AALBORG UNIVERSITY
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Designing Serious Games for Computer Assisted Language Learning

Teacher/learner perspectives and user-centered design

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2nd European Conference on Games Based Learning

Hosted by the
The Univesitat Oberta de Catalunya
Spain
16-17 October 2008

Edited by
Thomas Connolly and Mark Stansfield
University of West of Scotland
Paisley
UK

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.

Further copies of this book and previous year's proceedings can be purchased from http://academic-conferences.org/2-proceedings.htm

ECGBL 2008

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Preface

This year is the 2nd European Conference on Games-Based Learning, which is being hosted by The Universitat Oberta de Catalunya, Barcelona, Spain. The Conference Co Chairs are Jordi Sánchez Navarro and Daniel Aranda, both from the Universitat Oberta de Catalunya, and the Programme Co Chairs are Thomas Connolly and Mark Stansfield, both from University of the West of Scotland, UK.

The conference will be opened with a keynote from Simon Egenfeldt-Nielsen, IT-University of Copenhagen, Denmark, on the topic of *Beyond Edutainment: The educational potential of computer games*. The second day will be opened with a presentation from Ben Sawyer, Co-Founder, Digitalmill, Portland, Maine, USA.

The main purpose of the Conference is for individuals to present their research findings, work in progress and conceptual advances in many different branches of games-based learning as well as to come together to share knowledge with peers interested in the same area of study. The papers included in these proceedings is clear evidence that the conference has moved forward since its inception last year.

A key aim of the conference is about sharing ideas and meeting the people who hold them. The range of papers will ensure an interesting two days.

With an initial submission of 109 abstracts, after the double blind, peer review processes there are 62 papers published in these Conference Proceedings. These papers represent research from Australia, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Iran, Ireland, Italy, Netherlands, Pakistan, Portugal, Serbia, South Africa, South Korea, Spain, Switzerland, Turkey, UK and the USA.

We hope that you have an enjoyable conference.

<div align="center">

Prof Thomas Conolly   Dr Mark Stansfield
Conference Chair   Programme Chair
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Conference Executive:

Dr Wilfried Admiraal, University of Amsterdam, The Netherlands
Dr Daniel Aranda, Univesitat Oberta de Catalunya, Spain
Dr Tobias Bevc, Political Science, Technical University of Munich
Dr Erik Champion, University of New South Wales, Australia
Professor Thomas M Connolly, University of the West of Scotland, UK
Dr David Edgar, Glasgow Caledonian University, UK
Kevin Grant, Glasgow Caledonian University, UK
Dr. Begoña Gros, Univesitat Oberta de Catalunya, Spain
Dr Jeff Haywood, University of Edinburgh, UK
Dr Kristian Kiili, Tampere University of Technology, Pori, Finland
Professor Feng Li, University of Newcastle Upon Tyne, UK
Dr Hamish MacLeod, University of Edinburgh, UK
Dr Jordi Sánchez Navarro, Univesitat Oberta de Catalunya, Spain
Dr Mark Stansfield, University of the West of Scotland, UK
John Sutherland, University of Abertay, UK

Conference Committee:
The conference programme committee consists of key people in the games based learning community, both from the UK and overseas. The following people have confirmed their participation:

Wilfried Admiraal (Universiteit van Amsterdam, Netherlands); Samad Ahmadi (University of De Montfort, Leicester, UK); Daniel Aranda (Univesitat Oberta de Catalunya, Spain); Tobias Bevc (Technische Universität, München, Germany); John Biggam (Glasgow Caledonian University, UK); Patrick Blum (Inside Business Group, Germany); Liz Boyle (Univesity of the West of Scotland, UK); Willem-Paul Brinkman (Delft University of Technology, Netherlands); David Brown (Nottingham Trent University, UK); Daniel Burgos (Open University of The Netherland, Heerlen, Netherlands); Thibault Carron (Université de Savoie, Chambéry, France); Erik Champion (Massey University, New Zealand); Maiga Chang (National Science and Technology Programme for e-Learning, Chung-Li, Taiwan); Nathalie Charlier (Catholic University of Leuven, Belgium); Thomas Connolly (University of the West of Scotland, UK); David Edgar (Glasgow Caledonian University, UK); Patrick Felicia (Waterford Institute of Technology, Ireland); Sara De Freitas (Birkbeck College (University of London, UK); Pedro Antonio González-Calero (Complutense University of Madrid, Spain); Kevin Grant (Glasgow Caledonian University, UK); Begoña Gros (Univesitat Oberta de Catalunya, Spain); David Guralnick (Kaleidoscope Learning, New York, USA); Mike Hart (University of Winchester, UK); Dr Jeff Haywood (University of Edinburgh, UK); Stefan Hrastinski (Uppsala University, Sweden); Rozhan Idrus (Universiti Sains Malaysia, Malaysia); Jeffrey Jacobson (Carnegie Museum of Natural History, Pittsburgh, USA); Runa Jesmin (Kings College London, UK); Michail Kalogiannakis University Paris 5 Rene Descartes, France); Elisabeth Katzlinger (Johannes Kepler University, Linz, Austria) Kristian Kiili (Tampere University of Technology, Pori, Finland); Feng Li (University of Newcastle upon Tyne, UK); Martin Lynch University of Glamorgen, UK); Hamish Macleod (University of Edinburgh, UK); Stephanos Mavromoustakos (European University Cyprus); Jean-Charles Marty (Université de Savoie, Chambéry, France); Alice Mitchell (Anglia Ruskin University, Cambridge, UK); Jonathan Moizer (University of Plymouth, UK); Paul Peachey (University of Glamorgan, Treforest, UK); Elias Pimenidis (University of East London, UK); Selwyn Piramuthu (University of Florida, Gainesville, USA); Daniela Romano (University of Sheffield, UK); David Rush (University of Winchester, UK); Florin Salajan (University of Toronto, Canada); Jordi Sánchez Navarro (Univesitat Oberta de Catalunya, Spain); Elsebeth Sorensen (Aarhus University,Denmark); Mark Stansfield (University of West of Scotland, UK); Constance Steinkuehler (University of Wisconsin-Madison, USA); John Sutherland (University of Abertay, UK); Timo Lainema (University of Turku, Finland); Uday Trivedi (R.C. Technical Institute, India); Richard Tunstall (University of Glamorgan, UK); Linda Van Ryneveld (Tshwane University of Technology, Pretoria, South Africa); Nicola Whitton (Manchester Metropolitan University, UK); Dorathy Williams (Robert Gordon University, UK)

Biographies of Conference Chairs, Programme Chair and Keynote Speaker

Conference Chairs

Jordi Sánchez-Navarro is a lecturer at the Information and Communication Sciences Department at the Open University of Catalonia, where he coordinates and teaches on screen studies, interactive narratives and digital publishing. He has taught at the Universitat Ramon Llull, and collaborated in several masters at the Universitat Autònoma of Barcelona and the School of Cinema and Audiovisuals of Catalonia (ESCAC). He achieved a PhD in Film Studies (Universitat Ramon Llull) with a dissertation about the concepts of authorship, crisis of the genres and cultural recycling in post-modern media. At present, his research interests are screen studies, current film practices in contemporary media landscape, video games, animation, children and youth media education in leisure time and rethinking media. He is currently involved in a project which is researching into how video games work as educational tools, and in the formal aspects of video games, approaching both issues to the more general field of screen studies. Among other activities, he collaborates with the research groups SPIDER (Smarter People through Interactive Digital Entertainment Resources) and COMCAD (Audiovisual Communication and Digital Culture). Both groups have commissioned or funded by public institutions research in progress.

Daniel Aranda is a Lecturer responsible for the area of Theory and Sociology of Communication at the Open University of Catalonia (Universitat Oberta de Catalunya). He has achieved a PhD in Media Studies (University Ramon Llull) and a Master in Education and Communication (Universidad Autónoma de Barcelona). He is also the Coordinator of a research group called COMCAD (Open University of Catalonia) which investigates the context of digital media creation (integration and legitimization of digital art and Digital aesthetics) and the use and consumption of technologies related to digital leisure: p2P networks, phone culture and video games (**http://spider-uoc.blogspot.com/**). He is currently involved in a project which is researching into how video games work as educational tools; the formal aspects of video games, but also, and fundamentally, their use and application by children and youth in leisure settings managed by non-formal education bodies, such as leisure associations for young people.

Programme Chairs

Thomas Connolly is a Professor in the School of Computing at the University of the West of Scotland, having managed the Department of Computing and Information Systems for several years. Thomas worked for over 15 years in industry as a Manager and Technical Director in international software houses before entering academia. His specialisms are games-based learning, online learning and database systems. He has developed three fully online MSc programmes and developed and leads the undergraduate BSc Computer Games Technology programme. He is co-author of the highly successful academic textbooks Database Systems (now in its 4th edition) and Database Solutions (in its 2nd edition). He is a reviewer for several international journals and has been on the committee for various international conferences. He is a member of CPHC (Council of Professors and Heads of Computing) and member of the Higher Education Academy.

Mark Stansfield is a Senior Lecturer in the School of Computing at the University of the West of Scotland. He has a PhD in Information Systems and has written and co-written more than 70 refereed papers in areas relating to e-Learning, games-based e-Learning, information systems and e-Business. Journals in which papers have been published include the European Journal of Information Systems, Systems Practice and Action Research, the Journal of Further and Higher Education, the Journal of Electronic Commerce Research, the Journal of IT Education, and Computers and Education. Mark also serves on the editorial boards of several international journals that include the International Journal of Information Management, Journal of Information Systems Education, ALT-J and the Journal of IT Education. Mark was appointed Member of the International Association of Science and Technology for Development (IASTED) Technical Committee on Education for the term 2005-

2008 and is a Registered Practitioner of the Higher Education Academy in the UK. He has presented papers at international conferences for over 15 years and has won Best Paper Awards at a number of conferences that include the UK Systems Society Conference in 1993 and the Informing Science and IT Education Conferences in 2003 and 2006

Keynote Speakers

Simon Egenfeldt-Nielsen (PhD, Psychologist) is currently an assistant professor at the IT-University of Copenhagen. He researchers the educational potential of computer games, but has during the last 10 years covered a wide area of game research. He is also CEO of Serious Games Interactive that is recognized as a world leader in the development of educational computer games. Earlier he worked in the industry with online games, learning, entertainment, children, and web applications. He has served on the Digital Game Research Association Board for 3 years, edited the Ivory tower column for 2 years, and has served as a reviewer for several journals, research projects and conferences within game research. He is a founding member of Centre for Video games Research Copenhagen, co-founder of Game-research.com, and has authored four books covering the topics video games, education and learning.

Ben Sawyer is the co-founder of Digitalmill, Ben Sawyer is in charge of strategy, technology, and business development and is the producer of Virtual U, a million dollar plus foundation funded project to build a university management simulator. Virtual U, now shipping Version 2.1, was a 2000 Independent Games Festival finalist. Ben is also the author of Serious Games: Improving Public Policy through Game-Based Learning and Simulation Whitepaper for the Woodrow Wilson International Center for Scholars (wwics.si.edu) and was a contributor to Game Developer Magazine. He is author of two books on gaming for Coriolis Group Books and is developing a book on simulations with Paraglyph Press. He has published several research reports on the games industry for DFC Intelligence

Biographies of contributing authors (in alphabetical order)

Michael Avery is Senior Product Manager, Global Education for Sibelius Software - a Part of Avid. Originally from Wellington, New Zealand, he is now based in London, UK. He has worked in the field of educational software design for music for over 10 years, and has produced over 7 software titles for use at a variety of levels. Many titles have won education industry awards including Groovy Music (WorldDidac winner), Switzerland 2006), Sibelius Compass (Winner, BETT UK, 2005), Sibelius Instruments (Parent's choice, USA, 2005) and Inotes (TUANZ, New Zealand, 1998).He produces Jazz records in his spare time.

Youngkyun Baek has been teaching at Korea National University of Education since 1991. He has presented several papers at SITE and NECC on gaming and simulations. He published two books on educational games and wrote two books chapters: "Design of an adaptive mobile learning management system based on student learning styles" in Handbook of Research on User Interface Design and Evaluation For Mobile Technology; "Revealing New Hidden Curriculum of Digital Games" in Handbook of Research on Effective Electronic Gaming in Education (IGI Global). He is co-author of the book (in press) entitled "Digital Simulations for Improving Education: Learning Through Artificial Teaching Environments" by IGI Global.

Roberto Barchino has a Computer Sciences Engineering degree by Polytechnics University of Madrid and Ph.D. from University of Alcala. Currently, he is Associate Professor in the Computer Science Department of the University of Alcalá and Tutor Professor in the Open University of Spain (UNED). He has been invited to "Dipartimento di Informatica e Automatica", University of Rome Tre, Rome, Italy, for five months. He is author or co-author of more than 60 scientific works (books, articles, papers and research projects), some of them directly related to Learning Technology. He is also member of the group for the standardization of Learning Technology in the Spanish Official Body for Standardization (AENOR).

Ricardo Jose Vieira Baptista has a degree in Engineering Computer Systems and the University of Madeira and master in the Multimedia Technologies FEUP. Currently, is professor of secondary education of the School of APEL (Madeira island). Ended the draft Master's thesis, Role Play Games (RPGs) - a strategy in the context education, which sought to use the games of computers as a tool for learning multidisciplinary, through an RPG on the commemoration the 500 years of lifting the city of Funchal.

Natasha Boskic is pursuing her Ph.D. in Language and Literacy Education at the University of British Columbia (UBC), Vancouver, Canada. The focus of her research is the intersections of gaming and literacy. She is interested in the form of textuality that is specific to these narrative spaces, and the ways students engage with them. Natasha works as an Educational Technology Manager in the Faculty of Education at UBC.

Marcelino Cabrera Cuevas: Lecturer in the Software Engineering Department and Research Member of GEDES Software Research Group, University of Granada, Spain. He is specialized in software adaptation/personalization techniques using videogames to readapt the educational contents with the user profile. He has collaborated with Nintendo Spain in different studies about the real impact of videogames in the mental training.

Nathalie Charlier is a lecturer in the Teacher training programme in health education at the University of Leuven, Belgium. She obtained a BSc and MSc in Pharmaceutical Sciences in 1999 and her PhD in Medical Sciences in 2003. Her current research interest is the use of technology in health education.

Sibel Çoban. Her graduations (master and PhD) in the Marmara University. She is a lecturer in the Marmara University Atatürk Education Faculty, Fine Arts Educational Department Music Teachers' Main Scientific Branch. The essential purpose of the Main Scientific Branch is to provide education to music teachers for primary and secondary schools in her country. She is giving "Teaching Methods in School Music Education" to the music students. She also has interested in "teaching methods in music education", "school experience", "teaching and learning in Higher Education, including student expectations and achievement predictors.

Thomas Connolly is a Professor in the School of Computing at the University of the West of Scotland, having managed the Department of Computing and Information Systems for several years. Thomas worked for over 15 years in industry as a Manager and Technical Director in international software houses before entering academia. His specialisms are games-based learning, online learning and database systems. He has developed three fully online MSc programmes and developed and leads the undergraduate BSc Computer Games Technology programme. He is co-author of the highly successful academic textbooks Database Systems (now in its 4th edition) and Database Solutions (in its 2nd edition). He is a reviewer for

several international journals and has been on the committee for various international conferences. He is a member of CPHC (Council of Professors and Heads of Computing) and member of the Higher Education Academy

Mary Coughlin, MS, NNP, CCRN is a neonatal nurse practitioner and the Manager of Global Clinical Services for Children's Medical Ventures. Mary's tenure in the specialty of neonatal nursing includes seven years of active military duty in the U.S. Air Force Nurse Corp and fifteen years as an NNP at the Brigham and Woman's Hospital in Boston, MA. In her current position, Mary's responsibilities focus specifically on evidence-based practice and education program content and learning platform development and as well as quality healthcare initiatives and analysis of the impact of education on clinical practice changes.

