks	Alejandro Calderón, Mercedes Ruiz and Antonio Falcón	98
Analysis of Game of Homes' logs: A Comparison Between Scripted-Based and Automatically Generated Scenarios	Sophie Callies, Mathieu Gravel and Eric Beaudry	108
Assessing Collaborative Skills Through Games	Esther Care, Claire Scoular and Nafisa Awwal	118
Games Design as Learning Tool for Science: the Photonics Games Competition Experience	Fabio Chiarello and Maria Gabriella Castellanol	123

Paper Title	Author(s)	Page no
SimAULA: Creating Higher-Level Gamification Through Adoption of a Learning-Objective to Game-Objective Mapping Approach.	Samantha Clark, Petros Lameris and Sylvester Arnab	127
Evaluation of a 3D Simulated Practice Learning Environment	Thomas . Connolly, Stephen Farrier, Joanne Lawrie, Nick Wilson, Liz Boyle, Yaelle Chaudy, Mario Soflano, Evelyn Fitzpatrick, Nina Tsvetkova, Roberta Motiečienė, Dovile Jankunaite, Francesca Di Concetto	135
“Easy to Learn, Difficult to Master”: Accessible Front-Ends to Challenging Science Assignments	Larry Crockett	144
Video Games can Temporarily Increase Creativity; Especially Puzzle Games	William Crombie, David Moffat and Olga Shabalina	152
A Simulation for Planning and Executing a Project	John Denholm and Ian Stewart	159
Deep Design: Exploring the Role of Constructive Alignment in Game-based Learning Design	Ronald Dyer	168
Build an Educational World: Design Principles for Educational 3D Simulations	Stine Ejsing-Duun, Heidi Hautopp and Thorkild Hanghøj	176
Designing a Mobile Game for Spatial and Map Abilities of Kindergarten Children	Georgios Fessakis, Anastasia-Fevronia Bekri and Anastasia Konstantopoulou	183
Gamification in a Prototype Household Energy Game	Jan Dirk Fijnheer, Herre van Oostendorp and Remco C. Veltkamp	192
Using Game Jams as a School Transition event	Amanda Ford and Simon Kelly	202
Reconstructing Oneself Through Game-Based Learning	Aroutis Foster, Mamta Shah and Amanda Barany	208
Playful Rome: Student Game Creation as Critical Learning Practice	David Fredrick, Greg Rogers and Taylor Yust	217
A Visual Thinking Skills Training in Support of STEM Education	Laura Freina and Rosa Bottino	224
A Systematic Literature Review to Identify Empirical Evidence on the use of Computer Games in Business Education and Training	Kun Fu, Thomas Hainey and Gavin Baxter	232
A Study of the Motivations for Playing Computer Games at Secondary Education Level in Turkey: The Potential for Games-Based Learning	Kun Fu, Thomas Hainey, Gavin Baxter and Yavuz İnal	240
Giving Teachers a Toolkit for Enhancing Their use of Game-Based Learning	Wolfgang Gruber	248
Creation of GBL scenarios for multi-device environments	Stuart Hallifax, Karim Sehaba, Benoit Encelle, Jean-Charles Marty	256
Teachers’ Pedagogical Approaches to Teaching with Minecraft	Thorkild Hanghøj and Heidi Hautopp	265
The Danish Simulator: Successfully Exploring the Cost-cutting Potential of Computer Games in Language Learning	Thomas Hansen	273

Paper Title	Author(s)	Page no
Learning Systems Thinking by Using a Commercial Game	Stig Holen, Tone Vold, Ole Jørgen Ranglund, Linda Kiønig, Petter Granlien, Henrik Klevhus and Anders Klevhus	278
Using App to learn Chinese synonym and anonym	Jon-Chao Hong, Ming-Yueh Hwang, Kai-Hsin Tai, Yen-Chun Kuo	285
Meaningful Gamification for Journalism Students to Enhance Their Critical Thinking Skills	Ling-yi Huang	289
Game Design and Development as Mathematical Activities: Proposing a Framework	Erik Ottar Jensen, Thorkild Hanghøj and Morten Misfeldt	296
The Development of an Intelligent Game-Based System for Learning Sign Language with Kinect	Teerawat Kamnardsiri, Ler-on Hongsit, Pattaraporn Khuwuthyakorn and Noppon Wongta	304
Blending Formal and Informal Learning Environments: The Case of SAVE Science	Diane Jass Ketelhut and Brian Nelson	314
The Andragogical Perspectives of Older People's Interaction With Digital Game Technologies: Gameplay on Gesture and Touch-Based Platforms	Suriati Khartini Jali and Sylvester Arnab	319
