Preface

The incorporation of digital games in adult education, specifically health education, counseling, and therapy appears to be a complex venture at first sight, especially because empirical evidence and evaluation is still lacking in this area. The aim of this book is to show that digital games can be easily implemented as tools to motivate teaching, learning, health education, and communication through single-player digital games, as well as Multi-User Virtual Environments (MUVE), Massive Multiplayer Online Games (MMORPG), and virtual worlds for adults.

The education community has certainly seen an increase in interest for teaching in already existing and popular virtual worlds like Second Life or World of Warcraft, just to name a few. However, the idea of using digital games, MMORPGs, and virtual worlds for teaching is often met with general skepticism and objections from traditionally-oriented instructors. Many consider these tools as too technically complicated for present students who do not have experience in this particular area. The idea of importing and transforming traditional classroom materials into this new medium also seems challenging. In contrast and in reference to therapeutic uses of virtual environments, the plasticity of these digital games offers the opportunity to create simulations that allow students to effectively immerse themselves in a particular subject, and can also serve as a general platform for online education. Through the use of this innovative technology we can both help “digital immigrants” familiarize themselves with the games, as well as finally reach a new generation of learners.

In the field of therapy and health promotion, the idea of using virtual environments for treating anxiety disorders via systematic desensitization or promoting healthy behavior by presenting information in a single-player digital game is nothing new. However, multi-user online approaches are rare in this field. Applying education community concepts could add the motivational benefits for learning and therapy in groups to this approach.

This book aims to offer a key component to any technology-oriented education or health promotion wishing to include virtual environments in its curriculum, or use these as a method of delivering content. We present a combination of up-to-date research projects, small case studies, examples, as well as comprehensive reviews. Both positive as well as negative aspects and experiences are described and analyzed, along with “best practice” and “lessons learned” about the different tasks and methods, so that the reader is sufficiently informed and able to decide on a method of endeavor.

We intend to reach a balance between the theoretical, empirical, and practical chapters. The book includes both essential theoretical and empirical works, and presents applications in Education and Healthcare.

Therefore, the chapters are arranged in four sections:
Section 1: Factors and Key Components of Serious Games and Multi-User Virtual Environments
Section 2: Authoring, Control, and Evaluation in Serious Games for Education
Section 3: Games and Virtual Worlds in Education
Section 4: Games and Virtual Worlds in Health Care

The first, more theoretically oriented section starts with the chapter of Jana Birkenbusch and Oliver Christ who give deep insight into theoretical constructs and phenomena such as flow, immersion, and presence connected to the technological possibilities in games and virtual worlds, especially in the area of health care. Apart from the definitions, the focus lays in the exposition of the relation between the constructs and the methods of measuring. Furthermore, they discuss the questions to improve, apply, and implement these theoretical approaches.

The subject of Alke Martens and Dennis Maciuszek is about the balance of instruction and construction in virtual world learning. They present this dualism between situated learning contexts and instructional guidance in a review of interdisciplinary concepts and instructional challenges. The chapter ends with studies that combine constructivist with instructional elements.

The third and closing chapter of the first section of the book comes from Christopher J. Ferguson. He concentrates on the lively and controversial discussion of the harmfulness of video games, which caused a public debate that influences potentially interested educators a lot when deciding if they should or should not use digital games in their classrooms. Ferguson deconstructs the debate by data-driven arguments to relativize the meaning and impact of violence and aggressive behavior in video games, and demonstrates the potential for education.

The second section of the book presents chapters that describe vital parts of the cycle of building and enhancing Serious Games for education. From authoring and control to adaption, how to foster collaborative learning, and finally how to evaluate Serious Games, these themes are all discussed using best practice examples. Florian Mehm, Christian Reuter, and Stefan Göbel open this section with the presentation of several authoring tools that allow educators, domain experts, designers, artists, and programmers to collaborate interdisciplinarily in the production of Serious Games. Stefan Göbel and Florian Mehm present a model for combing narrative, gaming, and learning components that highlights personalization and adapting as critical aspects. They illustrate the concept by presenting an Educational Game that incorporates that concept both in the authoring process as well as in optimizing the learning process by using adaptive algorithms that change game parameters. Johannes Konert, Viktor Wendel, Kristina Richter, and Stefan Göbel focus on the control of multiplayer games to foster collaborative learning. They clarify certain important concepts of a multiplayer situation, explicate the current research on the phenomena and challenges arousing in peer education including the role and purpose of a Game Master demonstrating feedback, synchronous and asynchronous processes, and suggest how these can be accounted for in the authoring process. Finally, Stefan Göbel, Michael Gutjahr, and Sandro Hardy review classical and current approaches to evaluate the user experience in (Serious) Games, and present newer approaches that also include sensor-based measurements that use psychophysiological data.