Luis de Marcos has a BSc (2001) Computer Science and a MSc (2005) in Software Engineering from the University of Alcalá, where he is a pre-doctoral researcher and a PhD candidate in the Information, Documentation and Knowledge program. He is member of the IEEE Learning Technology Standard Committee (LTSC) and of the ACM Special Interest Group in Computer Science Education (SIGCSE). His research interests include competencies and learning objectives definition, adaptable and adaptative systems, learning objects, mobile and ambient learning, and e-learning standardization.

Elise Gendron is a second year PhD student, at the University of Savoie. She obtained her Master in the computer laboratory at the University of Maine (LIUM).Her interests are concerned with the collaborative activities improvement. In particular, she wants to point out which collaborative indicators are useful to improve a collaborative process. Her results are both applied to the educational activities (CSCL) and to the work activities (CSCW). More recently, she decided to look carefully at the educational game domain, where indicators are significant from the awareness point of view.

José Luis González Sánchez: Lecturer in the Software Engineering Department and Research Member of GEDES Software Research Group, University of Granada, Spain. He is specialized in videogames design and playability techniques. He is interested in the use of videogames as classroom support tools. He has collaborated with Nintendo Spain in different studies about the real impact of videogames in the mental training. He is member of the Human-Computer Spanish Association.

Francisco Gutierrez Vela: PhD in Software Engineering, Lecturer in the Software Engineering Department and Research Member of GEDES Software Research Group, University of Granada, Spain. He is specialized in interactive systems, user interface design and collaborative design systems. He is interested in the use of videogames and interactive systems applied to education. He is member of the Human-Computer Spanish Association.

Thomas Hainey is in his final year of his doctoral studies at the University of the West of Scotland. His research is focused on the application of games-based learning to teach requirements collection and analysis in software engineering.

Hanno Hildmann is a PhD student at the UNiversity of the West of Scotland (UWS) working on the formal design of serious games for mobile devices. He has an MSc in Artificial Intelligence from the University of Amsterdam and has been involved in teaching or research at universities in Germany, The Netherlands, Italy, England and Scotland.

Jantina Huizenga is a PhD-student at the Graduate School of Teaching and Learning at the University of Amsterdam. Her research subject is Game-Based Learning in secondary education. Jantina's academic background is Education and Child Studies. Her research interest is in ICT in Educational Sciences."

Jennifer Jenson (Associate Professor, York University) and Suzanne de Castell (Interim Dean, Faculty of Education, Simon Fraser University) work together on a number of projects, including the design and development of games for education. They are co-editors of a online, open access journal, *Loading...: A Journal of the Canadian Game Studies Association* (http://journals.sfu.ca/loading/) as well as a collection of papers on digital games research, *Worlds in Play* (Peter Lang, 2007).

Elisabeth Katzlinger-Felhofer Scientist at the department of Data Processing in Social Sciences, Economics and Business, Johannes Kepler University Linz, Austria. She has degrees in business administration and pedagogy. Her research interests include business education and technology enhanced learning.

Kristian Kiili is the senior researcher in Tampere University of Technology, Information Technology at Pori, Finland. He got his M. Ed. from the University of Turku in 2001 and his Dr. Philosophy at Tampere University

of Technology in 2006. Recently, Kiili has studied issues related to learning, user experience and game design. He has participated in several research and development projects on this area.

Helmut Krcmar holds the Chair for Information Systems at the Department of Informatics, Technische Universität München (TUM), Germany since 2002. His research interests include Information and Knowledge Management, IT-enabled Value webs, Service Management, Computer Supported Cooperative Work and Information Systems in Health Care and eGovernment.

Terry Lavender is a Vancouver-based game researcher and consultant, specializing in social advocacy games. A graduate student at the School of Interactive Arts and Technology at Simon Fraser University, he is best known as the creator of Homeless: It's No Game, which he has been using to study the persuasiveness of video games. Lavender is also the communications manager at Simon Fraser University's Surrey campus and is a volunteer with various community and housing groups in Vancouver.

Jörgen Lindh is Associate Professor of Informatics at Jönköping International Business School (JIBS) in Sweden. Jörgen has during almost three decades been involved in development work and Swedish research projects in the field of computer supported learning. During the last five years he has paid a lot attention to online learning. At the moment Jörgen is a coordinator of the research group "Networked Learning, Collaboration and Competence" at JIBS.

Maria da Conceição de Oliveira Lopes – PhD in Communication Sciences and Technology from the University of Aveiro. She is Auxiliary Professor with Distinction at the University of Aveiro and teacher on the degree courses, and on the master's courses in Communication and Education in Science and Multimedia Communication. She is a member of the Centre for the Study of Technology, Art and Communication) research unit and has participated in many research and training projects, and community and institutional intervention programmes over the past 30 years.

Bente Meyer is an Associate Professor at the Department of Curriculum Studies, School of Education, University of Aarhus and a member of the research programme Media, ICT and learning. Her research interests are second and foreign language education, intercultural and citizenship education as well as computer assisted language learning (CALL). She has edited several books on media, ICT and Learning, the most recent one being Digital Media and Educational Design (Digitale Medier og Didaktisk Design, The Danish University of Education Press, to be published in the Fall of 2008).

Miroslav Minovic is Ph.D. student at Belgrade University, Faculty of organizational science, Informational Systems department. He is also engaged as teaching assistant and member of Multimedia Communications Lab since 2003. His major field of research is game-based learning, HCI, mobile computing and computer networks.

Magali Moisy a psychologist used ICTs such as video games to help adults and teenagers. Now, she is researcher in the field of Education at the University of Rennes 2 (France). Today, she is doing an international comparative study (Québec, France, Suède, Mexique) about undergraduate students' Internet appropriation and a thesis on students and video gamers.

Benoit Montreuil is professor of operations and decisions systems in the administration sciences faculty of Université Laval in Quebec City, Canada, since 1988. He got his Ph.D. (1982) in Industrial Engineering from the Georgia Institute of Technology (Atlanta, U.S.A.). He holds the Canada Research Chair in Enterprise Engineering and the NSERC-Bell-Cisco Business Design Research Chair. He is a founding member of the CIRRELT Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation. His main research interests lie in developing concepts, methodologies and technologies for creating, transforming and enabling businesses and value creation networks to thrive in the new economy. He has extensive advisory, entrepreneurial and collaborative research experience with industry.

Javed Mustafa   MSc Mathematics, MA Political Science and MEd Teacher Education.Taught mathematics at secondary level in public schools for eleven years. Remained as part time tutor and resource person at Allama Iqbal Open University Islamabad in BEd and MEd programs for six years.Recieved four months lead master training at National Institute of Science and Technical Education, (NISTE) Islamabad, Pakistan for teaching mathematics and forty days training of laboratory organization at Melburn University, Australia. Worked as master trainer in the second science education project and trained more than two hundred mathematics teachers. Currently working on PhD thesis at International Islamic University Islamabad, Pakistan.

Sol Nte spent 10 years developing software for research and teaching in the School of Psychology at Keele University (UK). During this time he was able to experiment with videogame mechanisms and also lecture in multimedia software development. He is currently undertaking a PhD in Computer Science at Wolverhampton University (UK) looking at reconstructing videogame user-experiences for E-Learning.

Gearóid Ó Súilleabháin is the elearning projects manager for the DEIS Department of Education Development in the Cork Institute of Technology where he also works as a lecturer in modules relating to the fields of education, educational psychology and elearning. He had been working in the elearning field for over 10 years and has over this time published and presented widely on a range of topics. He is currently undertaking a Phd on the topic of "Learning Transfer and Computer Game Environments".

Karen Orr is a 3rd year Psychology PhD student at Queen's University, Belfast, working under the supervision of Professor Carol Mc Guinness. Since beginning her PhD Karen has worked with schools from both Northern Ireland and England. Work to date has examined teachers' and pupils' attitudes towards games-based learning, as well as observational research focussing on pupils' use of games-based learning applications, assessing their interactions, collaboration and dialogue.

Michela Ott works as a senior researcher at the Institute for Educational Technology of the Italian National Research Council (ITD-CNR). At present, she carries out researches in the field of: cognitive processes underpinning learning, educational use of software tools (including digital games), e-learning effectiveness, learning design, distance education, special education (including, disabled children and also both long term hospitalised and immigrant children

Patricia Paderewski Rodríguez: PhD in Software Engineering, Lecturer in the Software Engineering Department and Research Member of GEDES Software Research Group, University of Granada, Spain. She is specialized in software architectures, software evolution and adaptation and software distributed agents for collaborative work environments and classroom work.

Natalia Padilla Zea: Research Member of GEDES Software Research Group, University of Granada, Spain. She is a grant holder by the Spanish Ministry of Education and Science, F.P.U Programme. She is specialized in collaborative videogames techniques to apply them to education and cognitive work and psycho-pedagogical classroom work methodologies.

Eleni Rossiou BSc in Mathematics, MSc in Computer Science, Postgraduate Certificate in Distance Education, PhD candidate in the area blended learning methods with synchronous (virtual classrooms, educational games) and asynchronous tools (LMS, webcasts). She is a teacher of Informatics in secondary education, member of Algorithmic Operations Research Group of the University of Macedonia, member of Hellenic Network of Open and Distance Education, and member of Hellenic Scientific Association of Information and communication technologies. She is authored and co-authored in various research papers and books. She has extended experience in distance education, adults' education, teaching and learning in virtual learning environments and development of eLearning materials

Elizabeth Salles (B.Ed., Grad.Dip. Comp. Ed.) is the Head of the Information Technology Department at Iona College in Australia. She has presented at numerous National and International Conferences with published research on the use of IT in the classroom. She has also been involved in providing training for some leading Australian Universities.

Andy Smith helped design and develop one the world's first massively multiplayer persistent worlds and went on to run a successful games design and development company for over 17 years, creating various IP's in the process. Turning his attention to education, Andy became a college lecturer as well as a PhD scholar, focusing on the role of narrative and emotion on learning in serious games.

Elsebeth Korsgaard Sorensen is a senior lecturer in ICT and Learning in the Institute of Information and Media Studies, University of Aarhus, Denmark. For many years she was head of the online Master programme in ICT & Learning, offered collaboratively by five Danish universities. Her international research focuses on collaborative dialogue and knowledge building online, pedagogical design and delivery of networked learning, and implementation of electronic portfolios as reflective tools in online learning process. Elsebeth presents her research at international conferences, frequently as keynote speaker, and she has published extensively in international journals and books within the field. She serves on the editorial board of several international journals and on program committees of international conferences within the field.

Mark Stansfield is a Senior Lecturer in the School of Computing at the University of the West of Scotland. He has a PhD in Information Systems and has written and co-written more than 70 refereed papers in areas

relating to e-Learning, games-based e-Learning, information systems and e-Business. Journals in which papers have been published include the European Journal of Information Systems, Systems Practice and Action Research, the Journal of Further and Higher Education, the Journal of Electronic Commerce Research, the Journal of IT Education, and Computers and Education. Mark also serves on the editorial boards of several international journals that include the International Journal of Information Management, Journal of Information Systems Education, ALT-J and the Journal of IT Education. Mark was appointed Member of the International Association of Science and Technology for Development (IASTED) Technical Committee on Education for the term 2005-2008 and is a Registered Practitioner of the Higher Education Academy in the UK. He has presented papers at international conferences for over 15 years and has won Best Paper Awards at a number of conferences that include the UK Systems Society Conference in 1993 and the Informing Science and IT Education Conferences in 2003 and 2006.

Lam Tak Ming has had over 15 years of business operations and venture experience before joining this University. He had held senior positions as Managing Director and CEO with various local and international prestige organizations, in such diversified industries as Web Based Learning, e-Business Strategies, Business Process Reengineering, Web Promotion, Advertising, Marketing, Mobile Communications, Telecommunications, Data Communications, IT Education and Management Consultancy, etc.

Maria Toro Troconis Maria is a senior learning technologist at the Faculty of Medicine, Imperial College London. Her main role is to support the development and delivery of the Faculty's e-learning strategy. Her research interest is game-based learning for the delivery of virtual patients in Multi-User Virtual Environments (MUVEs), such as Second Life. She is currently undertaking a PhD within the Faculty of Medicine in Imperial College London and Luleå University of Technology entitled "Gender-related differences and game-based learning for virtual patients in Second Life". Her key skills include instructional design, coordination across distributed teams, business analysis and project management. She also has an in depth knowledge of International Learning Standards and their implementation across platforms.

Anisa Vahed is a Dental Technologist and lecturer in the Dental Technology programme, Dental Sciences Department at the Durban, University of Technology, South Africa. In 2005, she obtained her Master's degree in Dental Technology and identified a potential niche area in Dental Technology education involving game based learning. She has been working for the past 2 years on the development of the Tooth Morphology board game (2006) and "Muscle Mania" multi media game (2007) as a learning tool for first year Dental Technology learners."

Michael Vogel is both a professor and a student. At the University of London's Institute of Education he researches for a Doctorate in Education. His interest in higher education is related to his job back home in Germany where he is a Professor of Tourism Management at the Bremerhaven University of Applied Sciences. His research interests include tourism economics, economic education and the professionalism of higher education teachers. In his pre-academic life Michael worked in corporate strategy consulting and for an international tourism group in various countries.

Dick van Dijk is concept developer at Waag Society. Waag Society is an Amsterdam based Medialab investigating the interplay of culture and technology in relation to society, education, government and industry. Waag Society wishes to make a contribution to the design of the information society by looking at the possibilities of people, their creativity and culture.

Monica Wijers is a senior staff member of the Freudenthal Institute (FI) of Utrecht University in the Netherlands. She is currently involved in several design and research projects on mathematics problem solving, learning and teaching and the use of technology. She participates in the Th!nklets development team (www.thinklets.nl) and in research into the role of games in relation to mathematics, in educational setting as well as in informal settings. She is co-designer of MobileMath.

Pieter Wouters is researcher at the Institute for Information and Computing Sciences (ICS), Utrecht University. He holds a Ph.D (2007) in Instructional Design (How to optimize cognitive load for learning from animated models) from the Open University of the Netherlands. His current research focuses on cognitive and motivational processes in learning from serious games and game discourse analysis.

Study to Inform the Design of a Psycho-Educational Game: Children and the Magical Do Better

Hend Alshanqiti, John Carr and Peter Blanchfield
University of Nottingham, UK

Abstract: Factors currently affecting the use of Cognitive Behaviour Therapy (CBT) include limitations on access due to the lack of therapists, the cost involved and the reluctance of patients. The National Institute for Health and Clinical Excellence (NICE) recommends Computerized CBT (CCBT) as a way of tackling these problems. A number of attempts have been made to use computer games as a specific therapeutic tool. Most of these have been directed at older age ranges and those with good reading skills. Our work is in the development of a computer game to be used specifically in the treatment of young children (8-12 years) who are exhibiting behavioural disorders. The children in the target group are experiencing a range of emotional problems with various causes. The children have specific needs and behaviours which affect the way in which they will interact with games. The design of this game has involved us in a long term ethnographic study of the children during their treatment and experiments involving two groups of children playing a number of computer games. These studies have enabled us to determine the nature of the game and to establish how the children interact with computers, the types of games they would relate to and the levels of complexity they could cope with. Most of the children come from deprived backgrounds with low academic achievement but have a relatively high exposure to computer games and "sophisticated" tastes. The results of the study and further research including interviews with therapists have informed the design of the game. One crucial factor has been the inclusion of psycho-education principles in the design. In common with most other CBT games it is a role-play game with a set of tasks. However, from our study we can see that the interfaces provided by most current CBT games would have a limited appeal – being too simplistic in some ways but requiring too large a vocabulary for the target group of children. Providing a sophisticated interface but where a limited level of reading is needed has proved an important factor in the design. In addition the player is given the ability to design his or her own character to improve identification. A "conscience" character – the magical do better – who has qualities determined by the player's chosen character accompanies the player.

