

17th European Conference on Games Based Learning (ECGBL 2023)

Enschede, Netherlands
5 – 6 October 2023

Editors:

**Ton Spil
Guido Bruinsma
Luuk Collou**

ISBN: 978-1-7138-8047-9

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, (2023). All Rights Reserved. No reproduction, copy or transmission may be made without written permission from the individual authors.

Printed with permission by Curran Associates, Inc. (2024)

Review Process

Papers submitted to this conference have been double-blind peer reviewed before final acceptance to the conference. Initially, abstracts were reviewed for relevance and accessibility and successful authors were invited to submit full papers. Many thanks to the reviewers who helped ensure the quality of all the submissions.

Ethics and Publication Malpractice Policy

ACPIL adheres to a strict ethics and publication malpractice policy for all publications – details of which can be found here:

<http://www.academic-conferences.org/policies/ethics-policy-for-publishing-in-the-conference-proceedings-of-academicconferences-and-publishing-international-limited/>

Conference Proceedings

The Conference Proceedings is a book published with an ISBN and ISSN. The proceedings have been submitted to a number of accreditation, citation and indexing bodies including Thomson ISI Web of Science and Elsevier Scopus.

Author affiliation details in these proceedings have been reproduced as supplied by the authors themselves.

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

Preface	iv
Committee	v
Biographies	vii
Academic Papers	
<i>Discovering Educational Game Design Through ‘Conversation Starters’: Teachers’ and Game Designers’ Perspectives</i> Mifrah Ahmad	1-12
<i>Integrating Reinforcement AI into the Design of Educational Games</i> Ashish Amresh	13-18
<i>The need for game-based learning methods to address cyber threats</i> George Andrews, Chitra Balakrishna, Alexander Mikroyannidis	19-28
<i>Media Convergence and Game-Based Learning: Developing a Hypothesis of Film Education for the Post-Media Age</i> Massimo Atzori	29-37
<i>UnlockArt: Cultural Mediation at the Museum Through an Augmented Reality Escape Room</i> Masiar Babazadeh	38-45
<i>A Model for Balancing Clarity and Appeal in Serious Game Visuals</i> Hua Bai, Björn Berg Marklund, Ulf Wilhelmsson	46-52
<i>Informal Game Play in the Classroom: Utilisation and Integration of the Metalanguage of Games</i> Kim Balnaves	53-59
<i>Designing a 3D Serious Game about Career Pathways in the Games Industry</i> Gavin Baxter, Thomas Hainey, Alan Williams, Julie Black	60-68
<i>Vocabulary Acquisition in New and Learned Contexts Using Immersive Virtual Reality</i> Thérèse Bergsma, Marië Theune, Robby van Delden	69-77
<i>Maestro Martino: designing a historic escape room with primary school children</i> Luca Botturi	78-85
<i>Design Experiments in Game-Based Learning of Metacognition</i> Elco Braad, Nick Degens, Wijnand IJsselsteijn, Wolmet Barendregt	86-93
<i>Entrepreneurship and game-based learning in Higher Education: a systematic review</i> Margarida Casau, Marta Ferreira Dias, Marlene Amorim	94-101
<i>The Language of Life: A Game-Based Workshop for Introducing Protein Biosynthesis</i> Fabio Chiarello, Daniela Fioretti, Tiziano Antognozzi, Francesca Romana Bertani, Ennio Bilancini, Matteo Bisanti, Leonardo Boncinelli, Luca Businaro, Roberto Di Paolo, Annamaria Gerardino, Sandra Iurescia	101-107
<i>Applying design research for cross-disciplinary collaboration: Experiences from a gamification process</i> Younjung Choi, Cornelis Willem Klok, Sharif Khaleghparast, Swapnil Shekhar	108-116