Practice Makes perfect – Gamification of a Competitive Learning Experience	Antonio Kheirkhahzadeh, Christian Sauer and Panagiotis Fotaris	327
Designing a Gamified Assessment Regime: A Higher Education Case Study	Alexander Kofinas	336
Puzzle Games: A Metaphor for Computational Thinking	Bobby Law	344
How can Educators with Limited Resources Gamify Their Classes? A Design-Based Approach	Björn Lefers and Marcus Birkenkrahe	354
Usability of the Implementation of RPG-based Learning Framework	Meng Chew Leow, Lau Siong Hoe, Lillian Wang Yee Kiaw and Tan Choo Kim	364
The Investigation of Learning Effectiveness Using a Mobile-based Complex Puzzle Game: Mast Dream	Chang-Hsin Lin and Ju-Ling Shih	373
A Formal Method to Design and Evaluate Interactive Stories for Pervasive Learning Games	José Rafael López-Arcos, Jean-Charles Marty, Karim Sehaba, Francisco Luis Gutiérrez Vela	381
The Influence of Gender and Cultural Differences on the Learning Experience of Participants During a Microgame Session	Heide Lukosch ¹ , Shalini Kurapati ¹ , Daan Groen and Alexander Verbraeck	391
It Takes Three: Re-contextualizing Game-based Learning Among Teachers, Developers and Learners	Emanuela Marchetti and Andrea Valente	399
Meta Serious Game: Supporting Creativity Sessions for Mobile Serious Games	Iza Marfisi-Schottman, Pierre-Yves Gicquel and Sébastien George	407
Using Drawings as an Assessment Tool: The Impact of EcoFactory Serious Game in Primary Education	Maria Margoudi, Manuel Oliveira, Stefano Perini and Marco Taisch	416
Game-Based Learning of Musical Instruments: A Review and Recommendations	Maria Margoudi, Manuel Oliveira and George Waddell	426
Teachers' Intention to Use Educational Video Games: A Technology Acceptance Model Approach	José Martí-Parreño, Antonio Sánchez-Mena, Joaquín Aldás-Manzano	434

Paper Title	Author(s)	Page no
Who Enjoys More? Factors Related to Enjoyment in an Educational Mobile Game	Hagit Meishar-Tal and Miky Ronen	442
The Influence of Learning and Gaming Coherence on the Effectiveness of Serious Games	Philip Mildner, Oliver Beck, Marcel Reinsch and Wolfgang Effelsberg	452
Creating Opportunities to Learn Social Skills at School using Digital Games	Stefano Modafferi, Michael Boniface, Simon Crowle, Kam Star, Lee Middleton	461
Student Creativity Exercises in Designing Serious Games	David Moffat and Olga Shabalina	470
Game-based Learning as a Bedrock for Creative Learning	Peter Mozelius	479
Gaming Habits, Study Habits and Compulsive Gaming Among Digital Gaming Natives	Peter Mozelius, Thomas Westin, Mats Wiklund and Lena Norberg	486
IP-Please, Design and Development of an Educational Game on IT-Security	Peter Mozelius, Charlotte Lesley and Ola Olssonf	492
Motivating Factors and Intrinsic Integration of Knowledge in Educational Games	Peter Mozelius, Andreas Fagerström and Max Söderquist	500
Actors, Elements, and Innovative Interfaces in Game Experiences: CCAE as a Model for Analysing Game Elements	Jorge Oceja and Natalia González Fernández	509
Incorporating Game Elements Into Programming Practical Classes to Encourage Collaboration and Knowledge Sharing	Noel O'Hara and Daire O'Broin	515
Interaction, Experience, Reflection: Enhancing Project Management Training using Serious Games	Sobah Abbas Petersen and Anandasivakumar Ekambaram	521
Effective Learning through Disruption - Guidelines for Creation of Applied Game Jams and Games	Maja Pivec, Brian McDonald and Oscar Garcia-Panella	529
The Importance of Game Jams in Serious Games	Romana Ramzan and Andrew Reid	538
Using Games to Detect Positive Deviance in Crisis Training	Ole Jørgen Ranglund Tone Vold, Linda Kiøgnig Erik Bjurström Stig Holen	547
Game production: Teachers Challenges in a Danish Public School	Lars Reng and Lise Busk Kofoed	552