Keywords: Ethnography, CBT, young children with behavioural problems, psycho-education

Groovy Music: Research Based Product Design Applied to Games Based Learning in Primary Music Education

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Abstract: How can game interactions be beneficial to children's music learning? How can software based game models be applied to music, and how can this influence software design? What are the practical issues for children involved in learning with music software games including their use in a networked environment and the relationship between attention span and average class time?

Groovy Music is a research-based product by Sibelius Software that applies games-based learning to children's music exploration and creativity. Designed using research with over 500 children, it is now used in thousands of schools worldwide.

Effects of Two Types of Sudoku Puzzles on Students' Logical Thinking

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Abstract: This study aims to investigate the effects of Sudoku on students' logical thinking. Specifically, the author wants to measure the effects of playing a number-based Sudoku and a symbol-based version on player's logical thinking, especially in terms of their cognitive developmental stages. The subjects for this study were 121 third and sixth graders in H Elementary School in Korea. Two classes were randomly selected from nine third grade classes and the other two classes from eight sixth grade classes. One of two classes in each grade received the number-based puzzle and the other class the symbol-based version. Thus a total of two classes, one for third grade and another one for sixth grade, received the number-based version. The other two classes received the symbol-based puzzle. The collected data were analyzed using the SPSS t-test procedure. The data analysis shows that the symbol-based puzzle has a significant effect on the logical thinking of students in the dimensional stage of cognitive development. The number-based puzzle has a significant effect on the logical thinking of students in the vectorial stage of cognitive development. This result leads us to the conclusion that a graphics puzzle and a number puzzle game may have better effects for the learning of students in the dimensional stage and the vectorial stage, respectively. This may have implications for developing and using games for students of those ages.

Keywords: Logical thinking, Sudoku, puzzle, cognitive development stage

Funchal 500 years: Learning Through Role Play Games

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Abstract: It is commonly accepted that the educational environment has been undergoing considerable change due to the use of the Information and Communication tools. But learning depends upon actions such as experimenting, comprehending, visualizing, abstracting and demonstrating, by means of which the learner succeeds in constructing his own knowledge. It is not always easy to achieve these actions through current distance learning approaches. Since we live in a society that demands creativity, globalization, responsibility, autonomy and the ability to deal with virtuality and new technologies, Role Playing Games (RPG) may well develop such capacities. The creation of an interactive computer game with RPG characteristics, about the 500th anniversary of the city of Funchal, the capital of Madeira Island, is invested with compelling educational/pedagogical implications, aiming clearly at teaching history and social relations through playing. By incorporating the concept "games to teach", players will interpret different characters in different settings/scenarios, experiencing adventures, meeting challenges and reaching multiple and simultaneous goals in the areas of education, entertainment and social integration along the first 150 years of the history of Funchal. Through this process they will live and understand all the social and historical factors of that age.

Keywords*:* Historical environment, interactive game, learning, role play game

Open Source Portals for Online Simulation Games? The computer-supported Business Game "Go4C" for realistic IT and Business Management training

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Abstract: The education and training of IT in interrelation to business management at universities is seen more and more critical in the last years because of often delivered 'inactive' knowledge and the lack of reference to reality. By contrast surveys of companies and management executives disclose a strong need for IT managers with a wide range of knowledge and skills: Holistic competencies for analysis of business values, (strategic) decision making in strong time restrictions, thinking in processes, and in particular the ability for communication, discussion and presention. One effective way for the instruction of sustainable and future-oriented decision making is the work with computer-supported business games. Realistic web-based business games for IT and management training, however, can reach a high complexity and in most of the cases demand various elements like user administration, authorization, community tools and a dynamic business model of the simulated company. Hence, a 'from scratch' development of an online platform for business games is a very laborious and time-consuming process. Existent open source portals can provide a powerful basis for the online business game development. Portals deliver a solution for the aggregation of content and individual applications and moreover offer a single point of contact, customized views and even collaboration features via an easy-to-use web interface.

Because of the disclosed source code of open source portal projects, the portal features can be enhanced with the requirements of a business game like the business model or the specific views on business ratio systems or game management tools. These applications are plugged into the portal as so called portlets or portlet applications. On the basis of academic research the chair for information systems of Prof. Helmut Krcmar at the TU München in cooperation with the management consultancy Accenture designed, implemented and evaluated a web-based, computer-supported business game for IT management training for students and entrants in IT management. The current online version of the business game is totally integrated into an open source portal structure.

"Go4C" regards a holistic approach for the strategic and operational IT- and business planning, controlling and monitoring. The fundamental training aims are derived from current studies and interviews with executives of the first and second leadership level in different industries in connection with learning theory, didactical principles and multimedia integration. In our paper we give insights into the conceptual and technical framework of the business game "Go4C" on the basis of the "Liferay" open source portal. Moreover the paper delivers an overview of the different game concepts and the didactical framework behind the business game. Finally we present first evaluation results of the practical trainings with students and executives in IT strategy.

Keywords: Computer-supported business game, open source portals

Play it Seriously: Juxtaposing AR and RW Crises

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Abstract: Recently, "serious games," especially those promoting sociopolitical change, have garnered increased attention. A number of projects and special interest groups that facilitate the development and study of these games have emerged (e.g., Social Impact Games, the Serious Games Initiative, the Alternate Gaming Network, and the Games for Change Conference). Of the recent serious games projects, *World Without Oil (*WWO*)*, "the alternate reality game with a heart of gold" (ARGNet, 2008), has received much attention, attaining, among other accolades, a SXSW (South by Southwest) Web Award for activism. The game has been promoted by Ken Eklund (Creative Director) and Jane McGonigal (Participation Architect) as a storied place in which players might imagine the impact of a future oil crisis with a view to making real-world change. In describing the game, promoters and players move back and forth between the inherent rhetorical extremes of serious gaming: the game is about crisis, but it is also "fun."

This paper will examine the tension between these modes of experience by juxtaposing players' narratives and imaginings around the WWO simulation (as evidenced in the extant online WWO digital artifacts) with the reality of the oil crisis as experienced by the first author in war-torn Serbia in the early 1990s, when power and oil shortages were a reality that challenged people's ability to attain the basic necessities of living for themselves and their children on a daily basis. Since games are generally designed, developed, and played by those who have money and access, the question is whether they truly have the potential to move beyond a purely literary exercise. As Fulford (1999) observes, "Narrative gives us a way to feel empathy for others. But it can work in the other direction, too. Narrative can make us smug by persuading us that we understand more than we actually do" (p.152). While we regard games such as WWO as important spaces to examine social issues, we also wish to explore the paradox that is inherent in such games in order to attain a better understanding of their affordances for education.

Keywords: Serious games, social change, narratives, storytelling, collective intelligence, real-world crisis

The Impact of Mind Game Playing on Children's Reasoning Abilities: Reflections from an Experience

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Abstract: The paper aims at contributing to the understanding of whether digital games can be considered suitable and effective tools for enhancing learning. It thus aims at providing grounds for reflecting if their school use can provide a significant added value with respect to traditional school activities.

The paper draws on a long-term research experience carried out in primary schools with the specific aim of studying the impact of the use of mind games (puzzles, brain teasers…) on children's reasoning abilities and problem solving skills. Early activities in this field at primary school level, appear to be particularly important since reasoning and problem solving abilities are universally acknowledged to be "key skills", transversal to any kind of learning and there are grounds for believing that improving such abilities will impact on the global school achievement.

The hypothesis that a teacher driven and well focused use of carefully selected mind games can have a positive impact on students' reasoning abilities is put forward.

A number of reflections and observations are outlined, based on both the analysis of the quantitative results of students' performance and on the teachers' opinion on the impact of the experimental activities on pupils' school achievement.

From a quantitative point of view, the results of a standardized test carried out at national level, revealed, in fact, that students who had undergone three years of experimental activities with games, performed better at the mathematics test (which also included logic items) with respect to those of two matched classes. Such results also showed that high achiever students seemed to have benefited from the work with games more than low achievers.

Beside the encouraging test results, from a more qualitative standpoint, personal opinions and individual findings of the school teachers involved in the project seem to confirm that, following the extensive use of logical games, positive effects were observed both on the students' attitude towards learning and on their global school performance.

Keywords: Games based learning, mind games, reasoning abilities, primary school

A Review of Theories of Player Enjoyment in Playing Computer Games

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Abstract: This paper provides an overview of theories which have been proposed to explain the enjoyment felt by players in playing computer games. It has been argued that, while players clearly enjoy playing games, our understanding of player enjoyment is under-explored. A number of theoretical perspectives are discussed which may be relevant, including Deci and Ryan's self-determination theory, Malone and Lepper's account of components of intrinsic motivation, uses and gratifications theory, arousal theory, Csikszentmihalyi's flow theory and Apter's reversal theory.

The former theories help us to understand player enjoyment in terms of the satisfaction of needs. For Deci and Ryan enjoyment arises in satisfying very general intrinsic needs for competence, autonomy and relatedness, while uses and gratifications theory examines how computer games satisfy more specific needs for entertainment.

Arousal theory, Csikszentmihalyi's flow theory and Apter's reversal theory provide explanations of the immediate subjective experience of enjoyment felt in playing games. The traditional notion of arousal is a key construct in this respect, but recently concerns have been expressed that arousal is more complex than previously thought and we need to clarify our understanding of different kinds of arousal felt in playing computer games. Flow theory introduces the notion of skills, emphasising the delicate balance between the skills of the player and the demands of a task which lead to the extreme enjoyment experienced in conditions of flow. Apter's theory provides a compelling explanation of the sudden emotional flips which occur while carrying out an activity, from extreme anxiety at one moment to extreme joy as we manage to achieve a goal.

To conclude, these theories all contribute to our understanding of enjoyment but there is still some way to go in developing a fuller and more integrated model of enjoyment in computer games. Future research should work towards this aim and should also examine the compatibility of enjoyment with learning.

Keywords: Enjoyment, motivation, self-determination theory, arousal, flow theory, reversal theory

Games for Learning: Does Gender Make a Difference?

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Abstract: An important factor to consider in developing educational computer games concerns whether there are any differences between learners in their acceptance of games for learning. In particular there is concern that the strong male preference found in playing games for leisure might also extend to games-based learning, making males more accepting of games in learning than females.

There is clear evidence that the violent content and competitive structure of many games, gender stereotyping of female characters, the lack of opportunities for meaningful social interaction between game characters and the visual skills required to succeed in many games are features of games that make them less appealing to females than to males. Games manufacturers have responded to criticisms that games are male-oriented by developing games which aim to appeal to both males and females. However they have also acknowledged that boys and girls essentially prefer different types of game and they have also developed games specifically targeted at girls. These preferences in computer games have helped to confirm that males and females have different interests and preferences which are very deep rooted and emerge in infancy. Woudheusen has argued that these preferences are resistant to change as they probably reflect biologically influenced inclinations which are crystallised by socialisation processes.

While it is acceptable to develop different games for leisure for boys and girls, with games for learning the situation is more complex. Schools and universities need to be inclusive and new learning methods and materials should aim to be gender neutral. However games for learning are being introduced into a prevailing motivational climate in schools which suits the more committed and methodical approach of girls. Many boys subscribe to the "Not cool to study" view and this has led to a culture of underachievement and "laddishness" amongst boys. It is tempting to argue that the easy engagement and the active, competitive style of interaction required in many computer games provides an ideal opportunity to re-engage many disengaged young men in learning.

Ultimately it seems likely that the way forward is to develop a range of games for learning which are competitive or not and which include social interaction or not and to guide students in selecting games which are most congruent with their own individual preferences. As with any other educational intervention, games for learning will need to be evaluated to ensure that they help learning and that they do so in a way that as far as possible does not favour one group over another.

Keywords: Computer games; gender differences; violence; competition; challenge

Games-Based Learning in Teacher Education: A Strategy to Integrate Digital Games into Secondary Schools

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Abstract: The importance of information and communication technology (ICT) in our daily lives is growing. To prepare future employees to this evolving environment, technology should play a role in education. Furthermore, computer technology serves as a valuable and supportive tool to improve teaching and learning and allows new types of teaching and learning experiences to evolve. For instance, the concept of digital games-based learning (DGBL) has been growing for many years now. In order to prepare the next generation of teachers according to the image of society, teachers must be adequately trained.

In this article, the authors describe the design, implementation and evaluation of two courses on digital games-based learning (DGBL) developed for the pre-service teacher training programme in health education in Flanders (the Dutch speaking part of Belgium). Both courses were set up as an introduction to digital games and gaming for learning and instruction. The objective was to provide an opportunity for students to explore (i) the possibilities, considerations and constraints related to the design of digital instructional games, and (ii) the practical design and try-out of a game in classroom settings using standard or free software (such as Excel, Hot Potatoes, JClic). Results show that the games' inclusion in the formal curriculum encouraged them in using GBL in their future teaching activities and enables them to engage their supervising teachers into using games in their classrooms.

Keywords: Teacher training, games-based learning, active engagement, game design

An Experimental Study of Game-Based Music Education of Primary School Children

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Abstract: In order to determine which method would be more successful in teaching "Rythm in Music" to the sixth grade 12 year old students, a state primary school (in Turkey) was chosen. An experimental study "pre-test and post test method with a control group" was held and was carried out with a total of 52 students 26 of whom were in the "study group" and 26 in the "control group". In this study, it was aimed to observe how children respond in learning the two, four and eighth note values and rhythm patterns and whether they were able to identify the notes, reproduce them in beats and write down what they listen to (notation). Teaching to both groups "The Element of Rhythm" by means of games called "Bingo", "Wheel" and the follow up activity of "Write down What You Listen to" was the main aim of this study. Researchers collected data by means of:

a) a "personal information form" containing information about each student's background;

b) an information test prepared by the researchers to evaluate the knowledge of the student about "The Element of Rhythm in Music" and given before and after the experimental study;

c) an observation form for each student which was filled in throughout the games played and activities done in the classroom.

The duration of the study was for four weeks. The students took a pre-test at the beginning of the four-week period and a posttest at the end.

According to the findings after the pre and posttests, the skills and capabilities of the 6th grade primary school children in recognizing, playing and writing down the note durations of quarter, half and eighth notes as well as the rhythm patterns consisting of various partitions differentiated substantially according to the teaching method used in the classroom. Furthermore, with respect to the relation to the variable of gender and the variable the financial status of the family and the variable of the parents' educational background and the variable of the parents' occupation point out to slight differences in the achievement rate of the students. Consequent to the research, it is found out that the children in the study group were far more successful than the children in the control group at every stage.

