The Design and Use of Simulation Computer Games in Education,
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Introduction

The Design and Use of Simulation Computer Games in Education (2007) is essential reading for anyone interested in gaming, learning and educational innovation. Packed with empirical research, rigorous analysis and practical insight, this book will seriously change the way you think about games. Shelton and Wiley introduced this volume by sharing their cautiously contagious excitement, clearly stating that their intent is neither to advocate for educational gaming nor to provide a game-design instructional manual. Instead, the series editors sought to ignite pedagogical discussion about the challenges, opportunities, and issues associated with the design and use of simulation computer games. By examining research that is empirical and theoretical (from a field where publications are too often based upon advocacy, opinion, and/or anecdotal hype), this book makes a groundbreaking contribution towards evidencing games-based learning as a rigorous and legitimate scholarly pursuit. While Shelton and Wiley's approach juxtaposes an eclectic collection of conflicting theories, diverse methodologies, and compelling ideals, integrating them together within one powerful compilation enables this rapidly evolving area of research to mature beyond its current state as a struggling collection of ideas. I will review the breadth of perspectives presented, paying particular attention to thought-provoking insights, questions, and concerns.

Critical Review

In the opening chapter, "In Praise of Epistemology", Shaffer evidenced a compelling case for getting students to think in new and innovative ways by playing epistemic games. He presented examples from *The Debating Game* to show how students can learn critical thinking and communication skills in game environments by simulating adult professional roles (e.g., doctor, engineer, or architect) to solve real-world problems. The lens of epistemology is key to understanding how Shaffer's epistemic games have merit for providing authentic learning and thinking opportunities, however, as this study focuses on a few randomly selected teenagers, the learning implications are far less certain for younger children. Continued research will help to demonstrate long-term learning gains from epistemic game play with regular students taught by regular classroom teachers, as well as to advance understanding of the complex interrelationships between new technologies, teachers, resource availability, and curriculum. My favorite moment in this chapter is Shaffer's description of school as an epistemic game. He profiled the modern "Game of School" and its hidden curriculum to persuasively argue that: "we need to build better educational games than industrial *School*" (p. 23).

"Six Ideas in Search of a Discipline" (Chapter Two) provides fundamental discussion about the history of and future for the field of DGBL (Digital Game Based Learning). Van Eck used a theoretical approach to illustrate how DGBL is not: "a new way of learning so much as it is a very efficient way of embodying some of the most effective learning theories known to the learning sciences" (p. 41). Although it is increasingly valued as an effective learning medium, Van Eck argued that a focused, longitudinal, and collective research agenda is needed to establish and grow DGBL as an academic discipline (beyond its current state of individuals researching in a haphazard fashion). As simulation computer games hold considerable pedagogical power, I believe this chapter raises important questions for DGBL research to investigate—however, as Van Eck cautioned: "we have a window of opportunity here, and the need for real educational reform may never have been stronger, but that window will not stay open forever" (p. 56).

In Chapter Three, "Building Bridges Between Serious Game Design and Instructional Design", Kirkley, Kirkley, and Heneghan generated strategies to merge together the best aspects of instructional design with game design, believing that these two fields must come together for the industry to productively mature. Using a narrative-based methodology, the authors present a series of conversations from the viewpoints of instructional designers and commercial game developers. Their goal was to: "help the field move past broad generalizations stating that instructional designers suck the fun out of games and game designers suck the learning out of games" (p. 61). This chapter is not intended to be a definitive guide of best practices for designing, developing and researching game environments, rather, the authors wanted to generate open and ongoing dialogue amongst gamers, game designers, instructional developers, theorists, and educationalists. Not only is Kirkley et al.'s interview approach entertaining to read, I believe it offers a real opportunity for synergistic thinking (as opposed to focusing on tensions and differences) between the proliferation of communities involved in the design and use of educational gaming.

"Layered Design in an Instructional Simulation" (Chapter Four) projects the light of knowledge upon Schön's theory of layers to analyze the design of an instructional simulation created as a museum display. Gibbons and Sommer show how boundaries can converge between game-design theory, narrative theory, and instructional theory to create a single coherent design experience. Although this chapter challenges me to think differently about the design of educational experiences (as well as the controversies associated with using games in formal learning environments), I am unsure how the museum's instructional simulation directly and effectively translates to learning beyond the mere consumption of facts and information.

In Chapter Five, "Designing Educational Games for Activity-Goal Alignment", Shelton enlivened a provocative debate between the goals and the practices of educational game designers, instructors and researchers. I am left wondering, however, if it is useful or merely a waste of time to combine traditional school instructional methods with new games-based learning approaches? I thank Shelton for: 1) providing an extensive list of valuable references, and 2) creatively juxtaposing his theoretical perspectives on simulation games with excerpts from the simulated worlds of Lewis Carroll's *Alice's Adventure in Wonderland* and *Alice Through the Looking Glass*.

In Chapter Six, "The Peripatos Could Not Have Looked Like That," and other Educational Outcomes From Student Game Design", Moeller, Cootey and McAllister employ Mwanza's eight-step activity theory to evidence how educational experiences are enhanced when students participate in game design and development. As my own research investigates *Girls, Games and Designerly Ways*, I appreciate this chapter's empirical focus on learners as designers—effectively moving the research agenda beyond *what* we learn by playing games to *how* we learn by creating them. Educational researchers may want to seriously (re)consider using Mwanza's activity theory as an analytical framework for organizing a large matrix of dynamic research elements (for example, the iterative game developments and the evolutionary levels of student learning outcomes in this study).