The Game Enhanced Learning Model: Mapping Game-based Learning for Educators	Lars Reng and Henrik Schoenau-Fog	559
Relation Between Multiple Intelligences and Game Preferences: an Evidence-Based Approach	Pejman Sajjadi, Joachim Vlieghe and Olga De Troyer	565
BioTourney: Gamifying a Biology Class by Applying a Content-Independent Learning Game Framework	Cora-Ann Schoenenberger, Safak Korkut, Janine Jaeger and Rolf Dornberger	575
A Generalised Approach to Scoring Students Collaboration in Online Game Environments	Claire Scoular, Esther Care and Nafisa Awwal	584
Game-Based Learning as a Catalyst for Creative Learning	Olga Shabalina	589
A Theoretical and Practical Framework for Facilitating Teachers to Use Game-Based Learning	Mamta Shah and Aroutis Foster	599

Paper Title	Author(s)	Page no
Multiple Regression Analysis: Refinement of the Model of Flow	Martin Sillaots and Triinu Jesmin	609
Survey for Mapping Game Elements	Martin Sillaots, Triinu Jesmin and Andrus Rinde	617
“This is a Really Funny Game”: Children Making Games for Each Other in a School Context	Helle Marie Skovbjerg	627
Designing Serious Games with the Game of Games	Ton Spil and Guido Bruinsma	634
Simulations in Project Management: Unexpected Events, Human Costs: Initiating an Autoethnographic Inquiry	Ian Stewart, John Denholm and Paul Blackwell	644
Conceptualisation and Development of Medicines Research and Development Game for Pharmacy Students	Fatima Suleman	651
Validating the Efficacy of Serious Games for Teaching and Learning	Chin Ike Tan and Choon Yee Wong	658
Conquering an Exo-planet Through the use of a Virtual Role Playing Game Assisted by an Emotionally Intelligent Pedagogical Agent	Annalisa Terracina, Francesco Fabiani, Lauren Ferro, Dario Litardi, Francesco Sapio Giuliano Zendri and Massimo Mecella	666
Improving Game Based Learning Through Formative Assessment and Iterative Development	William Thompson, Ryan Ralston, David Thomas and Scott Wilson	676
Generating Multiplayer Games for Interaction Learning using Game Design Patterns	Thomas Tregel, Christian Reuter, Stefan Göbel, Ralf Steinmetz	686
Review on Serious Games for People with Intellectual Disabilities and Autism	Stavros Tsikinas, Stelios Xinogalos and Maya Satratzemi	696
Using Games Based Learning to Support Young People With Learning Disabilities Stay Safe Online	Idong Usoro, Thomas Connolly, Sneha Raman, Tara French and Stuart Caulfield	704
From Dental Bite to Dental Bytes: Students’ Experiences of a Game-based Project	Anisa Vahed	713
Training For Crisis Using Games: Testing of Game Based Technology “In The Making”	Tone Vold, Linda Kiønig, Geir Ove Venemyr, Morten Wenstad, Petter Granlien , Anders Klevhus and Henrik Klevhus	722
The Effect of Digitizing and Gamifying Quizzing in Classrooms	Alf Inge Wang, Meng Zhu and Rune Sætre	729
The Effect of Points and Audio on Concentration, Engagement, Enjoyment, Learning, Motivation, and Classroom Dynamics Using Kahoot!	Alf Inge Wang and Andreas Lieberoth	738
Knowledge War: A Pervasive Multiplayer Role-Playing Learning Game	Alf Inge Wang, Stian Forberg, and Jon Kjetil Øye	747
Student Learning-Game Designs: Emerging Learning Trajectories	Charlotte Lærke Weitze	756
Software Components for Serious Game Development	Wim Westera, Wim van der Vegt, Kiavash Bahreini, Mihai Dascalu and Giel van Lankveld	765

Paper Title	Author(s)	Page no
Game Based Learning of Programming in Underprivileged Communities of Sri Lanka	Thomas Westin, Sirkku Männikkö-Barbutiu, Harsha Perera, Upul Anuradha	773
Community Driven Adaptation of Game Based Learning Content for Cognitive Accessibility	Thomas Westin	781
SIMSubsea: An Educational Game Combining Commercial Game-play With Contextual Mathematical Problem-solving	Marius Fjeld Wold, Lars Kristensen, Tone Røkenes, Pål Trefall and Rune Herheim	788
Examining Effectiveness of Learning Object-Oriented Programming Paradigm Through Propriety Game-Based Learning Games	Yoke Seng Wong, Maizatul Hayati binti Mohammad Yatim, Wee Hoe Tan	796