Keywords: Music education, musical games, rhythm education, classroom music education

Arguing For Multilingual Motivation in Web 2.0: Using Alternate Reality Games to Support Language Learning

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Abstract: Computer games have become an enormous industry over the past two decades and have dramatically changed the leisure activities of adolescents and many adults as well as children. More recently there is a growing appreciation of the potential of computer games as a medium for learning. Such games were initially referred to as edutainment, although this is now a deprecated term and are nowadays referred to as games for learning or serious games. Indeed many people now believe that the games for learning industry is set to make a significant impact over the next decade with a wide variety of educational computer games being developed to support learning. Researchers have examined computer games from many different perspectives, some positive (for example, motivation, engagement, learning, skills development) and some negative (for example, violence, aggression, gender stereotyping). One particular type of game that has not been explored in detail for educational purposes is the Alternate Reality Game (ARG), a form of interactive narrative, often involving multiple media and game elements, to tell a story that may be affected by participants' ideas or actions. In this paper we describe the use of an ARG to help support the teaching and learning of modern foreign languages by European secondary school children (ages 14-16).

Keywords: ARGs, motivation, collaboration, social networks, modern foreign languages

Development of a General Framework for Evaluating Games-Based Learning

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Abstract: The field of games-based learning (GBL) has a dearth of empirical evidence supporting the validity of the approach (Connolly *et al*, 2007a; Connolly *et al,* 2007b; de Freitas, 2007). One primary reason for this is a distinct lack of general frameworks providing guidelines for structured GBL evaluation. The literature has a wealth of articles suggesting ways that GBL can be evaluated in terms of particular areas with particular measurements, experimental designs and analytical techniques. This paper will present the results of an extensive literature search to identify measurements that have been taken in relevant studies. A new evaluation framework will be presented based on the compilation of all the particular areas and analytical measurements found in the literature. The paper will also briefly review existing frameworks applicable to GBL and will provide general guidelines to focus researchers on particular categories of evaluation, individual measurements, experimental designs and texts in the literature that have some form of empirical evidence or framework relevant to researchers evaluating GBL environments. Due to the extensive nature of the framework, this paper will specifically focus on the GBL environment category composed of evaluation of environment aspects, pedagogical aspects focused on scaffolding, usability, social presence and embedding games within the curriculum.

Keywords: Games-based learning, evaluation, framework, pedagogy, scaffolding, usability, deployment, social presence

Game Based Learning as a Vehicle for Practice Change and Quality Caring in the Neonatal Intensive Care Unit

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Abstract: The delivery of high quality evidence-based healthcare requires ongoing professional education across all disciplines. Clinical educators as well as individual clinicians are challenged with time constraints, a dynamic growing body of knowledge and the limitations of existing learning platforms in ensuring the transformation of learning into quality care delivery. The 2001 Cochrane Review concluded that interactive educational workshops for healthcare professionals results in moderately large practice change when contrasted to didactic sessions and reading materials. Two more recent Cochrane reviews (2006 & 2007) indicate that audit and feedback as well as educational follow-up visits were effective in improving professional practice and professional performance. With eLearning trends extending into healthcare, the design advantage of a game-based learning platform encourages wider and repeated use to amplify learning and critical thinking opportunities among users to apply acquired knowledge into clinical practice. This enhanced learning platform will engage the learner and facilitate improved professional practice and performance through application of evidence-based practices that favourably impact clinical, social and economic outcomes.

The next generation of healthcare professionals has been cultivated in an ever evolving technological environment and require on-demand access to information. Baby-boomer health professionals are gradually gaining literacy with technology as trends in IT integration within the healthcare environment expand. Game-based collaborative learning for continuing professional education, practice improvement, and adoption and implementation of standards is a practical solution to operationalize adult learning principles with technology. Learning through simulations has played a significant role in many industries; however the application of e-simulation in healthcare is still relatively in its embryologic stages. This paper attempts to outline the opportunity for a game-based learning environment to influence as well as directly impact developmentally supportive care practice adoption and implementation in the neonatal intensive care setting. Measurement criteria will be the application of the principles of the Universe of Developmental Care Model (Figure 1)(Gibbins et al 2008) and the Core Measures for Developmental Care (Figure 2) (Coughlin et al *In Press*).

Geography Educational Gaming System for Mobile Devices

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Abstract: Our proposal is a geography educational gaming application aimed to mobile devices. More in depth, it is a game that instructs users in the learning of geography. It helps to exercise the users' memory, produces an enhancement in the user geography knowledge and lead to these benefits trough exercises that are interesting and challenging, in the boundaries between gaming and studding. The game we present can be considered as a brain training game but we shall avoid the use of this name in particular because of its commercial implications. These kind of games are meant for casual gaming, when the users have time to spare, like when travelling on train or bus, on breaks during work, and such.

On top of that, certain studies have proved that regular play of brain challenging games can contribute to brain health. Just like a muscle can keep fit when it's used regularly, brain can be also kept health by performing simple exercises, just like our game does, also including the additional benefit of knowledge increase and versatility and interesting contents.

The type of game is not complicated to play at all. A map is given to the user, as well as the name of a country, or the name of a country capital, and it will invite the user to click on the map in the place where they think the actual country is.

This game is easily upgradeable; a option is given to the user to download new maps, and new types of questions. For instance, instead of supplying the name of a capital to the user, it can show the name of an historic event, or the name of a famous person, then the user should click on the place where the event took place, or the person was birth.

In order to do this, a distribution platform was also created. This platform allows user to download learning contents like games, manuals, updates for such games, etc. This platform adapts itself to the device characteristics, so users can only download suitable content for their phones, pdas, etc, which are part of what is known as ubiquitous communication (Nyiri, 2002).

Our work is part of the TIFYC research group works at the Computer Science Department of the Alcala University. We focus on e-learning and ubiquitous computing. Also, one of the main research areas, m-learning (also known as mobile learning), surge from the joint of these two research fields and comprises the work we are presenting.

Keywords: Educational-game, mobile-learning, brain-challenging, network, updating

Technological Platform for Info-Educational Contents Sharing

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Abstract: The platform presented aims to the creation of an open interchange point where shared of educational content, not only games can be done. The main subject of the games supported by the platform team focuses on gaming-learning (g-learning). To deal with this objective, the platform is built using the latest Java technologies, represented by the Struts framework, which is designed to create web applications with excellent maintainability and extensibility. As the system is intended to be accessed from mobile devices and desktop computer web browsers, it supports web protocols and languages as well as wap ones. The wap version of the share point is optimized for small-screen devices, like the ones pdas and cell phones have.

On top of that, the application can gather information from the devices used. It can check the capabilities of that device, such as resolution, installed operating system, and additional components, like the java virtual machine installed (if any). Those capabilities can be checked against a requirement list used by the educational applications, and by doing so, the platform can hide those educational applications that are not suited for the specific device.

The platform can be used as well to distribute updates for the downloaded educational applications. Updates can be checked by having a look at the news section. This news section can also display other important information such as events, competitions, and so on. On the other hand, users can not only download educational applications, but also manuals and other relevant learning information.

These characteristics, lead to a traditional download site, but the system presented includes also the possibility to upload new games or personal versions from existing ones to any user, but a registration is required to ensure the control of undesirable behaviours.

In order to complete the site, some rating and statistical options are added. Most of them are automatic and they are aimed to increase the site interactivity and its adaptation to the evolution of the users' preferences. Some of this possibilities are used to automatically record the best rated and most downloads and offer them to the user as the first or recommended option.

Keywords: Gaming-learning, content-distribution, educational-content

Collaborative Indicators in Learning Games: An Immersive Factor

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Abstract: The work reported here takes place in the educational domain. We propose an approach of a learning environment based on a graphical representation of a course: a pedagogical dungeon equipped with the capacity for collaboration in certain activities. The emergence of online multiplayer games led us to apply the metaphor of exploring a virtual world, a dungeon, where each student embarks on a quest in order to collect knowledge related to a learning activity. In the dungeon, each room represents a place, sometimes a collaborative place, where students are supposed to acquire a particular concept.

The experiments pointed out that although the students appreciate this approach, there is an obvious need for awareness, especially for the teacher. Indeed, the teacher needs to adapt his/her pedagogical session according to what is going on during the collaborative activity. We thus need to provide the teacher with collaborative indicators, and this information must be part of the game in order to keep the immersion of the teacher inside the game.

In this paper, we focus especially on the need for collaborative indicators concerning both the knowledge (success and failure for sub activities) and the behaviour (talkative, cooperative) of the different students during the pedagogical session. In the first part, we describe deal with the support of the observation task for the teacher during a learning session. We then propose a classification of collaborative indicators as well as concrete examples from a real experiment achieved with students in our University. For immersion purposes, we represent these indicators by particular symbols such as coloured "auras" inserted inside the game itself.

Keywords: Collaborative indicators, collaborative activity; learning environment; online multiplayer game; trace observation

Playability: The Secret of the Educational Videogame Design

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Abstract: The use of new technological and learning methods helps us to improve the learning process. It has produced the inclusion of the videogames as active elements in the classrooms. Videogames are ideal learning tools since they provide training skills, promote independence, increase and improve students' concentration, attention and social connections. But the use of videogames in Education shows us important problems: most of educational videogames are mainly multimedia didactic units which have lost the essence and attributes of videogames and they use devices that do not raise children's interest like other specialized devices.

The present work describes our experience in the design and use of videogames as new forms of human-computer interaction. We develop serious games for children used as didactic learning tools for pupils: Player Centred Videogames. We will review the meaning of the concept "Learning by Playing, Playing to Learn", and how it can evolve to include games as tools that support pedagogic development. The main child activity must be playing. The consequence of this action (playing) is that the child learns educative contents in an implicit way. We will describe how to introduce the educational contents into a game structure and how to design the videogame to make it the most suitable as possible to users/players to improve the Playability.

In this work we will show Playability as a set of properties to describe player's experience in a particular game system. A good playability is a factor that every game must get, because it reflects player's pleasure, experience, sensations and feelings when users are playing videogames. We will describe different playability's facets that allow us to define the global playability of a videogame and to simplify the analysis of each playability factor. Using playability as main concept/keystone, we will introduce our Player Centred Videogames Design Methodology where we will describe our playability style guide to satisfy the playability requirements of a videogame.

Finally, we will show an example of our methods in a didactical videogame to learn the vowels on Nintendo DS: "Leoncio and the Lost Vowels Island".

Keywords: Videogames design, playability, education, user's profile, user centre design

"Finger On The Screen": Using A Strategy Video Game To Mediate Curricular Learning

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Abstract: A multidisciplinary university team (Chilean-Spanish) and teachers at a public school in the region of Valparaíso (Chile) carried out an initiative to design and implement an educational sequence that, by including the use of the strategy video game Age of Empires in their activities, could mediate curricular learning in the subject areas of social science and mathematics. The application of this class design involved working with 78 students at K7 level, who made use of the video game in three ways: levelling, inquiry and evaluation. A descriptive case study methodology was used to compile and analyse data in order to identify and describe the sessions and the interaction types occurring in the relationship between peers, the role of the teacher and the contribution of the video game. The main results show, on the one hand, how important it is (i) for teachers to learn how to play, (ii) for them to take part in a co-operative forum to design new settings for learning, and on the other hand, (iii) the types of collaboration and co-operation emerging among students, and (iv) the opportunities offered by the video game to approach the facts of phenomena.

Exploring the Discrepancy between Educational Goals and Educational Game Design

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Abstract: This paper aims to explore and discuss the discrepancy between educational goals and educational game designs through a theoretical and empirical lens. It is assumed that this discrepancy is a general problem that must be addressed more critically by educational game designers and researchers. The paper is structured in three parts. First, we present a meta-theoretical framework for understanding the relationship between educational goals and game designs. Second, we present an empirical case taken from a game session with the educational video game *Global Conflicts: Palestine* (Serious Games Interactive 2007), which offers pupils the experience of exploring the Israeli-Palestinian conflict through the eyes of a journalist. Here, we will mainly focus on the pupils' perception of the "quotation" and "article" features of *GC:P*, which highlight the discrepancy between intended educational goals and actual game design. In the third part of the paper, we will relate this problem to the broader scope of educational game research.

Keywords: Educational game design, social science education, socio-cultural learning theory, multimodal discourse analysis

ThinknDrinkn? – An Evaluation of the use of Games Based Learning (GBL) for Alcohol Awareness

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Abstract: While computer games have been phenomenally successful within the leisure industry with their inherent ability to motivate, engage and inspire, their application for educational purposes has had limited success. However, a recent project called ThinknDrinkn? has proved successful with educationalists, policy makers and children alike.

This paper reports on a project undertaken with 12-13 year olds that used GBL as an aid to teach children about the dangers of alcohol abuse. The project enabled children to participate in brainstorming sessions to develop the game concept, determine suitable game genres and consider appropriate content for a game that could teach about the dangers of alcohol abuse in a 'child-friendly' manner. Additionally, this project enabled two schools to successfully collaborate and helped pupils work across a variety of school departments, with the School of Computing at the University of the West of Scotland, the police force and the National Health Service.

The pupils were at the heart of the project as they guided the development path by providing suggestions and ideas for the game that they believed their peers could relate to. The pupils also wrote and recorded their own song to go with the game, which has received airplay by local radio stations. In turn this has acted as an advertising campaign for the game and the project.

This paper discusses the project in detail and reveals the results of an evaluation that was carried out with teachers and pupils involved in the project. It is apparent that GBL is certainly an engaging and motivational approach for working with children and reaching out to them about important social issues. The results support the stance that GBL can benefit the learning experience and aid learner comprehension. It has also validated the view that formal teaching and learning styles are beneficial in some areas of the curriculum, thus reinforcing the importance of a hybrid set of methods to improve the learning experience for learners.

Keywords: Games-based learning, secondary school, learning, alcohol abuse, education

A Framework for the Development, Design and Deployment of Customisable Mobile and Hand Held Device Based Serious Games

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Abstract: Parallels between good gaming and good learning experiences [Gee, J. 2003] suggest the use of computer games in the education sector. This paper illustrates a framework to aid in the design, implementation and deployment of mobile device based serious games. Key concepts of games based learning are identified and an argument is made for the use of mobile technologies as platform for serious games. The proposed framework specifically considers the formalisation of learning targets, the assessment and evaluation of the game and the players alike as well as how to personalise games to suit individual players. The overall framework and the individual steps are illustrated and the reader is provided with instructions as well as examples of games and applications that can (and have) benefited from the framework.

Keywords: Framework, games based learning, mobile device, implementation, design, assessment, evaluation

Therapeutic Games: Work Should Not Be This Much fun

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Abstract: Games are the language of children. Give them a dice and a few squares on a board with a bit of fun thrown in and they will play with you for hours. Games have been integral to human culture throughout history as evidenced by ancient philosophies and archeological finds in Egypt, Greece and Rome. This paper supports 'games-based learning' as an effective strategy for teaching socio-emotional skills to children and young people. The theoretical bases to this approach lie with educationalists and psychologists and reach as far back as Aristotle and Socrates. Essentially, games are a social experience with potential to provide meaningful interactions and connectedness and the opportunity to develop a prosocial skill-set for meeting future challenges. Social competence and emotional resilience are critical in a changing world that relies increasingly on collaborative approaches to learning and the workplace. Opportunities are needed for students to develop prosocial skills and to have positive experiences in order for them to feel connected to their school communities. Therapeutic games provide such a forum: a safe 'experiential' environment in which to talk, listen, role-play, observe peers and explore values and attitudes.

