

GATE – Project description W.P. 4.2

Dr. J. Raessens

1. Project title

Design rules for learning through simulated worlds.

2. Project leader

Dr. J. Raessens, Associate Professor of New Media and Digital Culture, Department of Media and Culture Studies, Faculty of Humanities, Utrecht University.

3. Project participants

Prof. dr. W. Uricchio, Professor of Comparative Media History, Department of Media and Culture Studies, Faculty of Humanities, Utrecht University and Professor and Director of the Comparative Media Studies Program at MIT.

Prof. dr. P. A. Kirschner, Professor of Educational Psychology and ICT, Research Centre Learning in Interaction, Faculty of Social and Behavioral Sciences, Utrecht University.

Prof. dr. P. R. J. Simons, Professor of ICT and Learning, Dean of the IVLOS Institute of Education, Utrecht University.

Dr. C. Kattenbelt, Associate Professor of Media Comparison and Intermediality, Department of Media and Culture Studies, Faculty of Humanities, Utrecht University.

Dr. J. Raessens, Associate Professor of New Media and Digital Culture, Department of Media and Culture Studies, Faculty of Humanities, Utrecht University.

Dr. M. Copier, Assistant Professor, Department of Media and Culture Studies, Faculty of Humanities, Utrecht University.

Drs. T. Dubbelman, PhD-student, Department of Media and Culture Studies, Faculty of Humanities, Utrecht University.

Drs. S. Deterding, PhD-student, Department of Media and Culture Studies, Faculty of Humanities, Utrecht University.

4. Amount of funding from GATE

500 k.

5. Abstract for laymen (in Dutch)

Dit interdisciplinaire programma onderzoekt hoe media- en gametheorie ingezet kunnen worden om het ontwerp en daardoor de leerresultaten van educatieve entertainment en serious games te verbeteren. Daarvoor maken onderzoekers vanuit verschillende disciplines zoals media-, cultuur- en onderwijswetenschappen gebruik van bestaande theorieën over serious games en gaming volgens welke games niet alleen ontworpen en gespeeld worden om te entertainen maar ook om te leren, te trainen en te informeren. Deze theorieën worden verder ontwikkeld en kritisch geëvalueerd in een drietal deelprojecten: 1. De studie van verhalen vertellen: Hoe narratieve structuren ontworpen kunnen worden om leerprocessen te verbeteren, 2. De studie van persuasieve retorica: Hoe bepaalde retorische strategieën ontworpen kunnen worden om spelers beter te overtuigen van bepaalde standpunten (e.g., politieke games), of van de noodzaak van gedragsverandering (e.g., gezondheidsgames), en 3. De studie van multiplayer online werelden en games: Hoe ontwerpprincipes die ten grondslag liggen aan multiplayer online werelden en games gebruikt kunnen worden om leerprocessen te verbeteren (i.e., effectiever, efficiënter en/of bevredigender te maken). Elk

deelproject onderzoekt op welke wijze relevante media- en gametheorieën aangepast kunnen worden om op productieve wijze gebruikt te kunnen worden voor het ontwerpen van educatieve computergames. De projectleider zal een synthetische monografie schrijven waarin de resultaten van de drie deelstudies vergeleken, geïntegreerd en gesitueerd worden binnen een bredere cultuurhistorische context.

6. Abstract for laymen (in English)

This interdisciplinary research program aims to investigate how media and game theory can be called upon to improve the design and thereby the learning results of educational entertainment and serious games. For that purpose, researchers from different disciplines such as media and culture studies and educational sciences will call upon theories of serious games and gaming in which games are not only designed and played to entertain, but also to educate, train, and inform. These theories will be further developed and critically evaluated in three sub-projects: 1. The study of storytelling: How narrative structures can be designed to improve learning processes, 2. The study of persuasive rhetoric: How certain rhetorical strategies can be designed to convince players of certain points of view (e.g., political games), or behavioural changes (e.g., health games), and 3. The study of multiplayer online worlds and games: How design principles underlying multiplayer online worlds and games can be used to improve learning processes (i.e., make them more effective, more efficient and/or more pleasurable). Each sub-project examines the ways in which the relevant media and game theoretical frameworks can be adapted in order to be used productively for the design of educational computer games. The project leader will write a synthetic monograph in which the results of the three areas are compared, integrated and situated in a broader cultural-historical context.