The chapters of the third and fourth sections—although still driven by a theoretical background—focus more on empirical findings. They present, analyze, and interpret data collected in various projects in education, professional development, and healthcare. Lessons learned and implications are given both for future research and more refined projects.

The section focused on Education opens with Elizabeth Dean, Joe Murphy, and Sarah Cook showing an example for effects and correlations translating real world processes into virtual environments. The
conditions and their effects on behavior, like filling out a survey in a real world interview, are applicable to an interview in a virtual world, in this case Second Life.

Sue Gregory presents her observations, made over four years, of how students are actually engaged in Second life sessions. She measured engagement using a variety of measures, different categories, subsumed into affective, behavioral, and cognitive components. Her results, based on more than 50,000 lines of in-world conversations, show that all students contributed to the discussions and went beyond what was asked of them.

Daniel Schultheiss and Maike Helm assess the potential of the integration of serious games in general educational schools in Germany. While serious games have a clear potential for development in nearly all fields, some factors hinder their integration. The authors discuss the potentially hindering roles of time consummation, general aversion to computer use, the effort to change teaching plans, and the association of violence with digital games.

Gutjahr and Bösche analyze chat behavior in a paper presentation seminar that was held in a virtual world and point out the advantages of parallel communication channels. Their data of over 500 minutes of recordings show that substantially relevant topics and content was discussed within the virtual world, while at the same time irrelevant contributions happened frequently. They analyze which technical, personal, and situational factors might influence the occurrence of such irrelevant communications, and that—even though they are irrelevant to the seminar topic—could be helpful for an atmosphere of respecting the students.

Steffen Winny closes this section with a review and an analysis of websites dedicated to renewable energy. He delivers a good overview of existing learning offers on the World Wide Web, starting from simple websites up to complex and elaborate games. His review indicates a gap between didactic standards and the factual realizations, and comments on possible enhancements needed.

The fourth section has a focus on the domain of healthcare. Josef Wiemeyer and Sandro Hardy present their research on concepts, evidence, and technology of serious games and motor learning. The new possibilities of whole-body movements to control a game implicate the improvement of motor skills and motor abilities. The authors study how virtual game-based perceptual-motor training transfers to real motor tasks. The chapter presents interesting findings on the mechanisms of transfer at the perceptual-motor level and at the cognitive level.

LeRoy Heinrichs, Li Fellander-Tsai, and Dick Davies show the wider implications for professional development in clinical virtual worlds. The chapter gives an overview of the application of virtual worlds in immersive clinical training. The core of the study are the lessons learned by implementing virtual worlds in clinical settings and the potential of applying it in the whole healthcare sector.

Hannah R. Marston and Philip McClanaghan write about the subject of Exergames, which have gained more importance by the development of new interfaces and technologies. The authors review related theories for a better understanding of the concept of exergames.

The next chapter of the section comes from Oliver Korn, Michael Brach, Klaus Hauer, and Sven Unkauf. It is about the connection of Gamification with the concept of Ambient Assisted Living. They illustrate the role of Exergames for Elderly Persons. By using a prototype, the project group outlines the use of motion recognition and portrays the first results of an analysis to promote physical activity among elderly people. At the end, the chapter gives insight in the future developments of exergames.

The following chapter of Hein de Graaf deals with social inclusion via virtual worlds. Hein de Graf, who is a social psychologist and active inhabitant of Second Live, gives the theoretical foundation for the use of virtual worlds to strengthen the social network—especially of elderly people. Furthermore,
the project VayaV is described as a case study for avatar-based communication, socializing, and community building.

Marcelo Simão de Vasconcellos and Inesita Soares de Araújo give us an insight of Massively Multiplayer Online Role Playing Games (MMORPG) for Health Communication in Brazil. The situation in Brazil is special because there is a need for information about the health of a large population. An approach is to use less normative public Health Communication like MMORPGs. The potential in the area of interactivity, social characteristics, and participation of such games is discussed.

This book should reach researchers, lecturers, therapists, teachers, students, and people working in healthcare who are interested in using new media forms as serious digital games and multi-user virtual environments in their daily work. We would like to refer to university-level courses as well as instructional technologies, distance learning, computer science, instructional design, health promotion, and behavior therapy, just to name a few. We wish to offer practical guidelines and applications of concepts in combination with case studies and reports on state of the art research. To ensure this, the editors integrated a review process between the authors.

The book is an anthology; the chapters describe different themes of the topic, but they are not based on one another.

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