Children and young people are often referred to psychologists and support teachers for problems with aggression, peer relationships, emotional regulation and teasing and establishing rapport can be tricky, especially if the student is oppositional and does not want the extra attention being provided. Games quickly disarm resistance, especially if there is a small group of peers with them. Before they know it, they are having fun, talking and learning new skills. Therapeutic games are specifically designed to present concepts that support social and emotional wellbeing in ways that engage young people. This paper also discusses the skills, strategies and attitudes that facilitators need to make game sessions beneficial to all players. As referees facilitators ensure games are safe for players and proceed in an orderly manner. As teachers they look for opportunities to 'scaffold' learning experiences in the *zone of proximal learning*. As coaches they debrief players to enhance learning and reduce harm. The Life-Space Interview and Emotional First Aid are presented as debriefing tools to use during and after a game. Levels of intervention in school settings and types of children that may benefit from this approach are also discussed.

Keywords: Experience-based learning, socio-emotional skills, resilience, therapeutic games, facilitation

Cognitive and Affective Effects of Learning History by Playing a Mobile Game

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Abstract: In this paper, we report on research into a mobile game about medieval Amsterdam. The objectives of the paper are to generate insights into how mobile game-based learning in secondary education affects pupils' knowledge of medieval Amsterdam, their motivation for History and for the subject of Middle Ages, and their attitude towards collaborative learning. We investigated the effects of a game called Frequency 1550. Frequency 1550 is a mobile city game developed by the Waag Society in which pupils playfully acquire historical knowledge about the medieval city of Amsterdam.

A quasi-experimental design is followed in which data have been gathered on the process of gaming and learning of 458 pupils from twenty classes of five schools. Qualitative and quantitative data have been gathered. In this paper the focus will be on the quantitative data. Pupils of ten classes played the mobile history game, whereas the other pupils followed regular project-based lesson series (control condition) especially designed for this project in strong co-operation with five History teachers from the participating schools. The results show that, on average, pupils of the game received higher scores on the knowledge test on facts about medieval Amsterdam than pupils who followed regular project-based lessons. No significant differences were found between the groups regarding narrative knowledge, motivation for History and for the subject of Middle Ages, and attitude towards collaborative learning.

Keywords: Game-based learning, mobile learning, learning effects, motivation, collaboration

From Simulation to Imitation: New controllers, New forms of Play

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Abstract: In this paper, we briefly outline some of the early research in the field of digital games and education that attempted to answer the question of what and how people learn from playing games. We then turn to the recent revolution in gameplay controllers (from the classic controller to the Wii wand, plastic guitars, microphones and even plastic drums) to argue that gameplay has only just undergone a significant epistemological shift, one that no longer sees gameplay as the simulation of actions on a screen, but instead enables imitation as the central element of gameplay, perhaps effectively for the first time giving players access to a form of play-based learning relegated to the very young. This radical modification of the way games are played, from simulation to imitation, has already attracted new audiences: in Japan, female players exceed male players on the handheld Nintendo DS, in the U.S. and in Canada and elsewhere seniors' homes are purchasing the Nintendo Wii (with its suite of sports games) to encourage residents to exercise, and one of the hottest selling games of December 2007 was *Rock Band*, a game in which players form a band and play using a "guitar", drums and a microphone as controllers. Playing games is not a "solo" act: the player is both acting and acted upon by the technology, and his/her play is very much situated within a broader network of actions, actors and activities which are community-based and supported.

The question of what and how players are learning in games has been at the forefront of research on education and gameplay in the last several years when we began to ask what and how people learned from playing commercial entertainment-oriented digital games. Long viewed as artifacts of an "*un*popular culture," particularly by educators and educational theorists, commercial videogames are now recognized as highly effective learning environments where player (as learner) agency is paramount, and where the acquisition of knowledge and competency is infused in engaging and pleasurable play, not a prescribed task (de Castell and Jenson, 2003, 2005; Gee 2003, 2005; Prensky, 2006; Squire, 2002). As such, the primary argument for the paper will be to examine new controllers not as simulative experiences, but as technologies that support players' *embodied* competence, rather than players' ability to *simulate* such competence.

Keywords: Play, digital games, hardware, learning environments, education

Exploratory Learning Through Role Playing Simulation Games in e-Business Education: Experiences with the Beer Game in the University Education

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Abstract: This paper reports about the experiences with the beer distribution game online, which is a web based simulation of the supply chain. The game was developed by System Dynamics Group at the MIT in the early 1960s. The beer game, played all over the world by thousands of people ranging from high school students to chief executive officers and government officials, simulates a supply chain from industrial fabrication to the retail distribution. The simulation game shows the building up and reinforcing processes of demand fluctuations within the supply chains. The simulation is a realistic platform in order to experience the behaviour of distribution chains. The participants of the beer game have to decide which quantities of beer barrels they order. They learn about the difficulties to define the proper quantities, which match the demand. The original beer game is a board-based gaming simulation. Four persons or teams play the game. They occupy the roles: factory (brewery), distributor, wholesaler and retailer and create a four-tier supply chain. The only way of communication between the actors is by placing orders and dispatching lots. By doing so the participants make experiences about the bullwhip effect in the supply chain, which is one of the main reasons for inefficiencies in supply chains.

The aspects of human behaviour are one of the reasons of the bullwhip effect. With role playing simulation games these aspects of human behaviour are shown to the participants of the game. This kind of game provides the possibility to learn about complex situations. The participants of the game are not only a learning group but also a group of practitioners who have to make decisions in order to solve a real problem. The link between the complex structure (of the supply chain) and human behaviour is reflected in the game.

The role playing simulation game was applied in university education for e-business management. The students learned with the beer game the complex connection in the supply chain. Two groups of students played the game. One group had as a major e-business management, the other group were bachelor students of business administration who joined an introductory course in information processing where supply chain management was one topic. The differences in the strategies and the results of the game were compared. For the evaluation study the students additionally described their learning experiences in a weblog.

The feedback of the students on the game was positive; they liked the different teaching methods. For learning it is important to have enough time for the last phase of the game, the debriefing and the discussion on the results. The decisions and the group dynamics were discussed which is very important for the learning process.

Keywords: Problem based learning, role playing simulation game, beer game, bullwhip effect, business education

The Effects of Individualized Feedback in Digital Educational Games

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Abstract: A crucial factor for successful digital educational games, particularly for older children and adolescents, is balance between learning and gaming and also balance between challenge and ability. These factors are important to maintain fun, immersion, flow experience, and motivation – the motivation to play and therefore to learn. A special challenge in this context arises from the need for pedagogical support during learning - and therefore during gaming. At many rungs of the learning ladder, support and feedback is necessary in order to ensure successful, effective, and complacent learning. Considering the importance of not destroying immersion with the game, the assessment of the learning progress and psycho-pedagogical feedback must occur in a non-invasive way. This requires an intelligent system that is capable of assessing individual competencies and learning progress by observing and interpreting behaviour within the game. In ELEKTRA, a project funded by the European Commission we developed a formal cognitive framework for the non-invasive assessment and interventions within complex learning situations, that is, micro adaptivity. Attuned to the assessed competencies, meaningful feedback, for example hints, suggestions, reminders, critical questions, or praise, can be triggered, without destroying the gaming experience. Two questions arise with respect to feedback. First, does feedback, although designed to be non-invasive, on educational issues impair gaming experience? Second, can feedback in gaming situations facilitate the learning progress or does it increase the learner's cognitive load, which was suggested by several researchers. In the context of the ELEKTRA project, we implemented the theoretical framework of micro adaptivity in a game demonstrator. In this work, we present results from an evaluation session. The results indicate that (micro) adaptive interventions (i.e., appropriate and meaningful interventions/feedback for an individual learner, his/her knowledge and learning progress) are superior to neutral (i.e., non-individualized but semantically correct interventions) and inappropriate interventions (i.e., non-individualized, unsuited interventions) in terms of learning and gaming measures. In addition, we analysed the relationships between learning progress and socio-emotional variables. The results indicate that adaptive feedback not only facilitates learning but also attitude and immersion.

Keywords: Technology-enhanced learning, game-based learning, feedback, didactic interventions, micro adaptivity, evaluation

Reflection Walkthrough Method: Designing Knowledge Construction in Learning Games

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Abstract: Research has shown that the quality of learning games produced has not met the standards and needs of end users. Thus, there is a need to develop learning game design methods that better take the needs and preferences of different end users into consideration, than do current industry practices. The main aim of this paper is to present a method called Reflection Walkthrough that can be used to find game designs that activate the reflection process in learning games. Reflection Walkthrough is an expert evaluation method conducted by educational technology experts. In Reflection Walkthrough, the evaluator aims to locate cognitively problematic issues, as well as to discover ways of providing more effective forms of cognitive feedback, thereby stimulating players to reflect on their problem-solving strategies and solutions created. The paper presents the progress of Reflection Walkthrough, from preparation to recommendation formation. Furthermore, eight experts evaluated the method by conducting a walkthrough for the game, Media Detective. According to evaluation results, Reflection Walkthrough appears to be a promising method that facilitates user-centered learning game design. However, more research in different kinds of contexts and with games in different developmental stages is needed in order to validate the method and empirically prove its usefulness.

Development of Competencies by Playing Digital Sports-Games?!

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Abstract: The idea of digital game-based learning (DGBL) is that students (or players) learn something by playing a computer or video game and that an educator can employ digital games to assist and boost both formal and informal learning. There is game software that is not specifically produced for educational use but which is nonetheless regularly implemented in educational settings by educators. These so-called COTS (commercial off-the-shelf) games are particularly effective in socialization processes. COTS sports computer and video games can be divided into three main categories: sports simulation games, sports arcade games, and sports management games. After taking a closer look at these sports computer and video games, specifically sports simulation games, it is possible to posit dimensions of competencies that are developed by playing those games. Various examples for each dimension of competencies can be generated: Motor competence, cognitive competence, meta-cognitive competence, social competence, emotional competence, personal competence, media competence. Furthermore, examples of implementing digital sports-games in physical education can easily be generated. After comparing the postulated dimensions of competencies of COTS digital sports-simulations with those of "real" sports, the following question arises: are their respective educational results comparable?

Commercial Video Games in Educational and Multimedia Contexts

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Abstract: One of the challenges that face us when we try to bring into the classroom commercial materials such as videogames that can be used as educational tools, is to identify appropriate strategies of collaboration with teachers, families and even whole industries. This paper explores how multimedia contexts can be created, in which children turn into active participants in a digital universe in which multiple technologies are present, with the result that videogames are just one of several digital tools. But much more than just the technology needs to be taken into account; we also need to consider the specific content and information embedded in new digital media. This is where the concepts of *digital literacies* and *situated cognition* turn out to be particularly interesting, especially when we consider how schools have traditionally worked according to an established curriculum that is very detached from everyday life. The study is based on a *qualitative analytical perspective based on narrative and ethnographic approaches*. We carried out our research in the course of eleven two-hour sessions of a multimedia workshop in a Spanish public school in which the teacher, children and researchers participated. We worked once a week for eight sessions for about two hours/session. There were 16 boys and girls between seven and eight years of age. Two main results need to be considered. The first tells us that *introducing commercial videogames into the classroom was a complex task, and that* four different dimensions influence the use of videogames as semiotic and educational instruments in the classroom: a) The educational strategies used by the teacher; b) how videogames can be combined with other new and old technologies; c) the use of PlayStation 2 in the classroom as a well-known motivational tool for the children but unknown and new to the teacher; d) the relationships that children established between real and virtual basketball games. The second result enables us to define several levels of complexity of children's descriptions of their own activities in relation with the game; references to the game's dynamics, considering both material aspects of the console and specific rules of the digital game,are displayed by expert gamers. Our main goal at present is to design digital materials capable of supporting teachers' and families' use of games, and in particular, to reveal the rules that organize their structure, codes and symbolic universe.

Keywords: Commercial videogames, new literacies, real and virtual life, children's games

Homeless: It's No Game - Measuring the Effectiveness of a Persuasive Videogame

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Abstract: In recent years a new videogame genre -- persuasive games -- has begun to emerge. Persuasive games, which include advertising games, health games, social and political advocacy games, differ from educational games in that their aim is not to teach but to change attitudes and behaviour -- to discourage smoking, to increase votes for a political party, to encourage recycling, etc. To date, there is little empirical evidence for their efficacy. The videogame Homeless: It's No Game was developed to determine whether people could be persuaded to become more sympathetic to the plight of the homeless by playing the role of a homeless woman in a videogame and whether this persuasive effect could be measured. Volunteers were recruited through the Internet to answer a survey of attitudes towards the homeless and were then assigned to either play the game, read a short story about homelessness, or to be part of a control group, after which the survey was re-administered. Results were mixed, with some indicators showing an increase in sympathy towards the homeless and others showing no significant effect. Anecdotal remarks by participants also displayed this ambiguity with some participants indicating the game did increase their sympathy while others were unaffected. There were also some indications that playing the videogame led to a strengthened belief in the effectiveness of videogames in raising awareness of social issues. The results indicate that persuasive games can be effective, especially if their audiences consider them realistic. However, more research is needed.

Keywords: Videogames, persuasion, serious games, homelessness, persuasive games

Computer-Based Business Simulation Games as Tools for Learning: A Comparative Study of Student and Teacher Perceptions

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Abstract: Computer-based business simulation games are used in business courses in many universities. In this study, we explored the drawbacks and benefits of use of such games in business courses from both the teacher and student perspective. The results are based on interviews, questionnaires and class observations. It was concluded that teachers see simulation games as good tools for learning. However, many students are not satisfied, since they are expecting more feedback and support from teachers when they are using the game. Although games are supposed to reflect reality, many students did not agree. In conclusion, we suggest critical success factors for the use of computer-based simulation games in business courses. Among other factors, we argue that it is important to arrange an introductory activity. Moreover, the design of assignments and activities are keys in ensuring that the benefits of simulation games are realized.

Keywords: Simulation games, business simulation, learning

Ludicity. A Theoretical Horizon for Understanding the Concepts of Game, Game-Playing and Play

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Abstract: The promotion and development of learning based on games and playing must be supported by a unifying theoretical structure that will allow for: contextualising and clarifying the various concepts involved, particularly those of the game and the toy, playing games and play, distinguishing between the characteristics of each of these manifestations; establishing a connection between the types of ludic interaction that are dominant in each of these manifestations and highlighting the nature of the relationship that each of the manifestations has with the others. This theoretical structure will suggest a design framework for projectual ludicity, which may guide the creation of a range of interventional and research methodologies, which is essential for the promotion and development of learning activities that are based on, or which make use, of ludicity.

Given that the proponents of the multiple and diverse theoretical and practical approaches to the game, the toy, playing games and play attribute an identical meaning to such distinct actions as play, playing games, games and toys, understanding these theories, and the reality which they are intended to analyse, becomes somewhat more difficult. As there is no existing unifying theoretical framework, the author of this paper has built up the conceptual structure known as ludicity, rooted in the work done in the pragmatics of human communication by Gregory Bateson (1972), (1979), (1956), (1955), Paul Watzlawick, Janet Beavin and Donald Jackson (1967), Edward T. Hall (1959) (1983), Stuart Sigman and Cronen (1995).

This article introduces, for critical review, the conceptual structure that enables both an understanding of the diversity and multiplicity of those experiences that result from the human and social condition of ludicity, and an anticipation of the effects arising from such experiences. Ludicity is communication, learning and change.

Keywords: Ludicity, consequentiality, game, toy, game-playing, play

Students and Video Game Players

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Abstract: Some studies show that video games are used in teaching (Foreman 2004) and others report on players learning through their leisure activities online (Perriault 1987; Berry 2007), as formerly was the case through ordinary games. Even though the latter have been recognized by many researchers as leisure activities (Natkin 2003; Lafrance 2006), they were already used as learning tools (Brougère 1995, 2004).