7. Problem statement

In the last decade, computer games have become a form of mass entertainment, not only for youngsters, but also for elderly people (ESA, 2006). Although widely publicized reports associating games with violence and addictive behaviours initially cast more nuanced research into the shadows, things have begun to change. Among other things, recent research has shown that computer games can motivate players to learn, engaging them in the learning processes; they can enable players to acquire and improve domain specific knowledge; acquire and sharpen cognitive skills such as spatial abilities, media literacy, decision making and problem solving; and stimulate so-called metacognitive learning-to-learn competences that promote the potential for further, life-long learning. Nevertheless, evidence for these claims is controversial, and academics do not always agree on the criteria and methods that can or should be used to effectively measure the presumed learning effects.

In the field of education, game-based learning is said to appeal to the informal learning skills that pupils and students playfully acquire using digital technologies outside school (De Haan & Van 't Hof, 2006). Playing educational games would prepare pupils and students for a world that will increasingly focus on innovation and change. To deal with the economic and political consequences of the process of globalization, in particular the rise of countries such as China and India (Friedman, 2005), schools and universities are called upon to teach their students how to be creative instead of teaching them – as was often the case – standardized competencies (Shaffer & Gee, 2006). We can also detect this interest in games (i.e., serious games – computer games that educate, train and inform, Michael & Chen, 2006) outside the field of education, for example in commercial (educational publishers) and non-commercial enterprises (United Nations, Unicef, medical centers). Because serious games seem to affect our intellectual, volitional and affective experiences, it is not surprising that these organizations and companies are seeking collaboration with game designers and

developers to implement existing games, modify them or develop completely new games that fit into their company strategy.

Research in the field of serious games is rapidly growing. Existing game studies tend to focus on the collection of pragmatic game-design rules (Barwood & Falstein, 2006), on the establishment of a general theoretical framework for the emerging field of game design (Salen & Zimmerman, 2004, 2006) and on the learning principles built into successful educational games (Gee, 2003, 2004, 2005), while arguing why and how games can help the learning abilities of children (Prensky, 2001, 2006; Shaffer, 2006; Jenkins, 2006; Squire, in press). This research project examines a number of conceptual, media-theoretical and qualitative and quantitative empirical issues that have not always systematically been dealt with in existing game studies, though they determine the design and analysis of much-discussed educational games, such as: What role does narrative play in learning and particularly in educational games (such as *Frequency 1550*)? How do persuasive strategies work in games for change such as *Food Force* and *Darfur is Dying*, and in health games such as *Re-Mission*? What are the game specific characteristics that would make multiplayer online worlds (such as *Second Life*) and games (such as *World of Warcraft*) apt for education? What are the presumed educational benefits of these serious games? How can we go beyond existing anecdotal evidence and develop medium-specific criteria to help us understand how these games and their users interact (Salomon, 1994)? How can we use learning theories to better understand educational games (Kafai, 1995; Kafai & Resnick, 1996; Boekaerts & Simons, 2003; Kirschner, 2006)? In answering these and other exploratory questions, we will contribute to the ongoing development of media-theoretical frameworks that might help game designers and game developers to improve and discuss the design and learning effects of educational games.

8. Description of the proposed research

This program consists of two PhD-projects (carried out by drs. T. Dubbelman and drs. S. Deterding), one post-doc project (carried out by dr. M. Copier) and one synthetic study (carried out by dr. J. Raessens).

- PhD Project 1: Game design as narrative architecture (Drs. T. Dubbelman)
- PhD Project 2: Persuasive rhetoric in game design (Drs. S. Deterding)
- Post-doc Project 3: Design of multiplayer online worlds (Dr. M. Copier)
- Project 4: Serious game design (Dr. J. Raessens)

PhD Project 1: Game design as narrative architecture

This project assesses various theories of how the medium-specific characteristics of computer games make it possible to tell stories, and how the design of these narrative possibilities can improve the motivation for and learning effects of playing educational computer games.