"The Quest Atlantis Project: A Socially-Responsive Play Space for Learning" (Chapter Seven) by Barab and nine co-authors presents empirical evidence from a popular 3D multi-user environment to analyze how shared gaming simulations can teach children social awareness, responsibility, and citizenship. Due to the ubiquitous presence and enculturating power of video games, I agree with the authors that it is an educational and societal imperative to create games that equitably engage all children as "digital video games provide an important experiential space for supporting meaningful learning, and that it might behoove educators to understand and leverage this powerful medium" (p. 184). This chapter brings forth many issues for the design and use of serious games, as well as the serious games movement that rapidly emerged in the past decade (distinguished by serious games journals, serious games conferences and serious games university courses). I believe that a more rigorous understanding of how we learn within the interaction-rich communities of simulated environments (like *Quest Atlantis*) will contribute to our hopes and dreams for revolutionizing education, not only the outcomes, but how we define and understand it.

"Massively Multiplayer Online Gaming as a Constellation of Literacy Practices" (Chapter Eight) advances critical understanding for the literacy practices of massively multiplayer online games (MMOGs). Steinkuehler examined data from a two-year online cognitive ethnography of the MMOGs Lineage I and Lineage II, surveying gamers from both contemporary and traditional points of view to conclude that gaming: *"is not replacing literacy practice but rather is a literacy practice"* (p. 210). Steinkuehler effectively historicized the long-standing fear and contempt towards video games, and then offers a more positively productive and accurate way for framing the gaming practices of today's youth. She argued against grouping all of the diverse video games together as the primary cause

for the alleged modern day literacy crisis as this false assumption is based upon vague definitions of both video games and literacy, in addition to ignoring current research that identifies the literary aspects of gaming. The overarching message of this rigorously-written chapter is worthy of careful consideration: given the *massively* influencing, *massively* connecting and *massively* enculturating power of today's *massively* popular simulation games, we must *massively* understand the associative impacts and effects of immersive and persistent game play.

"Robust Design Strategies for Scaling Educational Innovations" (Chapter Nine) analyzes user experiences from the large-scale implementation of an educational multi-user virtual environment, *River City MUVE*. Nelson, Ketelhut, Clarke, Dieterle, Dede and Erlandson concluded that design scalability is critical for the sustainable development of simulation games to support learning, despite the fact that "the more complex the educational innovation and the wider the range of contexts, the more difficult it is to move a new practice from its original setting to other sites where its implementation could prove potentially valuable" (p. 209). The authors identified key support issues (financial, technical, cultural, and pedagogical) that must be addressed to successfully support and implement game projects as curriculum in formal school settings. I appreciate how the six co-authors are not afraid to take on the complex task of evolving simulation games beyond their ideal settings to more challenging contexts of practice. As games often fall short of the high expectations set by the educational community at large, it is important to create detailed taxonomies that validate how and why games are useful for learning in specific contexts. This chapter clearly shows how robust models for educational innovation must be co-constituted by an empirical body of practice as well as informed theoretical debate.

Hay's research in Chapter Ten, "Building the Wrong Model: Opportunities for Game Design", boldly compared the *Virtual Solar System* (VSS) astronomy project to the MMORG game *World of Warcraft* to confront the misconceptions that exist about using 3D simulation games in school learning contexts. While I find that Hay's "Keys in Architectural and Context Design for Educational Games" (p. 258) contributes an original model for constructing and comparing gaming environments, it does not adequately address how, if and when simulated game learning translates to the real world. A better understanding of these issues is critical for future research models that can connect gaming environments to align with educational learning environments.

In the book's final chapter, "Wherever You Go, There You Are: Place-Based Augmented Reality Games for Learning", Squire and six co-authors described yet another theoretical framework to support the design and use of simulation games for pedagogical purposes. With the goal of building theories of learning through game play, Squire and his team researched three virtual reality games created by students ages 10-16: *Mad City Murder* (a mystery game for environmental science education); *Dow Day* (a simulation of historical events from a first person perspective); and *The Greenbush Game* (an alternate reality game where students are the game researchers, designers and players). Each game focuses on designing solutions to game challenges using an experiential and situated learning approach. As simulation games have yet to demonstrate long-term learning gains, this chapter makes a useful contribution by: 1) providing detailed examples of what simulation games for learning look like; and 2) describing the learning that occurs when students play them. As we look towards games to teach and inspire us in meaningful ways, however, and as all of the diverse authors in this book advocate, a focused research agenda with focused plans is needed to warrant research conclusions and to create meaningful change.

Is There a Pedagogical Future for Simulation Computer Games in Education?

Fast forward to the school from the future: how might you imagine the role of simulation games in teaching and learning environments? Research from this volume reveals that this future is already here—the foundation for educational gaming has been built and groundbreaking projects are now being developed, tested and refined. Each of the eleven chapters in this series contributes solid research findings to collectively evidence how gaming can improve education by making it more meaningful, responsive and authentic for students. Heeding the advice of Shelton and Wiley, however, we need to be mindful of critical research, especially as gaming evolves from a rather vexed history to a much sweeter spot within the education industry. Now is not the time for passive acceptance: it is the time for paying careful attention and continually questioning the roles that games can and should play in the post-industrial school. What kind of future will we shape by playing simulation computer games in formal educational settings? What kinds of games will we need to design in order to learn and practice the social, organizational and technological skills required to participate in the global culture of the 21st century? As awareness and interest in gaming proliferates in our rapidly changing educational landscape, I believe that Shelton and Wiley's

compilation will continue to serve as a discipline-building resource for advancing a critical understanding of the design and use of simulation computer games in education.