However, since the beginning of time, play has been more or less directly opposed to work (Caillois 1967; Henriot 1989). The term "work" can be related to the notion of school work for children and adolescents, and to academic work for young adults. But, if for the former, parental and teacher supervision proves to be sufficient so that game playing does not encroach too much upon school work, what are the effects when institutional and parental frameworks are less evident?

Such is the situation in which most university students who play video games find themselves. In fact, recent studies mention the risk that these young adults who play on the Internet could potentially put less effort into their studies to spend more time playing on-line games (Valleur 2003; Griffiths 2004).

This paper presents part of the results of a study being done for a doctoral degree in Education, using a psychoanalytically-oriented clinical approach (Blanchard-Laville, Chaussecourte, Hatchuel et Pechberty, 2005). My research analyzes students' psychological investment in video games and their game-study relationship. The objective is to show, through the in-depth analysis of three non-directive interviews done with student gamers, how video games are experienced as leisure tools, but also as learning tools at the same time. For the first two students, their intensive use of video games, which became their object of study for a time, was transformed into what we can call addictive. However, in the end this particular experience of video games permitted them to better come to know themselves. As regards the third student, video games are for her as for her mother informal tools for leisure and learning which do not conflict with her studies.

Keywords: Students, gamers, video games, clinical approach, learning

Designing Serious Games for Computer Assisted Language Learning – Teacher/Learner Perspectives and User-Centered Design

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Abstract: In this paper we shall discuss the potential of educational games (Serious Games) for teaching and learning English online focusing on user engagement, performance and design. The focus of the paper will be on how the designed space of a platform for learning English in primary school (www.mingoville.com) produces teacher and learner participation and involvement in the context of a formal learning environment. How do teachers and learners respond to the educational design of the platform in question and how do they perform language learning through the game-based design of the platform? The paper will build on data from a research project, *Serious Games on a Global Market Place* (2007-2010) in which the Mingoville.com platform has been studied in the context of English as a foreign language in Danish primary schools. The initial research process – which was based on an analysis of the platform as well as interviews with developers – suggested that one of the challenges of developing a design for serious games in language education consists of renegotiating the educational games genre to balance drill-based exercises with contextualised simulations that involve fruitful thinking, real language interaction and learner engagement. The second phase of the research process (piloted in the spring of 2008) involved observations of user responses to the platform in schools as well as interviews with teachers and children. On the basis of the initial results from the pilot project we are proposing that performance and engagement through Serious Games for language learning should be understood in the context of gaming and learning as both separate and interconnected processes in which the teacher has a central role as mediator.

Keywords: Game-based learning, call, serious games, teachers' roles

Virtual Work Experience: From Classroom to Workplace

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Abstract: Choosing the first job or selecting a career is a critical step for a modern teenager. Short term placement within an actual work environment has proven to be a powerful means to equip young people with an understanding of the workplace. All Scottish school students are encouraged to undertake such a placement, usually for two weeks, and the school careers and guidance staff are tasked with facilitating this. However, in countries like Scotland where some of the population lives in remote locations including the highland and islands, work placements are often difficult or impossible to provide. Even for city dwellers, relevant work placements are in short supply.

Using virtual environment technology deployed over the internet, we introduce a means to provide a wide variety of work experiences to young adults, who would otherwise not have the opportunity within their neighbourhood. The brainchild of Highland and Islands Careers Scotland, as a means to address the above difficulties, this project is a collaboration between the Virtual Work Experience Project Board (a partnership of Learning & Teaching Scotland, The Scottish Government, Determined to Succeed, Careers Scotland, Skills for Business Network and BT Scotland), Glasgow School of Art's Digital Design Studio, Blue Diamond consultancy and Albarphotomedia. It brings together expertise in developing and deploying new teaching technology, careers specialists and educationalists, with specialists in 3D content and web technology. Together we have developed a suite of virtual worlds which evoke real working conditions, not just the physical environments but with interactions with real people (via video interviews) and real processes (via practical narratives). If teenagers living in remote communities or considering their futures at home with their parents are to have access to this experience, these six worlds - containing more than seventy 'avatars' of real working people - must be deployed across the Internet via any reasonable connection. In a school setting, hosted on local proxy servers, they may be accessed by tens of students at the same time.

The research challenge was to balance the need for compact and controlled data delivery with game-standard immersive experiences. Our solution comprises strategically designed and executed models and a clever selection of robust web technologies as will be described and demonstrated in this paper. The quality of the modelling, the direct human contact of the interviews and the ready availability of career-guidance material in the surrounding Web combine to provide an effective solution to this socio-geographic problem. Repeated field tests in schools, resulted in widespread acceptance and enthusiasm. Game-players like the 3d worlds and the challenge of exploration; non-game-players like the personal contact with real people. Everyone appreciates the breadth and variety presented by these virtual experiences. The development of further worlds is planned. The project raised many issues around the key learning objectives and the effectiveness of the media in achieving these within the cost constraints imposed. Further testing and research is planned, to look at the optimal use and effectiveness of this technology within learning and teaching.

Keywords: Virtual, school, education, social, career, game

XML Application for Educative Games

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Abstract: New technologies are providing us with different alternatives to transfer knowledge on a daily basis. Educative games, as a form of active knowledge transfer, show great potential. There are several approaches to the development of educative games. Usually, which ever approach do you choose, the process of creating an educative game automatically implies a strong communication bond between the game designer and the expert for the area from which the knowledge is integrated in to the game. The goal of this paper is to suggest a new approach to educative game defining that would result in separation of these two roles, thus giving the opportunity to both actors to perform only the activities within their own specialty. By creating two separate software modules, it became possible to resolve the communication conflict between the game designer and the knowledge expert. As a result of such game defining, we create a specially structured XML document that contains game objectives, description, assignments, and reference to graphical environment, as well as knowledge inserted from our knowledge repository. Also by the use of XML document we can create different game types simply by following a specific XML schema. By applying a plug in pattern we can make our game engine expandable with a variety of game types. This gives us the opportunity to create many different games, created specifically for a certain knowledge topic, that incorporate the graphical environment that correlates to it. The process of game creation is simplified in that way, made more efficient, and in the end, more interesting. As proof of our concept, we developed complete software, which enables the game designer to create and define an adventure game, the educator to create specific learning objects for the specific domain of knowledge and the student to be involved in an educative game via Internet. By the use of this software, we hope to encourage teachers and different types of educators to use games as a tool in knowledge transfer. This will provide students another alternative instead of the traditional form of learning, which is much more interesting and more motivating.

Keywords: Game-based learning, knowledge and game separation, e-Learning software, XML

Experiences in Using XBeerGame Virtual Gaming for Learning Supply Chain Management

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Abstract: Supply chain management (SCM), due to the large scale and wide scope of the multi-partner supply networks and to the high complexity of the dynamically occuring phenomena, is a difficult topic to teach. Conventional teaching approaches do not allow the students to sufficiently grasp neither the interrelationships between the elements of such a complex system nor the dynamic effects. SCM teaching has therefore a lot to gain from the use of learning-oriented virtual games.

The XBeerGame is an immersive simulator enabling students to learn how to master the bullwhip effect through improved decision support, visibility, cooperation and agility. It can be calibrated by the teachers in order to get the students to learn by experience specific characteristics and behaviours of supply chains. The software technology used in the XBeerGame allows it to be used in a decentralized way and in particular with international student teams. The highly developed visual interface of the XBeerGame and the access to the game results favour its use for student tournaments and provide a large choice of pedagogical approaches.

The XBeerGame has been used in teaching students at the Bachelor and Master levels as well as in continuous education in both North America and Europe. The pedagogical experience gained and the evaluations of these effective uses have led to several interesting conclusions as well as to further improvement proposals, for the tool itself as well as for the methodologies and pedagogical scenarios.

This paper describes the key functionalities and characteristics of the XBeerGame. It then discusses its use in various teaching programs in Canada and in Switzerland. Based on these international hands-on experiences, the use of XBeerGame for SCM teaching is discussed. The tool itself is a point of discussion, but more importantly, the way it is integrated into a pedagogical scenario seems to be the key to an optimal use. It appears in particular that combing a discovery learning approach based on the XBeerGame with a more formal, mathematical description leads to interesting pedagogical results.

Keywords: Supply chain management, learning oriented gaming, bullwhip effect, piloting cockpit, immersive simulation

The Impact of Using Guess and Tell Games on Students Achievement, Interest, and Gender Discrimination in the Teaching of Mathematics

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Abstract: This paper is the result of pre-test, post-test single group experimental research about games based teaching approach, carried on in the small town of NWFP, Pakistan. This paper describes how Guess and Tell game was used as a source of teaching mathematical concepts, Mean and Mode to the elementary school children. The paper shows the use of the game as a tool in the class room for bridging the gap between male and female students for giving equal opportunities to participate in the game.

The paper focused on questions like (1) whether 'Guess and Tell' game is fruitful in improving students' achievement? (2) Is it increases students' interest in Mathematics? (3) Is it helpful in minimizing gender disparity? The pre-test and post-test results of this research reveal that variation exists in the achievement level and interest of students. On the basis of the results in this paper it is clear that there is a significant difference between the achievement level of male and female students. The findings of the study also explores that the game implemented in the class made positive changes in the perception of students towards Mathematics.

On the basis of the findings the researcher suggests to investigate more dimensions in using the game, 'Guess and Tell' in the class room.

Keywords: Guess and tell game, achievement, interest, gender discrimination

Videogame Aesthetics and e-Learning: A Retro-looking Computer Game to Explain the Normal Distribution in Statistics Teaching

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Abstract: It is a generally held view that fear is a significant barrier to students' learning statistics. The aim of this application was to develop a computer game that explains an important statistical concept – the normal distribution. We produced a Flash application comprising a demonstration animation, game mode and brief tutorials that guide the student through important properties of the normal distribution. We created friendly looking retro-style characters contained in a complimentary environment to engage the user and decrease sensations of threat. The game's role was to reinforce learning outcomes and check understanding through the addition of performance-based content.

The application was piloted on first year psychology undergraduates and evaluation was collected with an e-questionnaire administered via the www. The evaluation results were positive overall: Students felt that they had learnt the basic properties of the normal distribution that we intended. In addition to this 89% of students perceived the use of characters (i.e. the videogame aesthetics component) as friendly and appealing. From this we can conclude that there was confirmation that employing videogame aesthetics worked to reduce sensations of fear associated with statistics.

Keywords: e-learning, games based learning, statistics, normal distribution, videogame, Adobe Flash

Player Transfer: How Learning Transfer and Serious Games Answer Serious (and Transferable) Questions about One Another

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Abstract: This article suggests that research into the use of digital games for learning provides a fresh perspective on the concept of learning transfer and that equally serious game researchers and developers may have important lessons to learn from historical and contemporary transfer research. This paper, after broadly sketching the convergence of these two research fields, examines in more detail a number of important specific topics, as follows:

- the belief, implicit in many of today's serious game products, not only in the reality of learning transfer but in the ability of such products to facilitate it. Included here are a range of, it would appear, successful initiatives in the military/defence and medical fields and also a number of more recent "brain training" titles which lay claim to developing transferable key cognitive skills and strategies.
- the evidence for both low and high road transfer in the "everyday" playing of mainstream computer and video games
- the manner in which the affordances of modern computer and video games match the conditions for learning transfer posited in the literature in the field (e.g. multiple contexts for practice, metacognition)

Despite such promising indications, empirical data, where it exists, fails to establish the 'transfer power' of games. One reason may lie in the fact that many of the experiments carried out to study learning transfer – and/or just plain learning – from games are based on a 'one-shot', 'in vitro' approach similar to that taken in many classic transfer experiments. The author suggests it may not be realistic to expect transfer or significant learning to happen under such conditions and that the development of transferable learning is most likely based, like the development of expertise, on a certain, and perhaps considerable, amount of reflective and deliberate practice. The paper concludes with a discussion of the implications of this thesis for the study of transfer in and from digital games and, by extension, to the study and facilitation of other forms of digital game-based learning.

Keywords: Learning transfer, digital games, game-based learning, serious games, practice, expertise

3D Games-Based Learning Environments in Northern Ireland Classrooms: What do the Teachers and Pupils Think of This Technology?

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Abstract: 3D games as learning environments are widely believed to have potential benefits for the classroom, such as increased motivation and engagement, and to improve learning outcomes. But what do pupils and teachers in Northern Ireland think about this technology?

The aim of the study was to address this research question, and to observe the level of collaboration and the dialogue of small groups of students as they interact while playing the game.

Both qualitative and quantitative methodologies were employed. Five schools (1 class from each school) across Northern Ireland participated in this research, using custom designed 3D games. Ninety-eight 11-14 year old pupils (23 boys and 75 girls) were surveyed, using a self-rating questionnaire. Subsamples (25 pupils in groups of 2/ 3) participated in video recorded observations, while they used the games. In addition to this, 4 teachers were interviewed and 12 participated in focus group discussions.

Overall, the results revealed positive attitudes amongst teachers and pupils towards games-based learning. Observations revealed collaboration between the pupils, but highlighted how technical issues within the game can minimise the quality of thinking and dialogue taking place. The results also revealed gender differences across views and opinions, as well as highlighting differences in how teachers integrated the technology, which subsequently resulted in differences in pupils' attitudes towards the games across the different schools.

The results revealed that the potential of games to increase motivation and to improve learning was recognised by both teachers and pupils. The importance of the teacher's role was highlighted and how the implementation can affect pupils' attitudes, demonstrating the value of the teacher in determining the success of games-based learning. These results are important both for researchers and educational practitioners.

Keywords: Games-based learning, teachers, pupils, attitudes, learning, motivation

Design of Educational Multiplayer Videogames. A Vision From Collaborative Learning

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Abstract: Most of the studies carried out have proved the convenience of incorporating the New Technologies into the educational process from the earliest ages. One of the possibilities that New Technologies offer is the use of videogames as a learning tool. Videogames are an attractive environment with the positive aspects of playing a game. In this way, pupils increase their cognitive skills, the time dedicated to learn, their motivation for learning, their concentration and their attention while they are working. In this work, based on the studies that plead for the benefits of videogames as excellent educational tools, we have analyzed the design of educational videogames for activities in group.

Our principal aim is to facilitate the incorporation of collaborative learning techniques and tools into the videogames design and development to make more effective the model of learning in group without losing the playability. In order to achieve it, we present a set of general design guidelines that allows us to incorporate the characteristics of collaborative learning in the videogame development process. To make them, we have taken into consideration five characteristics of collaborative learning: positive interdependence, personal demand, face-to-face interaction, interpersonal skills and self-analysis of the group.

As a practical example of our proposal, we have designed an educational videogame for playing in group, with collaborative elements and activities that permit to resolve the game challenges while the educational contents are achieved in an easier way than individual learning. This videogame reinforces the process of teaching vowels in the first moments of schooling. Each group has five players, and each of them will carry out the necessary activities to learn a vowel. While the game progresses, the students will get utensils that they will utilize jointly with their teammates' utensils to solve common game challenges.