Within game studies, the relationship between games and narratives remains a much-discussed theoretical problem. In the so-called ludology versus narratology debate (Murray, 2005; Aarseth & Jenkins, 2005), ludologists are supposed to focus mainly on game play from the point of view of game mechanics (Juul, 2005a, 2005b) while narratologists would approach games primarily in the context of storytelling (Ryan, 2006; Murray, 1997). This project critically elaborates on narrative theories as developed within literary and media studies (Chatman, 1978; Genette, 1980; Bordwell, 1985; Branigan, 1992; Montfort, 2003) to clarify the differences and similarities between games and (interactive) narratives. It takes as its starting point Frasca's critique of the ludology – narratology debate (Frasca, 2003) and Jenkins' ideas of spatial stories and environmental storytelling as a middle-ground position between ludologists and narratologists (Jenkins, 2004).

Tentative results from research areas such as media psychology and communication studies (Vorderer & Bryant, 2006), educational science (Hug, 2005; Simons, 1981) and media studies (Raessens, 2007) show that the motivation for and effectiveness of learning processes could be improved through the combination of game elements and processes of ‘storification.’ This project critically evaluates the use of stories as an educational tool and seeks to contribute to the discussion how computer games, as sites of interactive narrative, can be designed to function effectively as narrative learning environments.

This project will combine different research methods. Its conceptual and media-theoretical framework is formed by the above-mentioned theories of games, narratives and their relationships. We will study how narrative frameworks in general structure learning contents, explore the challenges posed by interactive narratives, and we will devise a comparative textual analysis of a small corpus of successful educational games. We will also implement some of our conclusions into a newly designed game. Because learning, like games, is situated, the evaluation process will be designed to address various learning scenarios. Such different strategies as the challenging of assumptions, stimulating collaboration, or generating novel solutions for open-ended problems, require creative assessment if we are to understand their implications for learning. The project will draw on best practices, while at the same time critically assessing these practices and pushing for the development of new evaluation frameworks.

PhD Project 2: Persuasive rhetoric in game design

This project investigates how the medium-specificity of computer games make them suitable for persuasive purposes and to what extent and in what ways persuasive strategies can be designed to convince serious-game players of the veracity of a certain point of view – as in games for change – or the necessity of a behavioral change – as in health games.

Within this project, the study of the art and practice of persuasion through computer games in general and serious games in particular, critically elaborates on Sutton-Smith’s (1997) rhetoric-of-play theory which holds that the design of formal and experiential structures of games and play (i.e., their rules, forms of participation and uses of play) embody, justify, contradict or transform dominant ideological values and beliefs. Because games put culture “at play,” we also study them as social contexts for cultural learning. In doing so, we use notions of rhetoric, persuasive strategies, metaphor and framing as developed within sociology, cognitive linguistics, communication and media studies (Goffman, 1974; Lakoff & Johnson, 1980; Lakoff, 2004; Hoeken, 1998; Bordwell, 1989; Mahal, 1982).

A detailed analysis of the functioning of political rhetoric and ideological frames in computer games (Bogost, 2006, 2007) and the outcome of the study on the game *Re-Mission* that aspires to improve the health and quality of life of young people with cancer (HopeLab, 2006), suggests that changes in attitudes and behavior can be reinforced through well-designed political and medical games. This project studies rhetoric in general and analyzes how rhetoric can cause or trigger change. It critically evaluates the use of rhetoric in games for change (such as *Darfur is Dying* and *Food Force*) or health games (such as *Re-Mission*) and wants to contribute to the discussion on how computer games can be designed to effectively function as rhetorical tools.

This project will combine different research methods. The conceptual and media-theoretical framework of play rhetoric will be complemented with the above-mentioned theories of persuasive texts. We will study how rhetoric in general affects change and how certain television and radio programs as well as educational films make use of persuasive rhetoric to achieve behavioral or attitudinal change. We offer a comparative textual analysis of a small corpus of successful games for change and/or health games. We will also

implement some of our conclusions into a new designed game. To measure the assumed persuasive effects, we will draw on a range of qualitative and quantitative testing protocols, paying careful attention to the comparative explanatory power of the various assessment regimes.

Post-doc Project 3: Design of multiplayer online worlds

This project investigates how the medium-specific characteristics of multiplayer online worlds and games make them suitable for educational purposes, and how their design and play can teach us lessons about the development of networked and collaborative learning and teaching environments.