<i>A Simulation Game for Anti-money Laundering (AML) Using Unity</i> Long Kiu Chu, Sui Leung Fung	117-126
<i>When design gets in the way: student learning and digital escape game</i> Caroline Cruaud	127-134
<i>Design of an Educational Escape Room by Future Teachers</i> Dr. Mária Čujdiková, Dr. Peter Vankúš	135-143
<i>Microgames and Language Learning: Performance Before Competence?</i> Suzanne de Castell, Nora Perry, Lorea Bailey, Jen Jenson	143-153
<i>Science4Exit Project - Experimental Escape Games with Digital Enrichment in an Extracurricular Learning Venue</i> David Ditter, Isabel Rubner, Sarah Lukas, David Weiser	154-161
<i>Exploring Movement-Modifier Facilitation in Movement-based Sports, Health, and Game Design</i> Lars Elbæk, Rasmus Vestergaard Andersen, Lærke Schjødt Rasmussen	162-170
<i>Using and facilitating social videogames as warm-ups for embodied design</i> Jose Font, Mats Johnsson, Søren Lekbo, Rasmus Vestergaard Andersen, Maximus D. Kaos, Lars Elbæk	171-179
<i>Designing Educational Escape Rooms with Generative AI: A Framework and ChatGPT Prompt Engineering Guide</i> Panagiotis Fotaris, Theodoros Mastoras, Petros Lameris	180-189
<i>Teaching GBL Principles to Japanese Students of Education in an EFL Setting</i> Andrew Gallacher, Stephen Case, Jay Palarino	190-198
<i>Literature Review for the Design Methods of Serious Games</i> Ianlangao Gao	199-208
<i>Game design as reflective pedagogy in entrepreneurship education</i> Wilian Gatti Junior, Beaumie Kim, Laleh Behjat, Emily Marasco, Marjan Eggermont	209-219
<i>Computer Games as a Pedagogical Tool for Creating Cyber Security Awareness</i> Per Arne Godejord, Beata Godejord	220-224
<i>Development of a 3D Immersive Game for Games and Systems Requirements Capture</i> Thomas Hailey	225-233
<i>Students as educational board game designers: Learning opportunities and design dilemmas</i> Thorkild Hanghøj	234-241
<i>Facilitating an Educational Board Game Jam: Analysing Different Game Design Strategies</i> Heidi Hautopp, Thorkild Hanghøj, Vici Daphne Händel, Anders Simmelkiær Laraignou, Erik Ottar Jensen, Peter Gundersen	242-250
<i>Enter the Paraverse: Challenging Assumptions of Live Music in the Metaverse</i> Pat Healy, Hannah Standiford	251-259
<i>Unpacking student perceptions of board game mechanics</i> Suzaan Hughes	260-268
<i>Need-Based Game Design: Developing a CT Game Based on Educational Needs</i> Niklas Humble, Peter Mozelius, Lisa Sällvin	269-277