Keywords: Design of educational vdeogames, CSCL, collaborative systems, e-learning

Applying Online Multiplayer Educational Games based on Generic Shells to Enhance Learning of Recursive Algorithms: Students' Preliminary Results

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Abstract: This paper provides a methodology for the implementation of an online multiplayer educational game during a virtual classroom. We investigate the students' preliminary results of applying a multiplayer Educational Game to enhance learning of recursive algorithms. The game was provided during synchronous tele-educational service complementary to f2f lecturing in the compulsory (first semester) course "Algorithms with C" of the Department of Applied Informatics at the University of Macedonia, Greece. The Recursion game was embedded in one of a series of synchronous virtual classrooms, the Tutoring Tele-Meetings (TTMs) for complementing face-to-face classroom instruction in conventional higher education with methods and tools of Open and Distance Education. Virtual Classrooms were implemented on CENTRA Symposium platform, through the server of the Hellenic Open University. Educational games were created on the Online Educational Games Central (EGC) of TELUQ University of Quebec, Canada. Savie's online EGC was designed as a virtual meeting-place for those interested in using games for educational purposes. Teachers can choose between either using pre-defined available games. Teachers need to add the content based on pre-determined objectives to generate a new educational game adapted to their audience. Our goal using a synchronous educational game was to provide our students with the opportunity to our students to work together, to review, to ascertain misunderstandings and to integrate what they have learned about recursive algorithms. Thirty three (33) undergraduates of first semester "played" the web-based educational game "Recursive Algorithms", which was created based on the "Snakes and Ladders" shell. The usability of integrating an educational game based on EGC platform in virtual classrooms, the students' motivation and their perceptions and attitudes were investigated. In details, the way how students faced up the "game" educational approach and their results in the final examination were combined. The first result showed that the interaction between students via educational games is a valuable learning experience. Online games based on EGC platform constitute an important medium in Computer Science education especially for novice undergraduates. Future plans include further developing of two more games with different shells in EGC platform. Furthermore, we are looking into the potential of using a game - based approach to create adaptive learning environments to attract students and increase their motivation to learn.

Keywords: Educational game, multiplayer, recursive algorithms, virtual classroom

Articulation of Ecological Values in Alternate Reality Gaming: A Case Study of World without Oil

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Abstract: Jane McGonigal, Participation Architect of World Without Oil (WWO), observes that the power of alternate reality gaming is that players "have to change the way they live their lives. They're not simulating [the game] in a 3D immersive environment, they're simulating it in their own lives." She observes that the result is that players of these games don't just think about change, they make change (McGonigal, 2007). Drawing on this understanding, this paper will contemplate the following questions:

How do we learn ecological values by gaming?

Do ARG environments really have the transformative power to modify human behaviour and thereby improve real-world ecological problems?

WWO is a unique alternate reality game (ARG) in which Web 2.0 technologies are brought to bear on issues of sustainability and responsible citizenship. WWO is of particular interest from a research perspective because the game offers a unique player-created environment that documents the players' collective quest to comprehend and respond to a simulated crisis. Players were immersed in a complex moral dilemma that required reflective thinking and community effort, resulting in many players taking real-world initiative while playing the game.

The purpose of this research is to examine how WWO players interpret and learn ecological values within the context of the ARG form. Data was gathered from the thousands of digital artifacts tagged WWO and analyzed for features of response categorized by: evidence of learning, agency, community practices and response genre. Preliminary findings demonstrate a complex array of forms of player engagement and degrees of "seriousness" of play that might lead to real-world change.

Games like WWO are important cultural spaces that encourage players to think reflectively and learn about environmental ethics, to experiment ideologically, and to turn imaginative ideas into real-world values and ethically conscious actions. This paper aims to expand our understanding of how players engage ARG spaces with a view to contemplating the affordances of such games for sustainability and environmental education.

Keywords: Alternate reality, ecology, environment, values, learning

Enhancing Educational Outcomes Through Games Based Learning: A Case Study

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Abstract: Games Based Learning (GBL) provides an opportunity for teachers and students to explore a range of diverse issues using a familiar and exciting medium. These issues can include solving problems, the history and development of games, social attitudes towards different games, the popularity of games and the significance of design aspects such as colour, characterisation and layout. This paper will focus on the development, delivery and outcomes of a gaming unit for 14 year old boys. Two main areas were addressed within this unit. Firstly, the social influences that impact on games and their development and the gaming culture and secondly, the development of the student IT skills and knowledge of the basic programming structures.

 Critical thinking and planning skills can be addressed successfully using games. The familiarity of the environment provides a more comfortable mode for student discussion. This may include social perceptions, game cultures such as World of Warcraft, classifications and parental perceptions. Research shows that boys are less likely to engage in personal or opinionative discussion. By utilising an environment that is comfortable, students are more inclined to express and support their opinions.

Game development is an effective tool for teaching a range of skills in computer science. The use of game engines provides a structured framework with a visual interface that allows greater focus on code structure and sequence. Students were able to simultaneously develop the interface and the code and evaluate and check as they developed their game with immediate feedback. Project management techniques can be incorporated to effectively deal with and manage time constraints.

Throughout the duration of the unit data was collected from students. Analysis of this data, anecdotal evidence and results from student projects suggest that the use of games as a learning medium approach was successful in increasing motivation and understanding. The games medium also served to help develop student self confidence and problem solving skills.

Keywords: Gaming, learning, educational returns, social awareness, understanding gaming culture

Applying Digital Game Based Learning solutions to the primary and special classroom: results from field studies

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Abstract: This paper documents a number of small-scale DGBL pilots designed and applied in classroom settings by primary education teachers, as practical assignments for a course within the MSc Program "ICT in Education" jointly run by the National and Kapodistrian University of Athens, the University of Thessaly and TEI of Pireaus, Greece.

The first pilot concerns a game-based application on geography topics comprising 5 prototype DGBL implementations developed with tools such as GameMaker©, Macromedia Flash© and Microsoft PowerPoint©. The study took place on a primary school classroom and employed participating observation, focused discussion and questionnaires to evaluates learning scenarios that implicate DGBL, students' attitude and practical restrictions that should be taken into consideration, reporting a success story overall.

The second case involves the application of DGBL material in a classroom of 11 children with serious mental disabilities, in order to investigate whether digital games can provide a pleasant and effective means of learning for children with special needs such as learning difficulties, mental health problems, specific physical and/or developmental disabilities. This pilot has highlighted a number of interesting practical application issues such as game usability, cooperation amongst students as well as amongst educators.

The third DGBL pilot study, concerning the subjects of "History" and "Study of Environment" at the fourth grade of a primary school of Athens with the use of DGBL applications, was designed and created solely by the educators (using Hot Potatoes and Eclipse Crossword software) who applied it effectively in a 4th primary school classroom, having total control on the creation of the game and on the actual application.

Finally, the fourth pilot was realized in two different classrooms, based on color and number games for 6-7 y.o. students and arcade math games for 7-8 y.o. ones, all implemented by the educators. Apart from field observations regarding the limitations and possibilities of DGBL activities in-class, this study has resulted in a number of demographic and qualitative observations regarding students' attitude towards DGBL. These results will be documented, together with the discussion of the overall outcomes of these case studies and the overall experience of DGBL literacy for teachers, as well as their experience on game implementation, design and application of game-based lesson plans in a real classroom setting.

Keywords: Game-based learning, teaching methods, teacher education, case studies and best practices, special educational needs

Cultivating the Respectful Mind with Games and Simulations

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Abstract: Concerns around the currency of education have grown as we move further into the Information Age. To address these, Howard Gardner (2006) has proposed 'Five Minds for the Future'. The affective dimension of these proposals is examined; in particular the 'Respectful Mind'. A conceptual model for affective development is examined and applied to the use of games and simulations. Foreign language massively multiplayer games are identified as a possible method to develop the respectful mind with these games acting as 'communities of cultural practice' which can enable the understanding that can lead to empathy. Factors which might hinder the cultivation of respectful ideals are examined with suggestions of further research through native player groups acting as 'host family' to the visiting player to provide cultural and linguistic support.

Keywords: Massively multiplayer, MMORPG, respect, respectful, affective domain, games

Digital Dialogue in the Game of Collaborative Knowledge Building: A Democratic Endeavour on the Intercultural Arena

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Abstract: This study addresses the potential of e-learning and educational technology for promoting intercultural education and an ethos of active democratic citizenship. While identifying the pedagogic approach and the construction of learning architectures as the core challenges in meeting the global need of digital literacy, it investigates the metaphor of drama and play as an optic for designing appropriate pedagogic e-learning architectures and cultivating for fruitful instructional learning processes. Through a design perspective inspired and formed by the metaphors of drama and play, the paper suggests, investigates and discusses, theoretically, and with reference to practice, the characteristics of a specific pedagogical e-learning architecture as a useful model for design. It explores and assesses the extend to which using a design model for intercultural e-learning, developed from the concept of drama and play, may support learner empowerment through furthering intercultural learning processes and digital literacy, as well as promoting ethical awareness of democratic dialogic values and an attitude in learners as active global democratic citizens.

Keywords: Empowerment, global democratic dialogue, intercultural, citizenship, collaborative e-learning, drama

Learning Behavior in Games for Learning

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Abstract: This paper deals with the analysis of learning behavior and play styles in games for learning. In authentic and complex game-based learning environments, also known as open-ended games, everyone has methods and preferences of their own for solving problems. It is important to know how learners approach problems and how their learning progresses in order to support them well and to provide an individual and effective learning experience for every learner. This paper describes how individual learning behavior is analyzed and what consequences such analyses have on the design of innovative games for learning purposes.

In the analysis of learning behavior, the focus lies on cognitive styles which describe behaviors in problem-solving and decision-making environments. There is a special style that has only recently been investigated in classroom environments or in online learning courses with multiple choice questions, namely the impulsive and the reflective style (I/R). Impulsive people tend to react much faster than reflective ones but make more mistakes in their choices. In classic learning environments, impulsive learners are trained to re-think and change their behavior into a more reflective approach since the impulsive behavior is considered a weak behavior. However, in game-based learning environments, impulsive behavior is supported by letting learners try out several possibilities without severe consequences if mistakes are made.

This approach is applied in the strategy and simulation game "Hortus". It is a new game, specifically developed for the analysis of impulsive and reflective behavior. The game is played online and is strongly related to games like Sim City or Civilization that are very popular as classroom games. Its main distinction from those games is that it is somewhat simplified in order to properly analyze learning behavior. The commercial games are yet too complex for testing our approach. The analysis is conducted with a mixed method. The majority of user data is collected implicitly through the online game. The results are to provide quantitative information regarding learning behavior. Qualitative methods are to reveal user information that cannot be collected implicitly. This qualitative method is based on think-aloud protocols.

First results of informal tests indicate two very distinct play styles that affect learning in the game. Further tests are to reveal if these styles correlate with impulsive and reflective learning behavior. There are those players whose main priority is to reach the goal as fast as possible. Dealing with resources in the game is of minor importance to them, while other players are more cautious and try things out before making further choices. Depending on the respective play style, individual learning progress is led in a totally different direction than that intended by the designers. Therefore, it is crucial to know how people might play the game and be aware of different behaviors. According to the results of this research, a new kind of game for learning is planned that adjusts specific elements in the game system in order to lead to the intended learning goals.

Keywords: Game-based learning, learning styles, play styles, impulsive, reflective, learner modelling

The Effect of User Experience Measurement on Entrepreneurship Business Venture Simulation Game Design

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Abstract: There are a lot of simulation games in the market help the learners in identifying users' weaknesses and strengths as well as realizing the skills on running a real business in virtual environment. However, the rapid growth of new simulation game technologies, the business environments and the changes in the profile and demographics of learners have fostered a new group of users looking for new challenges and a stronger involvement in the virtual business venture experience.

This paper aims to study on the need to build a user centered learning practice in simulation game design to the adult learners for business venture. We find that user experience measurement would be the core to build a successful simulation game from the responses and feedback of the users. One area we need to focus more is how to build up an effective channel between the users and game designers. Through the simulation game of business venture from Harvard Business School for learners in experiencing how to do the business with making the appropriate business judgments, a group of adult learners in using this simulation game as part of the Entrepreneurship program training, they are required to go through this simulation game by their own selves to meet the instructor's requirement of achieving a profitable and sustainable business in their game exploration. Also, they need to make the recommendations to us how to improve this game from the user's perspective.

Based on the their recommendations, we examine the game design theory, the contents and the elements of game based learning, issues in relation to user interface and usability in game based learning design. In conclusion, in the area of game based learning for adult learners, the users, education professions and game designers need to work together closely to explore and develop the best simulation game practices for adult learners.

Keywords: User-centered, learning game design, user experience measurement, simulation game, game design theory

Supply-Side Competition Included

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Abstract: This paper describes PARTNER-COMPETITOR, a new business simulation for four teams of at least five players each that emphasizes forecasting, supply chain management and business-to-business negotiations in a simplified competitive environment. Although the marketplace uses only two variables, price and promotional budget, to determine firm-level demand, forecasting this demand is complicated by the competitive nature of this simulation. Although supply chain management is simplified by the fact that only four components, manufactured independently, are needed to produce the final product, the production scheduling is not automated to allow the teams to make critical mistakes. Negotiation occurs because each firm has a competitive advantage in only one of the four components needed to manufacture the final product. Even though all firms have the ability to manufacture all four components, they can lower their costs by purchasing some of the components from their competitors. Hence the question for the title – the teams must manage their firms in an environment where there exists substantial supply-side competition as well as the normally expected demand-side competition. Thus, your opponents in this simulation are your partners as well as your competitors.

Negotiation is frequently the key in business-to-business sales. The negotiation results from the fact that each of the two parties involved believe that they can use give-and-take to get a better deal than that his opponent will volunteer to offer. Although many negotiators view this as a win-lose situation, it is not uncommon for suboptimal compromises to occur. Essential skills include accurate insight into the other party's interests, establishment of a common ground, and tension reduction. Furthermore, most learning about the potential for join. In this game, each team may negotiate with every other team for component parts of their final product. As each team produces every part, but at differing cost efficiencies, therefore there is a beneficial common ground available for each pair of teams.

Four manufacturers produce front-end loaders. These front-end loaders are composed of four major components: the engine, the transmission/drive train, the hydraulic system and the electronics control systems. While each manufacturer has the ability to produce all four components as well as assembling the front-end loader, efficiency varies between firm with each component.

Each team consists of a CEO, a parts coordinator, and at least three negotiators, but this number may be increased. As the computer-assisted processing system records completed contracts by both the teams involved and the part involved, the configuration of the negotiating groups can be left to the instructor's discretion.

An Architectural Model for the Design of Game-Based Learning Activities for Virtual Patients in Second Life

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Abstract: Opportunities for building learning activities around real patients have decreased. Therefore, various forms of representative simulation have become an increasingly common alternative. The use of virtual patients is one such simulation developed to support the delivery of clinical teaching. Virtual patient scenarios offer opportunities for 'game-informed learning'. This is due to their experiential and problem-based learning approaches as prime pedagogic drivers.

A region has been developed in Second Life that aims to deliver game-based learning activities for delivery of virtual patients that can drive experiential, diagnostic, and role-play learning activities concerning diagnoses, and selection of, investigations and treatment. The game-based learning activities for virtual patients were designed based on the four-dimensional framework developed by De Freitas and Martin, as well as other design considerations that look at emergent narratives and modes of representation.

This paper will present the three-component architecture for the delivery of Virtual Patients following game-based learning activities in a multi-user virtual environment (MUVE), such as Second Life. The proposed architecture consists of different virtual patient components that provides the personal and clinical data relevant to the clinical scenario, a data availability model that enables the sequencing and progressive disclosure of a virtual patient identifying triggers and scaffolding information, and an activity model which encodes the activities available and how the learner will be able to engage with the virtual patient. It is anticipated that this three-component architecture will accommodate many different deployment and delivery options for virtual patients in a MUVE.

An overview of recent trials is also provided. The trials aim to explore the experience of computer and videogame play among medical students, and to identify any gender-related differences and social propensities that might exist between high gamers (frequently play computer games) and low gamers (rarely play computer games) in their approaches to game-based learning in Second Life.