Multiplayer online worlds (such as *Second Life*) and games (such as *World of Warcraft*) offer tools for the participatory design of (social) rules and content, such as characters and virtual communities, and encourage game-modifications, in-game businesses and collaborative storytelling (Taylor, 2006; Castronova, 2005; Copier, 2007). They seem to reinforce the promise that social-constructivist educational models aim for. This case study focuses on the interaction between participatory design and actual play/behavior in and around online worlds and games and aims to answer the question how this knowledge can be used in facilitating networked and collaborative learning and teaching.

Research done on the features of multiplayer online worlds (Herz, 2005) and games (Steinkuehler, 2005) shows their importance for learning practices, because they are sites for identity formation, meaning-making as well as complex problem solving. This project focuses on *Rules of play: virtual worlds*, a MA-course within the New Media and Digital Culture-program at Utrecht University. Students are both participants in this study as well as actively involved in generating knowledge about *Second Life* and *World of Warcraft*. Both past and future versions of the course will be reviewed from a student and teacher perspective through auto-ethnography and interviews.

This project will combine different research methods. The conceptual and media-theoretical study of participatory design tools of online worlds and games, and networked and collaborative learning will be combined with an ethnographical study (self-play and interviews) of the interaction between participatory design and actual play and behavior of *Second Life* and *World of Warcraft*. Important in this regard is the study of the correspondences and differences between online worlds and games. We will do field experiments on the use of participatory design tools in networked and collaborative learning in academic education.

Project 4: Serious game design

The aim of this project is to develop an empirically and conceptually based media-theoretical framework for the analysis and interpretation of various serious gaming practices. To realize this ambition, the research projects 1, 2 and 3 will be compared, integrated into a general theory of serious games and gaming, and situated in a broader cultural context.

Comparative analysis: We will systematically investigate how narrative-based, persuasive rhetoric-based and collaborative network-based learning processes are interrelated within the domain of serious games. The similarities and distinguishing characteristics of serious and entertainment games and simulations, and different platforms (console, PC, online) will also be taken into account. The spectacular growth of serious games is related to a remarkable ‘ludification’ of cultural domains (Raessens, 2006a). We will, therefore, focus on a variety of user practices, such as education, politics (Raessens, in press), health care, business, documentary (Raessens, 2006b), art, policy making, and warfare.

Theory construction: The comparative analysis will be further developed into a general theory of serious games and gaming in accordance with the outlines sketched in the

general part of section 7. The central questions are: What are serious games and how can they be classified? How can play include seriousness? What is the historical origin and social function of serious games? Relevant parts of play (Caillois, 2001; Huizinga, 1955) and game studies (Aarseth, 1997; Jenkins, 2004; Juul, 2005a, 2005b; Ryan, 2006) will be reconstructed, critically analyzed and further developed in order to use them as analytical and genealogical tools in the analysis and interpretation of serious games and gaming.

Cultural context: We believe that game studies have a normative and political dimension as well. Here the central questions are: Do serious games lead to superficiality and trivialization, or are they adequate strategies for dealing with serious issues? Are serious games a manifestation of participatory media culture (Raessens, 2005)? Who profits from them: economically and politically driven companies or players? What kind of serious games should we develop, and for what reasons? To answer these questions, we will study the interaction of gaming technologies, culture and marketing (Kline, Dyer-Witthof & De Peuter, 2003).

9. Description of the proposed work plan

The research program runs from September 2006 to April 2012. The two PhD-projects run from March 2008 to March 2012, the post-doc project from September 2007 to September 2010, and the synthetic project from September 2006 to April 2012.

Work program PhD project 1: Game design as narrative architecture

The research project is carried out over a period of four years, according to the following phases:

1. March 2008 – December 2008:

Conceptual and media-theoretical analysis of the ludology – narratology debate with a focus on the role, function and success of storytelling for achieving learning results:

- Literature study: Narrative theories (Bordwell, Branigan, Chatman, Genette, Montfort), theories of play (Huizinga, Caillois) and games (Aarseth, Frasca, Jenkins, Juul, Murray, Ryan, Salen – Zimmerman).
- Identification of case studies, comparative textual analysis of a small corpus of successful games (corpus to be selected in agreement with researcher).
- Writing draft chapter one (article 1).
- Presenting a paper at an international conference (e.g., ICLS, GLS).
- Presenting a paper at a national conference (e.g., Onderwijsresearchdagen).