<i>PIXEL: Challenges of Designing a Professional Board Game for Astronomy Education</i> Giannandrea Inchingolo, Rachele Toniolo, Stefania Varano, Andrea Ligabue, Sara Ricciardi	278-288
<i>Enhancing Mathematical Reasoning in Primary School with the Strategic Board Game Othello</i> Erik Ottar Jensen, Emilie Madeline Hersaa Nehammer, Anna Louise Eriksen	289-295
<i>Researching Game-Based Learning: A Brief Synthesis Project</i> Jenifer Jenson, Suzanne de Castell	296-302
<i>Assessing Creative Awareness and Literary Writing Games in the Norwegian Context</i> Allen Jones	303-311
<i>Implementation of Game-Based Learning in a Tertiary General Education Course</i> Kai Ming Kiang, David Koo	312-318
<i>The Effects of Gamifying Mathematics Lessons at High School Level</i> Michael Kickmeier-Rust, Corsin Niggli	319-326
<i>Evaluating the Impact of Serious Games on Study Skills and Habits</i> Kiron, Mehnuma, Dr Julita	326-335
<i>First Steps to Improve Cybersecurity Behaviour – a Virtual Reality Experience</i> Lara Klooster, Robby van Delden, Jan-Willem Bullée	336-343
<i>An Eye-Tracking Study of GBL Motivators and Learner Behavior</i> Maria Koutroumani, Stefanos Balaskas, Angeliki Leonardou, Maria Rigou	344-350
<i>The Race to Nuclear Supremacy: Classroom Games as Motivation for Student Learning</i> ELSA CATALINA OLIVAS CASTELLANOS, Abraham Ramsés Velázquez Kraff, David Alejandro Duarte Moroyoqui	351-360
<i>Turning Grey to Green: Engaging Gamification in Sustainability Education with Augmented Reality Technology</i> Matt Ma, Michel Dik, Walter Fung	361-370
<i>Guidelines for Playful Learning Design in VR/AR: Insights from Student Productions</i> Gunver Majaard, Patricia Lyk	371-380
<i>Sandwich Robot for Computational Thinking: Reflections from testing with high school pupils</i> Emanuela Marchetti, Andrea Valente, Nina Bonderup Dohn	381-389
<i>Kuxtal: Student Motivation Through Megagames in Higher Education Design Students</i> Edgar Ludert, Elsa Catalina Olivas Castellanos, Leticia Isabel Ramírez-Cavazos	390-400
<i>History and Cartography meet youth through Digital Technology</i> Educator, Educator, Educator, Student, Student; Student	401-410
<i>Design and development of a gamified tutorial for iVR serious games</i> Ines Miguel-Alonso, Henar Guillen-Sanz, Bruno Rodriguez-Garcia, Andres Bustillo	411-417
<i>Could the Technology for Adaptive Learning Systems Come out of GBL?</i> David Moffat, Olga Shabalina, Aleksander Khairov	418-425
<i>Enhancing Pre-Schoolers' Learning Motivation in Jawi Subject Through Game-Based Learning Application</i> Noor Asmina Mohd Rashid, Norah Md Noor	426-434

<i>Development of an Enjoyable Educational Game on Fundamental Programming: Designing for Inclusion and Learning Analytics</i> Peter Mozelius	434-442
<i>A Conflict Management Game in Project-based Learning</i> Robin Isfold Munkvold, Line Kolås, Adam Palmquist	443-451
<i>Games-Based Learning in Business Management Programmes – a Reflective Analysis of Students’ Experience.</i> Nurun Nahar	452-458
<i>Collect that Coin: Efficacy Testing of Platformer Game Mechanics with Adult Learners</i> Danielle Oprean, Hillary Gould, Nathan Riedel, Soren Larsen	459-466
<i>Exploring In-Game Scaffolds for Higher-Order Learning in a Case-Based RPG Learning Game</i> Danielle Oprean, Declan Brown, Nate McGorry, Blake Pieper, Nicholas Rankin, Soren Larsen	467-474
<i>Proposal for a Participatory Methodology for the Creation of Serious Games</i> Ernesto Pacheco-Velazquez, Andre Bester, Lucia Rabago-Mayer, Virginia Rodes-Paragarino	475-481
<i>What do we evaluate in serious games? A systematic review</i> Ernesto Pacheco-Velazquez, Andre Bester, Lucia Rabago-Mayer, Virginia Ro	482-489
<i>Using an Escape Room activity to Enhance the Motivation of Undergraduate Life Science Students in Mathematics Classes - A Case Study</i> Sónia Pais, Ana Elisa Sousa, Ana Pires	490-496
<i>Requirements and Learning Modules for Implementing a Hologram Table in University Lectures</i> Bruna Pereira de Souza, Johannes Zysk, Samira Khodaei, Maximilian Weber, Anas Abdelrazeq, Dennis Kreutzer, Ingrid Isenhardt, Bernd Georg Lottermoser	497-504
<i>Ingenious Game: Insights Into Evolving From a Learning Card Game to a Learning Software Application Game</i> Marcus Vinicius Pereira Pessoa	505-514
<i>Number Express: a Digital Game to Improve Early Numeracy</i> Nicoletta Perini, Annamaria Porru, Korbinian Moeller, Tim Jay, Francesco Sella	515-522
<i>Evaluating the Efficacy of a Serious Game in Enhancing Word Reading Speed</i> Chiara Piazzalunga, Linda Greta Dui, Stefania Fontolan, Sandro Franceschini, Marisa Bortolozzo, Cristiano Termine, Simona Ferrante	523-530
<i>“A Slave Obeys”: Capital Violence and Illusory Agency in BioShock</i> David Prihoda	531-538
<i>Confidence in Movement-Based Game Design Facilitation: Learning From a Novice Design Facilitator</i> Lærke Schjødt Rasmussen, Philip Wolfgang, Maximus Kaos, Lars Elbæk	539-548
<i>A Video Game to Teach Young Adults the Brain Basics of Addiction</i> Andrés Felipe Reyes	549-555
<i>Using In-game Analytics to Explore Learning Dynamics of Information Literacy in a Social Media Simulator</i> Xavier Rubio-Campillo, Celia Corral-Vázquez, Kevin Marín-Rubio	556-563
<i>A 3 roles’ model to better design and facilitate the use of serious games in the classroom</i> VALERIE SALLAZ, Thibaut CARRON	564-573