Keywords: Game-based learning, Second Life, multi-user virtual environments, MUVE, virtual patients

The Tooth Morphology Board Game: An Innovative Strategy in Tutoring Dental Technology Learners in Combating Rote Learning

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Abstract: The difficulty of learning voluminous content in Tooth Morphology – Module 3 has proven to be extremely challenging for learners, particularly for those who are inadequately prepared, as it involves very high cognitive and abstract theoretical content. This is further compounded by the learner's anxiety toward the voluminous material. Subsequently this encourages rote learning and is often approached with much negativity as learners are unable to conceptualise their learning material. In an attempt to minimise learners' difficulty with this module critically required innovative ways of learning. One such intervention, namely the Tooth Morphology Board Game (TMBG) was developed for first year learners studying towards a diploma in Dental Technology.

The TMBG was designed to promote literacy and improve the learner's ability to retain with understanding the content area of Tooth Morphology. Tooth Morphology is a discipline, which requires a significant amount of memorization, recall, association and application. The chief element of the TMBG is that the abstract content is merged with game characteristics and learners are able to repeat cycles within the game context, making them active participants in knowledge acquisition.

Whilst educational gaming is gaining popularity in medical education, very little has been explored in dental education. The aim of this study is to introduce the TMBG in learning Tooth Morphology- Module 3 to improve learning voluminous content by learners' active engagement in tutorials.

Data from the past two years of tutoring first year Dental Technology learners were used as a diagnostic tool to determine whether 1. the game assists learners in acquiring the literacy practice in their discipline 2. learners' performance in tests improved and 3. generic skills were fostered from playing the game. Module 3 test scores were further used to determine whether incorporating the TMBG improved learning.

Data gathered by means of direct observations, questionnaire surveys and test scores were statistically analysed using SPSS version 15[®]and Nvivo (QSR, Australia) and showed that the TMBG impacted positively on learners' attitudes towards Tooth Morphology and served as part of an overall strategy to reinforce information presented in lectures. This report may be of value to dental educators who wish to offer a creative and interactive alternative to traditional tutoring or classroom activities so as to improve not only the recall of abstract knowledge, but also to provide a learning environment that fosters the acquisition of different skills whilst improving general skills.

Keywords: Dental technology education; knowledge acquisition; active engagement; skill acquisition; motivation

Self City: Training Social Skills in a Game

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Abstract: Self City is a (serious) game to train social skills, developed for adolescents who are socially and emotionally impaired as the result of ADHD, PDD, NOS or neglect. The expectation that a simulation game like Self City contributes to the players' social values in reality is supported by various publications, which argue that these games help develop skills such as process-oriented thinking and conflict resolution outside the 'magic circle' of the game. In addition, research shows that young people with concentration difficulties can focus on games for long periods of time.

A test environment is developed with teachers and pupils within Second Life Teen (no adults allowed). Second Life offers certain possibilities to quickly simulate the game play: the creation of one's avatar, a specific, controlled environment, the programming of specific actions and to log the user behaviour/communication.

In the game, teens can walk around online in the virtual city 'Self City'. The goal is to go the cinema. On the way, the teens find themselves in challenging social situations and learn to deal with them. The teens play the game using an avatar, and are accompanied by a daemon - an alter ego - that advises them in conflict situations. If the teen gets angry, the daemon suggests alternative actions.

The target group displays stereotypical behaviour and finds it difficult to assume different roles and often encounter conflicts in socially complex situations. A problem with social skills training is that these are taught in a group. Few gain from this since their problem is functioning in groups. In a computer game, teens can form a virtual group without experiencing it as a 'real' group. The psychological theory of the Dialogical Self, which focuses on the ability to incorporate different behavioural strategies, is used to define the functional model of the game.

Six test sessions were held to determine whether the mediated form of interaction is more effective than real-life role-play. Teachers and developers controlled the virtual people with whom the pupils interacted on the street. The experience acquired during the development of Self City and in observing the pupils playing result in the following findings:
- The pupils are able to handle the game. They quickly get the hang of navigating and talking, and identify with the environment enough to be able to relate to it;
- The pupils do not immediately see the avatar as an extension of themselves, but in a number of cases, the game succeeds at persuading the pupils to demonstrate their usual behaviour and to correct it;
- The pupils recognize the daemon as a 'buddy', but it must be assigned a very active role in order to be truly effective.

In developing the game further, storytelling sessions are organized with pupils and drama teachers to assess which (social) situations are difficult for the pupils and what sort of behaviour, language and strategies need to part of the game for it to be challenging and fun.

Keywords: Serious games, role-playing, game based learning

Meaningful Double-Loop Learning in Educational Games

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Abstract: Educational games, like games in general, are based on predefined frameworks of rules. Because the players learn by optimizing their behaviour within these frameworks, such games tend to produce single-loop learning. To facilitate also double-loop learning, an educational game must motivate and enable the players to scrutinize and adjust the variables governing their playing behaviour. But since these governing variables are rooted in the game's framework, the players must be allowed to question and alter the framework while playing.

Most educational games are not made for this kind of double-loop learning. Moreover, first-loop and second-loop learning do not seem to mix well in educational games. Games intended to produce meaningful single-loop learning are less or not capable of responding to their players' double-loop learning, and games made to provoke second-loop learning tend to involve 'worthless' first-loop learning.

This conceptual paper suggests that meaningful learning in both loops can be achieved by integrating development sessions in educational games during which the players examine and discuss the objectives, rules and procedures underlying their own playing and, if necessary and technically feasible, adjust them before returning to game playing.

The educational benefits of combining game playing and development in this way may consist in a deeper and more holistic understanding by the players; in the possibility for the players to experiment with, and to experience, different levels of game complexity and alternative sets of rules; in the breaking of immersive playing; and above all in the players' much greater control over the pursuit of their own learning priorities.

Using the case study of an interactive classroom business game, it is shown how meaningful double-loop learning might be achieved in practice. The Cruise Industry Planning Game has been played for three years with large groups of university students who acted as players and co-developers at the same time.

Keywords: Educational games, experiential learning, double-loop learning, cruise industry

Innovative Induction with Alternate Reality Games

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Abstract: Induction is a key factor in helping students acclimatise to Higher Education and in ensuring retention. However, induction activities – both formal and informal – regularly fail to cater for the needs of the diverse range of students that are now entering Higher Education. Formal induction activities, such as library induction, tend to be short sessions often delivered to large groups run in inflexible face-to-face slots. The perceived usefulness of these sessions is not always apparent to students because they take place at the start of the year and inevitably use tasks that are not contextualised. Socialisation and orientation activities, which are commonly based around pubs, do not always suit students from different backgrounds and cultures.

This paper describes the Alternate Reality Games for Orientation, Socialisation and Induction (ARGOSI) project, which aims to use an alternate reality game to provide an engaging and purposive learning environment in which students can meet others, explore the city of Manchester and learn basic information seeking and evaluation skills. An alternate reality game (ARG) consists of a series of challenges, which take place both online and offline, individually and in groups. These challenges are underpinned by an ongoing narrative structure and online community. Alternative reality games offer an inclusive, cost-effective and engaging alternative to traditional induction activities, where learning activities are embedded within the story as it unfolds and skills and information are learned in a meaningful context.

The structure and pedagogic advantages of alternate reality games will be discussed and the paper will demonstrate how they can be used to meet specified learning outcomes. A case study example of the ARG developed will be described and the student-centred design process and evaluation of the project will also be briefly discussed. Finally, the paper will highlight some of the issues to be considered with the use of alternate reality games in Higher Education.

Keywords: Alternate reality games, urban play, induction, information literacy, retention, student experience

MobileMath: The Phone, the Game and the Math

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Abstract: Computer games appear to be able to engage students in meaningful learning, inside as well as outside of school. Mobile games, especially location-based games played on mobile phones with GPS, integrate the player's position into the game-play and thus support situative learning. This type of games can augment the reality by adding 'virtual elements' to it. In this paper we discuss the results of a pilot study on MobileMath, a location-based mobile game that integrates concepts from mathematics and geography.

MobileMath is played on a mobile phone with a GPS receiver. It is designed to investigate how a modern, social type of game can contribute to students engagement in learning mathematics. Teams compete on the playing field by gaining points by covering as much area as possible. They do this by constructing squares, rectangles or parallelograms by physically walking to and clicking on each vertex (point). The shapes they construct are virtual elements added to the real world. As the game proceeds the free playing space gets smaller. It is possible to 'hinder' other teams and to deconstruct the shapes they made, points are gained by this also. During the game, in real-time the locations of all teams and all finished quadrilaterals are visible on each mobile phone. The game data are stored online and can be viewed back and discussed later.

In this pilot study the usability of MobileMath was tested with three different secondary schools. Four one-hour games, each with seven or eight teams of two students (n=60), were played around the schools. Data were gathered by means of (participatory) observation, analysis of the games played, a survey and interviews with students and teachers.

The results show highly motivated students, who enjoyed playing the game. Students indicated they learned to use the GPS, to read a map and how to construct quadrilaterals.

Keywords: Game-based learning, mobile games, GPS, mathematics education

Cognition-based Learning Principles in the Design of Effective Serious Games: How to Engage Learners in Genuine Learning

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Abstract: The use of games in learning and instruction, often referred to as serious games, has been propagated by many researchers. However, the complexity of serious games may cause players to engage in ineffective cognitive processes. We propose three design guidelines: predicting, resolving information gaps and postdicting to enable players to engage in effective cognitive processing, such as inferring. Moreover, we argue that these design guidelines should be designed carefully, that is, they should be in line with the game discourse. Therefore we have developed a method for analyzing the discourse that is used in serious games. In its current form the *Game Discourse Analysis* (GDA) comprises four steps: decomposition in propositions, qualifying the propositions, connecting the propositions and identifying scripts/plans. We assume that players of serious games act in a more or less intentional plan-based way in order to find a solution path through a problem space. The result of the GDA is a description of the different (discourse) elements and the relations that play a role in this process. The designer can use this analysis to determine the appropriate location and time in the narrative to implement a design guideline. Furthermore, the analysis prescribes which domain knowledge and skills are required (either as scripts or plans) to solve the problem in the game. In the last section, we contend that suspense, curiosity and surprise are techniques that take into account the characteristics of the game discourse, such as the narrative. At the same time these techniques trigger effective cognitive processes. We will sketch how the GDA can be used to facilitate the use of the suspense, curiosity and surprise techniques in order to implement the aforementioned design guidelines. We will do this in a game for training medical first responder emergency personnel to perform a triage after an explosion in the subway.

Keywords: Serious games, discourse analysis, cognition, guidelines

Games Atelier: Location-based gaming: The city as your playground

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The developments of location-aware and mobile technology give many exciting opportunities to create new ways of learning, using the treasures of information that the urban environment conceals. With handhelds it is possible to mix virtual data with real-world locations and contexts, and connect them with each other. In these learning situations social interaction always plays a major part; both in gameplay and knowledge transfer. Mobile games in education are excellent ways to combine situated, active and constructive learning with fun. Though both the design and the effects of game-based learning have been studied before, showing that playing and creating games can be highly motivational for students, mobile game-based learning is still under-researched. With the research on Frequency 1550 and Games Atelier as part of an intensive research program on Location-based playful learning in secondary education, we wish to add structural knowledge on the effects on usability, learning and engagement of mobile games.

In 2005, Waag Society developed Frequency 1550 (www.waag.org/frequency): a location-based game in which mediaeval Amsterdam was brought back to life as part of a history curriculum for 12-14 year old children. Teams students - two of them located at headquarters at The Waag in Amsterdam, the other two walking the streets of Amsterdam - step into the game's world. With help of the Internet, smart phones and GPS technology, Amsterdam changes into a medieval playground. Captured by the strong underlying historic narrative the children headed out onto the streets in teams where they had to conquer city zones by performing location-based assignments with their GPS-enabled phones. Answering involved sending in self-made photos and videos. Strategic use of virtual bombs, confrontations and invisibility cloaks added strategic skills to the experience.

In 2007 the game was researched by the Universities of Amsterdam and Utrecht, concluding the motivational and learning effects of this type of education to be considerably stronger in comparison with traditional education. Results of an analysis of the game as a narrative environment showed that Frequency 1550 evokes a mixture of receiving, constructing and participating in the story of medieval Amsterdam. Evaluation of the learning effects reveals that students who played *Frequency 1550* acquired significantly more historical knowledge than the students who attended a regular lesson series. However, one element was underexposed in the design of *Frequency 1550*: the aspect of learner-centred production. Students played a game developed by someone else and could only minimally influence the game play: rules, goals and objectives, identities, story line and assignments were all designed by others. The potential effect of *creating* games was not addressed. It is just this, which is taken one step further in the newly developed Games Atelier.

Games Atelier: players as producers: Games Atelier (www.waag.org/gamesatelier) is a mobile gaming and learning method, that enables students and teachers to create, play and share their own location-based games. In the development of Games Atelier, Waag Society collaborates with five local secondary schools and the Amsterdam city department for social development. In the Games Atelier pilot on citizenship, 20 children between the ages of 12 to 18 went through all stages of creating games, based on themes like cultural

diversity and social behaviour, exploring how people are involved with and relate to their city and its residents. The pilot was launched by the major of Amsterdam on March 14th 2008.

The research questions underlying the project are: How can location-based gaming be used to create authentic learning experiences?
How can urban reality function as a social/economic/geographic/cultural-learning environment?
How do mobile media, narratives and collaborative game-play influence motivation and knowledge transfer in mixed-reality situations?
How can location-based experiences help to make children into active and aware producers and which tools do they need to express themselves?

Technology: Games Atelier is supported by a mobile and web-based toolset and technology platform tailored to location-based projects called 7Scenes (www.7scenes.com). Based on different game templates with specific game rules, they can add photo's, video's, audio, notes and tasks to locations (on a map) with which they can create narratives. The students can subsequently create a competition by setting up teams and publish their games. Using a mobile application and GPS, players navigate the city, discover the storyline, collaborate with other players, perform tasks, record and upload media and score points. The entire game is broadcasted live on the web and archived so players (and teachers) can play back all interaction and reflect on the process: the locations they encountered, the interaction with other players and the media that was created.

Game templates and gameplay: To provide a useable structure for students of different education level, Games Atelier offers three different templates with different degrees of complexity.The Secret Trail includes a discovery route visiting various spots in the environment via hints and assignments that pop-up on the mobile phone. Solving the assignment on a certain location provides the next hidden location. The aim of the game is straightforward: the winner is the one who collects most points in the shortest time period. In the Collect & Trade template players have a mission to collect a specific combination of objects. Objects are hidden on locations and can be earned by completing assignments. In order to get the right combination of objects, players can trade their objects with other players on the streets.

The Adventure template is set up as a Role Playing Game. At the start of the game, all teams have certain identity characteristics, which determine their power and skills in the game. Various assignments for different identities are placed on location. Identities can enhance their power and skills by performing assignments, collecting objects and winning confrontations with other players. Students can choose to include web-players in the game design, which involves communication between teams in the urban space and remote online players, so they are enabled to work on location-based assignments collaboratively. Each game created by students can be previewed online with the teacher before it will be tested with other students and played by the audience. In 2009, Games Atelier will be implemented as a validated learning method for schools for secondary education in the Netherlands. Kick off is a national mobile game contest. The Universities of Amsterdam and Utrecht are again involved in academic research on effects on usability, learning and engagement.

Keywords: Mobile gaming, location-based technology, situation-based learning, players as producers, game-based learning