2. January 2009 – October 2009:

Investigation of learning theories with a focus on the impact of storytelling on learning:

- Literature study: Gee, Shaffer, Squire, Jenkins, Prensky, Kafai, Resnick, Boekaerts, Simons, Kirschner.
- Research: description, analysis and interpretation of some storytelling practices; assessment of existing testing protocols, identification of areas for continued development of assessment methods.
- Writing draft chapter 2 (article 2).
- Presenting a paper at an international conference.
- Presenting a paper at a national conference (e.g., DiGRA-NL).

3. November 2009 – April 2010:

- Research: continuation.
- Writing draft chapter 3 (article 3).
- Presenting a paper at an international conference.
- Presenting a paper at a national conference (e.g., Onderwijsresearchdagen).

4. May 2010 – July 2010:

- Writing a state-of-the-art article in an international journal or book about the medium-specificity and user practices of computer games with regard to storytelling and learning (article 4).

5. August 2010 – October 2010:

- Writing draft of conclusion.

6. November 2010 – April 2011:

- Presenting a paper at an international conference.
- Presenting a paper at a national conference (e.g., Onderwijsresearchdagen).

Additional research:

- Gaps in the investigation.
- Recent developments.

7. May 2011 – February 2012:

Writing and completion – approval of thesis.

Work program PhD project 2: Persuasive rhetoric in game design

The research project is carried out over a period of four years, according to the following phases:

1. March 2008 – December 2008:

Conceptual and media-theoretical analysis of the rhetoric of play and games with a focus on the role, function and success of rhetoric for achieving change:

- Literature study: Goffman, Lakoff, Johnson, Sutton-Smith, Bogost, Hoeken; theories of play (Huizinga, Caillois) and theory and design of computer games (Aarseth, Juul, Salen – Zimmerman).
- Identification of case studies, analysis of main examples (corpus to be selected in agreement with researcher).
- Writing draft chapter one (article 1).
- Presenting a paper at an international conference (e.g., ICLS, GLS, G4C).
- Presenting a paper at a national conference (e.g., Onderwijsresearchdagen).

2. January 2009 – October 2009:

Investigation of learning theories with a focus on the impact of rhetoric on learning:

- Literature study: Gee, Shaffer, Squire, Jenkins, Prensky, Kafai, Resnick, Boekaerts, Simons, Kirschner.
- Research: description, analysis and interpretation of rhetorical practices found both in the playing of games and in the use of rhetoric in general; determination of testing frameworks and available qualitative and quantitative instruments.
- Writing draft chapter 2 (article 2).
- Presenting a paper at an international conference.
- Presenting a paper at a national conference (e.g., DiGRA-NL).

3. November 2009 – April 2010:

- Research: continuation.
- Writing draft chapter 3 (article 3).
- Presenting a paper at an international conference.
- Presenting a paper at a national conference (e.g., Onderwijsresearchdagen).

4. May 2010 – July 2010:

- Writing a state-of-the-art article in an international journal or book about the medium-specificity and user practices of computer games with regard to persuasive rhetoric and learning (article 4).

5. August 2010 – October 2010:

- Writing draft of conclusion.

6. November 2010 – April 2011:

- Presenting a paper at an international conference (e.g., ICLS 2010).
- Presenting a paper at a national conference (e.g., Onderwijsresearchdagen).

Additional research:

- Gaps in the investigation.
- Recent developments.

7. May 2011 – February 2012:

Writing and completion – approval of thesis.

Work program Post-doc project 3: Design of multiplayer online worlds

The research project is carried out over a period of three years, according to the following phases:

1. September 2007 – August 2008:

- Conceptual and media-theoretical analysis of online worlds and games.
- Research: ethnographical study (self-play and interviews); field experiments.
- Writing a state-of-the-art article in an international journal or book about the medium-specificity and user practices of multiplayer online worlds and games.
- Presenting a paper at an international conference.

2. September 2008 – August 2009:

- Critical elaboration of theories on networked and collaborative learning and teaching.
- Research: continuation.
- Writing a state-of-the-art article in an international journal or book about the ways in which multiplayer online worlds and games can be used for facilitating networked and collaborative learning and teaching.
- Presenting one paper at an international conference.

