BOOK REVIEW

The Design and Use of Simulation Computer Games in Education

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Brett E. Shelton and David A. Wiley (Editors)
The Design and Use of Simulation Computer Games in Education (Paperback)
Sense Publishers
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This collection of essays is timely, and I congratulate the publisher on both creating the overarching series (“Modeling and Simulations For Learning and Instruction”), and for providing a variety of ways to access the contents. One can buy the book, download a secured PDF, or download printable PDFs of the individual chapters from the Web site of the first co-editor.

INTENDED AUDIENCE

The book includes chapters from some well-known and respected academics in the field of educational games, who are either making a case for a more disciplined approach to games for learning (often with an instructional designer background), or are describing one or two projects used in the North American K-12 classroom or university.

The book’s intended audience may well be a classroom teacher interested in adopting or designing game technology as a learning tool. Yet there are chapters defending the use of games in education, or summarizing general instructional design theory, so it may appeal to those interested in sourcing references for academic debate.

ORGANIZATION

The book is divided into two sections, “Design” and “Use.” While some of the chapters don’t sit exactly within either section label, an editorial overview and brief introduction to the theme of each chapter is welcomed.

In the first chapter, Shaffer uses a real-world classroom debating game to show how students can be engaged by history, and learn to develop better critical and
communicational skills. He also makes the interesting observation that history students do not assimilate the skill of professional historians in knowing which sources are more accurate than others. According to Shaffer, games can help teach different belief systems (he calls such games *epistemic*), and these games allow students to reflect on such belief systems. He believes not only that traditional schooling finds this anathema, but also that traditional schooling has failed to truly educate students in a rapidly changing era of innovation.

“Six ideas in search of a discipline” by Richard Van Eck complains about the dispersed nature of the game studies discipline (or lack of discipline), and states there are few examples of effective serious games; yet despite this--Van Eck claims “digital game-based learning” has many potential advantages, despite not yet reaching maturity as a discipline. The author proposes three challenges and ten ideas to improve the field of digital game-based learning, and suggests four principles of learning that “immersive adventure and adventure hybrid games embody;” however, the latter is discussed in depth in a different anthology (edited by Gibson, Aldrich, and Prensky).

The third chapter, “Building bridges between serious game design and instructional design,” by Jamie Kirkley, Sonny Kirkley, and Jerry Heneghan, is a hybrid chapter-interview. They propose a “first person explorer” genre inspired by *Virtual Heroes*. For them, all games are interactive and are simulations, but simulations are not necessarily interactive, and not necessarily games. Further, games differ from simulations in that they favor entertainment over reality. Rather than suggesting that good serious games are like instructional environments, the authors’ believe that good instructional environments are like games.

Chapter 4, “Layered design in an instructional simulation,” by Andrew S. Gibbons and Stefan Sommer, recounts how they were inspired to transfer Schön’s theory of layers in architectural design (from his famous book, *Educating the reflective practitioner*), to the interface design of serious games.

Chapter 5, “Designing educational games for activity-goal alignment,” by the co-editor, Brett E. Shelton, explores what should be the goals of educational game designers and researchers. Shelton believes a goal should be to design educational games for players of varying abilities and he lists other “essential” criteria. He suggests there are three types of educational games, those designed for entertainment, for educational outcomes using reward systems, or those designed for learning but that have too many distractions.

The subtitle of chapter 6, “‘The peripatos could not have looked like that,’ and other educational outcomes from student game design” refers to the authors’ student game designer demonstrating newfound knowledge of how an historical scene could not be recreated, which was learnt from researching the game design, but it was not an intended educational outcome. The chapter itself details various projects that recreated parts of ancient history.

Section two of the book, entitled “Use,” has five more chapters. I presume the short introduction is by the editors, but it would have helped if their names were on the piece. Also, the introduction says it will describe the first three chapters of the second section, but only describes two.

Chapter 7, “The Quest Atlantis Project: A socially-responsive play space for learning,” by ten (ten!) authors, has been
published widely, so you may not find much new information here.

Chapter 8, “Massively multiplayer online gaming as a constellation of literacy practices,” by Constance Steinkuehler, tries to champion games as a serious medium.

Chapter 9, “Robust design strategies for scaling educational innovations,” by six authors, describes the deployment of River City, a multi-user virtual environment and describes a user survey of the game.

Chapter 10, “Building the wrong model: Opportunities for game design,” by Kenneth E. Hay, describes astronomy simulations used for learning. Then it turns to the success of World of WarCraft, but as a model-builder. Hay distinguishes a model builder from a simulation (where the models are already built).

The final chapter, chapter 11, is entitled “Wherever you go, there you are: Place-based augmented reality games for learning,” written by Kurt D. Squire, Mingfong Jan, James Matthews, Mark Wagler, John Martin, Ben Devane, and Chris Holden. They describe experiential learning developed via games that are place-based augmented reality systems. They suggest games should develop worlds that players can enter, perform in, and inhabit. Further, they believe educators should leverage “the fantastical about particular academic domains.”

CRITICISM

I am happy to report that this book is not weighed down by esoteric terms but there are a few exceptions. For example, the first chapter, “In praise of epistemology” argues for epistemic games, which the writer David Shaffer defines as “a game that requires you to think about the world.” We do need a concise term for such a game, but I am not convinced by this use of the word “epistemic.” Epistemology is the (philosophical) study of what constitutes beliefs and knowledge, but episteme merely means a belief or piece of knowledge, so I’d argue that “epistemic” by itself does not equate to affording reflection on a purported belief system (which is the type of game I believe the author wishes to promote). Epistemic is a word belonging in the “trying too hard to shock and awe” basket along with “ontological.”

