

## BOOK REVIEW

# Leading Issues in Game-Based Learning Research

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*Leading Issues in Games-Based Learning Research*

*Thomas Connolly, Ed.*

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This collection of eleven papers published between 2007 and 2010 offers a summary of some of the major approaches currently adopted by European researchers working in the domain of Game-Based Learning, and shares empirical work derived from actual implementations of GBL applications. Within the book, a broad range of concerns and challenges are addressed: the meaningful implementation of adaptive learning, the potential of mobile activities to support recall, the importance of supporting learners' reflection, ways of encouraging learner engagement, and existing barriers to the greater uptake of digital games as a learning tool. The notion of 'game', too, is understood broadly, from Huizinga et al.'s "Frequency 1550" mobile learning system distributed across Amsterdam, to Gonçalves et al.'s "Laboratorium", situated in the real-world context of a teaching hospital,

and making reference to a range of 3D worlds and business simulations along the way. In acknowledging this breadth, the volume accurately reflects the diverse ways in which GBL can be manifested. The book is a reflection of current approaches to GBL in other, less fortunate aspects, too: the papers collected here, while valuable and often thought-provoking, display little engagement with relevant work from authors in related fields of education research, games studies or commercial games development. Consequently, the collection risks giving the impression that the field of game-based learning, for all its vaunted interdisciplinarity, can sometimes turn to the parochial. Nevertheless, there is much of value within the collection, and for researchers looking for formal ways of structuring learning game design, or systematically describing learners' progress, the collection is well worth reading.

First published in 2011, the collection is edited by Professor Thomas Connolly of the University of the West of Scotland. Professor Connolly is based in the School of Computing, and alongside recent publications addressing games-based learning has published widely on database design and online learning. The

book initially claims to speak to institutional and strategic concerns, though it subsequently appears to privilege a concern for the technical, rather than pedagogic or sociological, aspects of learning with digital games. The key figures in the book are researchers and developers, whose needs and interests take centre stage: learners and teachers occupy a secondary position, narrowing somewhat the audience who might be interested in the book.

The book does not seem to be structured around any particular organising principle, and it might have been beneficial for the reader to make the thematic connections between papers more visible. It begins with a brief introductory chapter from the editor, in which games are characterised as one way of “delivering” teaching and learning in a more “efficient” manner, some advantages of game-based learning are described (though not referenced) and a number of areas of concern for researchers are outlined: more empirical data supporting the claim that learning games are “effective” are needed, developers and educationalists must find ways of working together, contexts and groups for whom games are particularly effective must be identified, tools that enable learners to create their own content must be developed, assessment must be added “seamlessly” to games, new physical gaming technologies must be understood and adopted, and forms of learning particularly suited to virtual worlds should be developed. These are familiar calls within game-based learning, and reflect an equally familiar conception of the relationship between learning and technology, one that portrays technologically “enhanced” learning as an inevitability and the researcher’s task as working to overcome any resistance to it. The implication is that the papers following this chapter each address these concerns in some way, though again it might have been helpful for the reader to have the connections between these challenges and the rest of the book made more explicit. Consequently, while each of the papers collected here clearly makes some contribution to better understanding how games

might support learning, it is hard to discern a theme that unites them as a whole.

Following this introduction, eleven papers are presented, each with a brief introductory note from the editor. This feature might be a welcome support for the reader, with the potential to set the paper in context and perhaps relate it to other papers in the collection: however, these notes are often largely restatements of the original abstracts, and in two cases neglect to mention the studies’ shared provenance (the ELEKTRA project, which gave rise to the work reported by Kickmeier-Rust et al. and Peirce & Wade). The original publication details of each paper might also have been usefully shared in these notes: in the review text, however, there is no mention of the original venue or audience for which the papers were written. The majority of contributors appear to write from within a cognitive or psychological tradition, although sociocultural and ethnographic approaches make a brief appearance in two papers (Gonçalves et al. and Meyer & Sørensen). However, the emphasis throughout is generally on the practical and tangible, rather than the theoretical or abstract, with every contribution situated in the context of actual game use, and this emphasis on empirical work offers readers something to engage with regardless of their own particular theoretical or methodological leanings.