3. September 2009 – August 2010:

- Research: continuation.
- Writing a state-of-the-art article in an international journal or book based on ethnographical study (self-play and interviews) of the interaction between participatory design and actual play and behavior of *Second Life* and *World of Warcraft*.
- Presenting a paper at an international conference.

Work program Project 4: Serious game design

The research project is carried out over a period of five years, according to the following phases:

1. September 2006 – August 2007:

- Developing a conceptual and media-theoretical framework of serious games and gaming.
- Writing two state-of-the-art articles on the analysis of serious games and gaming in an international journal or book.
- Presenting a paper at an international conference.

2. September 2007 – August 2008:

- Developing a conceptual and media-theoretical framework of serious games and gaming: continuation.
- Writing two state-of-the-art articles on the analysis of serious games and gaming in an international journal or book.

- Presenting a paper at an international conference.
3. September 2008 – August 2009:
- Developing a general theoretical framework of serious games and gaming with a focus on learning.
 - Writing two state-of-the-art articles on serious games, gaming and learning in an international journal or book.
 - Presenting a paper at an international conference.
 - Completion of the monograph *Serious Games and Gaming: A Media-Theoretical Approach*
4. September 2009 – August 2010:
- Developing a general theoretical framework of serious games and gaming with a focus on learning: continuation.
 - Writing two state-of-the-art articles on serious games, gaming and learning in an international journal or book.
 - Presenting a paper at an international conference.
 - Comparative analysis projects 1, 2 and 3
5. September 2010 – March 2012:
- Completion of synthetic study and monograph *Serious Games, Gaming and Learning*.
 - Presenting a paper at an international conference.

10. National and international collaboration

Researchers of the projects and the supervisors will meet every month to discuss the progress of the research project. We will meet on a regular basis with the researchers of the other work packages within GATE, especially within theme 4 (Learning with simulated worlds), but also within the other themes.

The project participants collaborate in various international research networks:

- Prof. dr. W. Uricchio is Director of the Comparative Media Studies Program at MIT, and Leading Principal Investigator of The Singapore-MIT GAMBIT Game Lab. He is contributing editor to the *International Journal of Cultural Studies* (SAGE) and a member of the editorial board of *Games and Culture* (SAGE) and the MIT Press.
- Prof. dr. P. A. Kirschner is Chair of the Research Centre Learning in Interaction, Utrecht University. He is also a member of the International Society for the Learning Sciences and its executive committee of the division Computer Supported Collaborative Learning. He is executive chair of the upcoming 8th International Conference in the Learning Sciences to be held in Utrecht in 2008.
- Prof. dr. P. R. J. Simons is Dean of the IVLOS Institute of Education and Director of the Centre for ICT in Education, Utrecht University. He is an active member (and past President) of EARLI, the European Association for Research on Learning and Instruction.
- Dr. C. Kattenbelt is co-convener of the research working group Intermediality in Theatre and Performance under auspices of the International Federation for Theatre Research and co-editor of Theater Topics and E-view, an online journal on theatre, film, television and digital media.
- Dr. J. Raessens was the conference chair of the first Digital Games Research Association-conference Level Up in Utrecht (2003), co-editor of *Level Up. Digital Games Research Conference* (Utrecht University, 2003) and the *Handbook of Computer Game Studies* (MIT Press, 2005). He is a member of the editorial board of *Games and Culture* (SAGE) and co-supervisor of the Playful Identities Research Program (see below).

- Dr. M. Copier was co-organizer of the first DiGRA-conference Level Up in Utrecht (2003), co-editor of *Level Up. Digital Games Research Conference* (Utrecht University, 2003) and DiGRA board member. Currently she is director of the Utrecht School of Art and Technology (USAT) at the Faculty of Art, Media and Technology of the Utrecht School of the Arts. Copier is also member of the editorial board of the *International Journal of Role-Playing*, and member of the review board of *Game Studies*. *The International Journal of Computer Game Research*.

This research program is carried out within the framework of the Utrecht Media Research program led by Prof. dr. F. Kessler. This program is concerned with research into the cultural construction of the media. We will profit from the various national and international research networks that the UMR-members participate in (www.let.uu.nl/umr).