<i>Exploring Reflective Learning in Digital Game-Based Learning: A User Research</i> Anjuman Shaheen, Panagiotis Fotaris	574-582
<i>Making Legislative Process Understandable: Survey of Parliaments' Serious Games of European Countries</i> Martin Sillaots, Mikhail Fiadotau	583-591
<i>Introducing Game Jams for Ecology and Citizenship Education in High School Classes</i> Luana Silveri	592-598
<i>The Dark Side of Fun: Understanding Dark Patterns and Literacy Needs in Early Childhood Mobile Gaming</i> Carla Sousa, Ana Oliveira	599-610
<i>Barriers and Hindrances to the Effective Use of Games in Education: Systematic Literature Review and Intervention Strategies</i> Carla Sousa, Pedro Neves, Filipe Luz	611-620
<i>Mathematics and Sign Language Learning with a Tangible Game: An Inclusive Approach for DHH and Hearing Children</i> Cátia Casimiro, José Carlos Neves, Carla Sousa	621-631
<i>The Novelty of Collaboration: High School Students Learning and Enjoyment Perceptions When Playing Cooperative Modern Board Games</i> Micael Sousa, Carla Sousa, Filipe Luz	632-642
<i>Chances and Limitations of Immersive Augmented Reality for Game-based Learning in Museums</i> Ulrike Spierling, Jessica L. Bitter, Yu Liu, Thorolf Müller	643-650
<i>Work, Costs and the Unexpected in the academic's creation and use of Games and Simulations in Teaching and Learning</i> Ian Stewart, Kun Wang	651-657
<i>Evaluating Playful Creative Problem Solving in Kyiv and Ukrainian Refugees in France</i> Oksana Strutynska, Margarida Romero	658-665
<i>Sense-making of Digital Game Technologies (DGT): Positive Instances of Children-led Engagement with Chess</i> Malola Prasath Thittanimuttam Sundaramadhavan, Luis Blasco De la Cruz, Astrid Barbier, Dr Mustafa, Tamer Karatekin, Muthukumar Narayan, Sharon Whatley, Mr Humberto, Bayaraa Delgerzaya	666-673
<i>From research to prototypes: Developing a digital game to foster fraction equivalence.</i> Georgios Thoma, Julia Bahnmueller, Manuel Ninaus, Korbinian Moeller	674-682
<i>Values-based Transformative Games: From the Physical to the Digital</i> Khushbu Tilwawala, Michael Myers, Ton Spil, David Sundaram	683-692
<i>Educational Story-Based Game for Capturing the Learner's Personality</i> Athanasios Tsionas, Maya Satratzemi	693-699
<i>Fostering Employability Skills for Engineers with Serious Games: A gamified GBL concept</i> Paul Varney, Vanessa Mai, Dr. Valerie Varney	700-705
<i>Utilizing outdoor quiz game in secondary school teachers' perceptions of usefulness</i> Tone Vold, Linda V. Kjønig, Souad Slyman	706-711
<i>Digital Educational Escape Rooms for Social Entrepreneurship: Identifying Design Choices for Educational Impact</i> Kristin Webb, Richard Martina	712-720