This chapter also reflects a worrying tendency in the book of mentioning efficacious knowledge transfer without explaining how it is done. Shaffer’s chapter does not clarify how computer games can pass on reflective knowledge. The assertion that the debating game he describes could easily transfer to a computer game setting is also not proven. Surely the spontaneity and physical presence of real-time debating combatants is not such an easy task to replicate via a computer? I have enjoyed David Shaffer’s writing in the past, but I still cannot see how these musings are directly and effectively translated into educational computer games and simulations.

Similarly, Van Eck’s argument that game-based learning can be a panacea for education is based on intuition rather than theory. These are observations I would have trouble arguing with, but they are hardly original ones. Van Eck does claim (and I agree) that scholars such as Malone made advancements in the field, but I would have to question his assertion that populist writers such as Marc Prensky have really taken the carefully modulated research of Thomas
Malone further. Van Eck’s discussion of Robert Gagne’s theory of learning is far more interesting, and I wish he had focused on just such a theory rather than to make claims about the entire field itself.

The assertion that game-based learning should be about effective learning principles rather than about fun, seems counter to his next claim that people in the field have shown that commercial games can be effective learning tools. Nowhere in the chapter do I see any evidence that fun is or should not be part of digital games as effective learning tools. If the author has spent twenty-five years or so defending the use of games as effective learning tools, perhaps more focus on how those games work and how principles can be used in other games would have improved the chapter. As Richard Van Eck himself admits, his three challenges (generate and validate DGBL models, generate guidelines for practice, generate a body of high-quality DGBL) does not tie neatly into his subcategory of ten suggestions, which read more as his personal research aims (for example, why is the study of twitch games and visual processing a sub-category?)

Next up is the Kirkley et al chapter/interview. This genre, if it is a genre, sounds intriguing, but it is hard to get a handle on exactly what this new genre is and the references are to unpublished documents I have not found via the Internet. Surely it involves more than “the challenge is man vs. nature or man vs. machine, not man vs. man”? How a “first person explorer” game helps the development and employment of serious games as a field remains a mystery.

Chapter 4 is the first chapter to describe and portray an actual game, but I am not yet convinced of the effectiveness of transplanting Schön’s theory to two-dimensional interfaces that feature an embedded video. It would also be instructive to see how the learner actually does reflectively learn, and does not just click through until the whole video has finished.

Chapter 5 highlights some more general issues I have of the book as a whole. Why these long-winded titles that are already covered by the book’s title? Why do authors keep referring back to past references rather than explain key concepts in detail? I suspect this anthology is actually a quickly published collection of revised conference papers.

At least Chapter 6 has an interesting (if misleading) title, “‘The peripatos could not have looked like that,’ and other educational outcomes from student game design.” I said misleading, as it is not clear how the game described is actually peripatetic in the Ancient Greek sense. Nor are the authors clearly saying what for me has been an epiphany: building a game is a huge yet undocumented learning experience for any game designer, so let the learning develop through the students being the game designers and not just the players.

Historical and heritage-based games has been my main research area so I admit to bias here, but I do find this chapter readable, lively, and more directly embedded in the actual issues of educational game design. Still, it is not obvious what exactly the player does, and what is meaningfully learnt, and whether the player can separate gaming fiction and counterfactuality from historical reality.

Chapter 7, “The Quest Atlantis Project: A socially-responsive play space for learning,” as I noted previously, been published widely. The scale of the playing market is detailed well, but like the other chapters it would still be easier to comprehend the
game and gameplay with pictures tied to core game mechanics.

Chapter 8, “Massively multiplayer online gaming as a constellation of literacy practices,” by Constance Steinkuehler, is well written and suitably polemic (this is code for me saying I don’t always agree!). However, it does not seem to fit easily into the collection (it is not directly about instructional games) and I am not sure what a serious game designer would gain from reading it. Certainly we may all be guilty of writing chapters in support of games as a popular or educational medium while quoting *World of Warcraft* stats, but in a specialist book such as this the chapters do not need to cover old ground again and again.

Chapter 9, “Robust design strategies for scaling educational innovations,” by six authors, describes the deployment of River City, a multi-user virtual environment. This chapter does feature diagrams and figures, but they could be more readable. Also, the survey of the game does not seem to directly evaluate the user experience of the game, nor does it evaluate how relevant the learning outcomes are to the curriculum. And again, the core mechanics could be described more fully.

While Kenneth Hay’s chapter 10 makes an interesting if unusual distinction between model and simulation, I personally find the link between astronomy simulations and characters in *World of Warcraft* to be a tenuous one. Nor do I quite understand how learning through mistake-making as described in the astronomical simulations is also evident when building a paladin in *World of Warcraft*. And again, the illustrations could be improved; they are small and hard to read.

Despite the shouting in the title, chapter 11 was my favorite. There are numerous illustrations, there is an attempt to describe both the learning potential of augmented reality and specific user experiences, while scenarios and suggestions for game design do not try to skirt around the issue of how to incorporate both fact and fantasy in a serious game. Some readers may wonder if this chapter is at odds with the others, but to my mind it showed real-world applications that carefully considered the relationship of technology, learning content and audience.

**SUMMARY**

Apart from the final chapter, I have struggled to find much content I could directly use in teaching students how to design games for learning. An opportunity for instructional designers to explain their discipline to game designers (and for game designers to respond in kind) has not been fully captured, for most of the chapters try to cover too much ground. I would have preferred the writers to focus on specific theories, interaction modes, genres, or individual case studies, and much old ground could have been omitted.

The style of writing could have also been more accessible; and reminds me of my initial suspicion that many of these chapters may be hastily revised conference papers. This is a shame, as the aim of the book is laudable and significant, but the chapters are simply too hurried. So I would probably not buy the book myself, or list it for a game design class, however I might refer graduate students to specific chapters for some thought-provoking debate.