We will also profit from existing national academic collaborations, for instance with Prof. dr. J. Goldstein (Media Psychology, Faculty of Social Sciences, Utrecht University) and the Playful Identities-research group. This group focuses on the impact of digital media (computer games, internet, cell phones) on processes of identity construction. This collaboration between the Faculty of Philosophy (Erasmus University Rotterdam) and the Department of Media and Culture Studies (Utrecht University) consists of Prof. dr. J. de Mul, Prof. dr. V. Frissen, dr. J. Raessens, drs. E. Nieuwdorp, drs. J. Timmermans and drs. M. de Lange (www.playful-identities.nl).

We will intensify existing contacts with international academic partners, such as MIT's Comparative Media Studies Program (CMS). CMS co-sponsors the Education Arcade (www.educationarcade.org); and Prof. dr. W. Uricchio (MIT and Utrecht University) and Prof. dr. H. Jenkins (MIT) are Leading Principal Investigators of the Singapore – MIT GAMBIT Game Lab (gambit.mit.edu). We will also collaborate with the UCLA Graduate School of Education & Information Studies (Dr. Y. Kafai), the University of Wisconsin-Madison School of Education (Dr. D.W. Shaffer), the Arizona State University (Prof. dr. J. P. Gee), the School of Education and Lifelong Learning, University of Exeter (Prof. dr. R. Wegerif and Dr. M. de Laat) and the USC Annenberg School for Communication (Prof. dr. P. Vorderer).

We are closely collaborating with national and international organizations that enable the design and development of and research into learning games, such as the Education Arcade (www.educationarcade.org), the Serious Games Initiative (www.seriousgames.org), Games for Health (www.gamesforhealth.org), Games for Change (www.gamesforchange.org), HopeLab (www.hopelab.org), UNHCR, United Nations, the European Kaleidoscope network, and the Creative Learning Lab of Waag Society (www.waag.org). These collaborations enable us to participate in a growing field called 'educational design research' according to which the design of computer games is (at least partly) influenced by theoretical propositions, and field testing of their design contributes to theory development (Van den Akker, 2006).

11. Expected results: Output, both qualitative and quantitative

Planned deliverables and knowledge dissemination (all in English):

- Two dissertations (projects 1 and 2).
- Nineteen articles in international peer-reviewed journals or books (project 1, 2, 3 and 4).
- Sixteen paper presentations at international conferences (project 1, 2, 3 and 4).
- A number of workshops at international conferences (e.g., ICLS 2008 and 2010) where researchers, supervisors and experts will meet to discuss (provisional) results.
- Eight paper presentations at national conferences (projects 1 and 2).

- Two monographs on serious games and gaming (project 4).
- Contributions to the GATE-website where we present and discuss (provisional) results, with an annotated bibliography, seminar and conference agenda et cetera.
- Participation in a monthly seminar organized by the Multidisciplinary Utrecht Serious game Expertise centre (MUSE).
- The research group will also disseminate the results to a wider audience by means of public lectures, essays in popular journals and magazines, national newspapers et cetera. We will also experiment with some ludic ways of knowledge dissemination.
- Provisional design models for narrative-based, rhetoric-based and multiplayer-based learning games.

12. Potential for knowledge transfer

The results of this research program can be used to identify the design rules that are at the basis of successful learning environments, games and simulations. These insights will help professionals to improve their design and development of entertainment and serious games that can educate, train and inform.

This research program will answer the following questions: How can combinations of learning and entertainment be designed? How to design combinations of simulations, games and learning? How to design simulations and games that are able to persuade users? How can the appeal of online multiplayer worlds and games be used for learning purposes? The answers to these questions will be of assistance to the work of Dutch game designers and developers. Commercial game companies can strengthen their competitiveness and non-profit organizations can be supported in the fulfillment of their tasks. The research results can also help policy makers to decide if and how they want to invest in the design and development of serious games.

13. Selection of publications of the project participants

- Copier, M. (2003). The other game researcher. Participating in and watching the construction of boundaries in game studies. In: Copier, M. & Raessens, J. (eds.), *Level Up. Digital Games Research Conference*. Utrecht: Utrecht University, 404-419.
- Copier, M. (2005). Connecting Worlds. Fantasy Role-Playing Games, Ritual Acts and the Magic Circle. Available at: www.digra.org/dl/db/06278.50594.pdf.
- Copier, M. (2007). *Beyond the Magic Circle. A Network Perspective on Role-Play in Online Games*. Dissertation Utrecht University.
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