<i>Multiplayer Serious Games Supporting Programming Learning</i> Adam Wynn, Jingyun Wang, Ruisheng Han, Ting-Chia Hsu	721-729
<i>Exploring the Effects of Progression Mechanics in Competitive and Collaborative Gamified Learning</i> Dongjie Xu, Janet Read, Julie Allen	730-738
<i>On Supporting Game-based Learning via Recommendations</i> Aytuna Yamaç, Mehmet Yamaç, Kostas Stefanidis	739-746
PhD Papers	
<i>Games as Socio-Technical Systems Interdisciplinary Infrastructure for a Pedagogy of Play</i> Diego Alatorre Guzmán	748-755
<i>Using RPG-Based Learning Environment to Increase Engagement and Motivation for Learning Higher Mathematics</i> Evgenia Anagnostopoulou	756-764
<i>SwageXR: Designing Gamified AR Applications for Industrial Training</i> Luke Beveridge, Keshav Dahal, Marco Gilardi	765-773
<i>Introducing Resource Management Into a Large-Scale Cyber Security Seminar Game: A Case Study</i> Peadar Callaghan	774-781
<i>Overcoming Social Anxiety: How Virtual Reality and Game-Based Elements are Revolutionizing Patient Therapy.</i> Asge Matthiesen, Gunver Majgaard, Lasse Juel Larsen	782-788
<i>The Design, Implementation and Evaluation of Gamified Immersive Virtual Reality (IVR) for Learning: A Review of Empirical Studies</i> Wenting Sun, Qihui Chen	789-797
Masters papers	
<i>A Proposed Framework for the Classification of Game-Based Learning in Construction Management</i> Yara Elenany, Vian Ahmed	799-806
<i>Meraki: Encouraging Language Learning in Real-World Simulations through AI Para-Social Relationship Building</i> Subhangi Namburi, Gail Hopkins	807-816
<i>Color Blindness in the Digital Gaming Landscape: Addressing Critical Issues and Research Gaps</i> Merve Tillem, Assistant Professor Dr	817-825
<i>Combine DGBL with AI system: A Technical Guidance to Reduce Teacher's Burden in Digital Game-based Learning</i> yue lei, liang guo	826-831
Work in Progress	
<i>Science4Exitschool: Escape Games for Chemistry Classes</i> Rebekka Hesser, Isabel Rubner, Sarah Lukas	833-835
<i>Tierschutz erleben. Devising a "Comic Automaton" to Innovate Learning</i> Jana Kalb, Prof. Dr.-Ing. Ido Iurgel, Anabela Parente, Prof. Dr. Steffi Wiedemann	836-840
<i>Virtual Chemistry Exam Preparations Designed as Escape Rooms</i> Michaela Kröppl, Georg Yvon	841-846

<i>Serious Game For Training To Escape From Disasters And Deal With Accidents</i> Yantao Meng	847-851
<i>Challenges in Designing a Game for the Prevention of Intimate Partner Violence</i> Lorena Müller, Ulrike Spierling, Jessica L. Bitter, Stephan Schwarz	852-855
<i>Fostering Self-regulation, Motivation, and Creativity through Gamification Software iWrite</i> Christian Stein, Skylor Zhang	856-860
Late Submissions	
Designing GBL for Higher Education: Pitfalls & Recommendations Vanessa Camilleri	869-875
Experimenting with GAME OVER to create processes of reflection and academic inquiry Camilla jensen, Susanne Dau	876-886
The Application of Games to Engage Citizens in Climate Change Policy Development Paul Hollins	887-895
Teaching with business simulation games: Identifying and overcoming hurdles to adoption. Tim Rogmans	896-903
Investigating Inclusivity in Game-Based Learning: Current Practices and Multistakeholder Perspectives Sara Rye, Carla Sousa	904-911
A Video Game to Help the Fight Against the Vicious Tapeworm in Africa Chiara Trevisan, Merel Joris , Feyza Ercos, Kabemba Evans Mwape, Sarah Gabriël	912-922
Classroom Introduction of a Video Game on Italian Grammar Massimiliano Andreoletti	923-931