Mixed Reality Serious Games and Gamification for smart education	Paul Zikas, Vasileios Bachlitzanakis, Margarita Papaefthymiou, Steve Kateros, Stylianos Georgiou, Nikos Lydatakis, George Papagiannakis	805
PhD Research Papers		813
A Framework for Games-Based Construction Learning: A Text-Based Programming Languages Approach	André Luiz França Batista, Thomas Connolly and José Andre Peres Angotti	815
Using Gamification to Enhance Self-directed, Open Learning in Higher Education	Mark Featherstone	824
Game-Based Learning: An approach for Improving Collaborative Airport Management	Maria Freese	835
Serious Game Facilitates Conceptual Change About Molecular Emergence Through Productive Negativity (RCT)	Andrea Gauthier and Jodie Jenkinson	844
A New Game-Based Learning Approach for Learning Java on Mobile Devices	Tobias Jordine, Ying Liang and Edmund Ihler	853
Virtual Designer: Digital Role-Playing Game for Knowledge Transferal in Design Education	Li Ping Thong, Craig Stewart, Sylvester Arnab and Petros Lameris	862
Master's Research Papers		871
Applying Formal Design Methods to Serious Game Design: a Case Study	Ivo Bril and Nick Degens	873
The Effect of Gamification on Time-management in Tertiary Education	Tracey Cassells, Daire 'O Broin and Ken Power	881
Enhancing Engagement in Stress Reduction Apps Using Game Elements	Mateusz Cieslak and Daire O'Broin	888
Increasing Student Motivation and Awareness Towards Career Opportunities Through Gamification	Adam McGuire, Daire O Broin, PJ White, Colin Deevy and Ken Power	896
Conceptual Model to Incorporate Serious Games Mechanics in Intelligent Tutoring Systems	Hina Mukhtar and Aarij Mahmood Hussaan	905
Bricolage Programming and Problem Solving Ability in Young Children: An Exploratory Study	Simon Rose	914
Tri-Lua: Using Gamification as Support Learning Programming Language	Sandro José Ribeiro da Silva, Sandro José Rigo and Pablo Diehl	922

Paper Title	Author(s)	Page no
Non Academic Papers		931
Playful Learning With The Sims, for Adult Learners	Stig Andreassen and Audun Syvertsen	933
A Smartphone app for Teenagers: Ubiquitous Learning at the German Museum of Technology	Anika Kreft	939
Walk the Climate Talk	Benedict O'Donnell, Dennis Pfahl, Josef Mehling and Florence Gabriel	944
Work in Progress Papers		953
Towards a Concept on Measuring the Flow State During Gameplay of Serious Games	Daniel Atorf, Lennart Hensler and Ehm Kannegieser	955
Designing a Game-Based Mooc on a Smartphone Application: Key Challenges	Mélanie Ciussi	960
EscapED: A Framework for Creating Live-Action, Interactive Games for Higher/Further Education Learning and Soft Skills Development	Samantha Clarke, Sylvester Arnab, Luca Morini, Oliver Wood, Kate Green, Alex Masters and Aikaterini Bourazeri	968
Teachers as Game Designers Through Storytelling	Vanessa Esteve-González, Mar Camacho, Mercè Gisbert-Cervera and Julià Vicens	973
Exploring the Social Presence in 3D Virtual Learning Environments	Vanessa Esteve-González, Mercè Gisbert Cervera and Juan González Martínez	977
Teaching GIS with a Gameful Design	Toni Fisher	981
Mini Games for Professional Awareness in Introductory Psychology	Hans Hummel, Rob Nadolski, Jannes Eshuis and Aad Sloodmaker	986
Gaming in Corporate Learning Environments	Kevin Loughrey and Daire O'Broin	990
Edutainment: A New Approach to Non-formal Education Opportunities	Leila Moeeni	999
ImparApp: Designing and Piloting a Game-Based Approach for Language Learning	Luca Morini, Koula Charitonos, Sylvester Arnab, Tiziana Cervi Wilson, Billy Brick, Tyrone Bellamy-Wood and Gaetan Van Leeuwen	1005
Knowledge Formation and Inter-Game Transfer With Classical and Quantum Physics	Mads Kock Pedersen, Camilla Clement Borre, Andreas Lieberoth, and Jacob Sherson	1010
Games Based Learning in Polish Libraries: State of Research and Good Practices	Magdalena Wójcik	1014