So what are the leading issues in game-based learning, as reflected by these papers? The general shared goal of the papers here is to demonstrate some sort of cognitive impact associated with playing a game designed for learning — among other factors, authors look at recall (Huizinga et al.), performance in problem-solving (Bottino et al., Kickmeier-Rust, et al.), affect (Huizinga et al., Wouters et al.), and appropriation and identity (Gonçalves et al.). This common effort might suggest that, for some researchers, one current issue remains the need to demonstrate unequivocally that playing learning games leads directly to measurable learning. Just as well-rehearsed in the field, and as well-represented here, is the tendency to seek frameworks to support the

design of particular forms of learning game: here we have an adaptation of the widespread SCORM framework for developing reusable game components (Bisognin et al.), an analytic system for mapping player progress through a defined problem space (Wouters et al.), a way of analysing networks of competencies (Kickmeier-Rust et al., Peirce and Wade), and a model of “problem-based gaming” from Kiili et al.

The issue represented in this collection that seemed both novel and likely to remain of interest to researchers for some time to come is adaptive learning, with two contributors in particular concerned with ways of capturing players’ progress and ability, and responding appropriately, presenting them with material that suits their learning needs. Kickmeier-Rust et al. offer a formal framework for describing a player’s progress through a map of related competencies, enabling a game system to offer “micro-adaptive feedback” tailored to individual players: they suggest that this should be used to ensure that interventions do not disrupt flow and engagement. Peirce and Wade draw attention to the risks of inappropriate personalisation (“inconsistent game characters” and a “confusing game world”), and describe an implementation of a similar feedback system within an example of the casual gaming genre. While these approaches raise many questions that will no doubt continue to occupy researchers (how do learners share experiences with each other? how different can individual game histories be while still preserving a common object of discussion for communities of learners?), the two accounts here provide a robust starting-point for those interested in implementing adaptive systems in their own work. A related issue of importance for the field is the way games might promote reflection and metacognition, a topic addressed from a solid theoretical base by Vogel.

The majority of papers employ some sort of quasi-experimental, quantitative approach towards assessing the impact of a game, with just two contributors writing from alternative perspectives (Gonçalves et al. and Meyer & Sørensen, who situate their work within

sociocultural and ethnographic perspectives respectively). This would seem to reflect the editors’ assertion that “there has been little research on how culture impacts the use and adoption of games-based learning”. But this view is hard to reconcile with the prominence within education research of work from researchers motivated by an interest in the place games occupy within wider cultures of learning and being. The importance of culture and wider social contexts in understanding learning with games is central to the work of (for example) Caroline Pelletier, David Buckingham, Andrew Burn, Henry Jenkins, Kurt Squire and James Gee, to list just some of the more established authors in the field. Gee’s book, “What Videogames Can Teach Us About Learning And Literacy” (Gee, 2003), a seminal text for current research into games and learning and cited by a number of contributors here, builds on his work exploring the role of discourse in constituting and representing social identity (an example of the kind of theoretical resource Wouter et al. neglect to draw upon in their exploration of discourse in games).

While the collection seems solid on many technical aspects of implementing GBL projects, then, the book appears to display only a limited engagement with wider theoretical considerations: sociological perspectives on the relationship between play, technology and learning, for example (Selwyn, 2012), or understandings of the relationship between pedagogy and learning drawn from education research, or with the discussions taking place within games studies on the nature of games. A more significant engagement with these principles would have significantly strengthened the collection. A lack of reflection or criticality towards the way learning, game design or the practice of research are represented means that notions of knowledge, learning, and technology are left unchallenged and treated as solved problems, and methodologies are adopted without clear theoretical grounding.

The collection similarly displays an apparent reluctance to engage with current thinking in the game development community on player

motivation and game analysis. Commercial developers working in the entertainment market have given a great deal of thought to developing formal design frameworks and to understanding player behaviour, and some of this material would surely be relevant to many of the teams whose work is represented here, such as the 'MDA' framework, developed by Hunicke et al. (2004), in which systematic consideration of the mechanics, dynamics and aesthetics of a given game ensure equal consideration is given to the player experience and the underlying systemic elements, or Jesse Schell's (2008) model of game development and user experience.

In summary, this is a useful and informative collection of papers that describe some fascinating and original projects and will be of some interest to researchers in the field, particularly those with an interest in connecting adaptive systems with demonstrable cognitive effects. However, the lack of engagement with wider currents of thought from education research,

commercial game development or even other researchers in the same field belies the intention to capture the range of concerns currently occupying researchers in game-based learning.

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