

## Deconstructing games as play: progress, power, fantasy, and self

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**Abstract** In this issue, I draw together two sets of papers, with apparently different agendas. Most of the original papers in this issue use various learning perspectives and research approaches to explore the challenges and affordances of digital games for learning science. Associated forum papers challenge the authors and us to critically examine our own approaches to developing learning resources that model experiential phenomena, analyzing data and making claims. I locate all these studies within Brian Sutton-Smith's philosophy of play. The other set of papers critically examines neo-liberalism and globalization within a consideration of the dimensions of science. I argue for a synergy between both sets of papers.

**Keywords** Science · Play · Games · Tools

Over the past 4 years I have been involved with colleagues in research on the development of digital games for learning in the fields of science and mathematics for both in school and afterschool contexts. My involvement began because of my association with the Create Lab developed by a cognitive scientist and multimedia developer, Jan Plass. His excitement about how games and game structures could support learning also challenged my thinking about this area, as do the papers in this special issue. On the other hand, my appreciation for the minor role ascribed by the science education community for games in science learning was highlighted by my experience at the 2010 National Association for Research in Science Teaching (NARST) meeting which had the theme of *Research in Practice: Practice Informing Research*. I was excited to see on the program a symposium, *Investigating Virtual Learning Environments in STEM Education*, and noted that some of the presenters were well known in the fields of virtual environments and games research. However, my memory of this event was that it was located in a small room that was hard to

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find and the symposium was poorly attended, suggesting to me that digital media, including games, had a low profile in the NARST research community. I wondered why there seemed such a lack of attention given to games in the science education literature and my experience of that symposium initiated my interest in this special issue.

## Games and play

When I think of games, I first think of play. And, like Lloyd Reiber (1996), I think that little attention has been given to play in learning science. The notion of play has a complex history in science education since David Hawkins (1974) penned his famous “messaging about in science” paper on the role of play for people, particularly learners, to begin to understand the limits and possibilities of the experiential world in which they lived for asking and exploring questions in science. Much early research on play comes to us from anthropology and psychology where the perspective of the researcher tends to be that of an outsider. Recognizing the value of insider perspectives initiated my selection of Forum authors for this collection with a critical, insider perspective.

## Rhetoric of play and games

Reiber (1996) notes that play is usually associated with young children and playing is something you are supposed to stop as you mature. Culturally, play is often understood as a frivolous activity that is not challenging or difficult but as researchers have shown in these manuscripts, there is nothing easy or obvious about playing games. Play is important for both learning and socializing and is experiential, typically voluntary, intrinsically motivating requiring active engagement, and often has a make believe element (Reiber 1996). In his edited book, *The Future of Play Theory*, Anthony Pellegrini (1995) organized the book contents into sections based on the work of play philosopher, Brian Sutton-Smith. Sutton-Smith (1997) outlined seven rhetorics of play including progress, fate, power, identity, imaginary, self and frivolous, which Pellegrini limited to play as progress (for something useful), play as power (associated with competition), play as fantasy (creativity), and play as self (for personal satisfaction).

In this issue, the collection of original papers on digital games and science learning, which provide the foundations also for the forum papers, can be classified as exploring games supporting *play as progress* to learning something useful, like citizen science (see Gaydos and Squire), life of a plant (see Muehrer, Jenson, Friedberg and Husain), or scientific possible selves (see Beier, Miller, and Wang) and *play as self* (see the case study by Bricker and Bell and the examination of ethics and game play by Muñoz and El-Hani). Sutton-Smith (1997) argued that boys playing with “war toys” was just play (not reality) echoing perhaps the arguments of Yupanqui Muñoz and Charbel El-Hani in their paper, *The student with a thousand faces: From the ethics in video games to becoming a citizen*, in which they examine the possibility of using violent video games, such as *Fallout 3*, to examine the ethics associated with othering. Forum authors, Matthew Marino and Michael Hayes, are not convinced by the arguments of Muñoz and El-Hani, making the case that educational games, of which they provide examples, are more inclusive than the commercial games explored by Muñoz and El-Hani and have the potential to foster “civic scientific literacy across a diverse range of students while promoting cross-cultural understandings of complex scientific concepts and phenomena.” Forum author,

Helen Kwah, also has concerns about how the use of games, like *Fallout 3*, would be facilitated in classroom situations since the integration of resources like games into classrooms remains an open question.

In the collection of papers associated with Leah Bricker and Phillip Bell's case study, "*God Mode is his video game name*": *situating learning and identity in structures of social practice*, play as self provides the rhetorical stance as their youthful protagonist is challenged to cope with the tension between the culture of the classroom and the culture of the family, which seem so at odds with each other. Bricker and Bell explore how their protagonist's identity is associated with being an expert game player and how that identity plays out in the context of the classroom. In her forum response to their paper, Melissa Biles has some suggestions for how research can move beyond acknowledging the contradictions of these contexts to asking ourselves how the elements of the social affordances of games can be integrated into the practice of teaching and learning. Of course, there is also the challenge of not idealizing play and associated digital games, including those developed for learning, and looking with a critical lens at the implicit cultural othering, which Muñoz and El-Hani identified in the commercial games they studied, but which is also likely present in educational games.

Will Wright, brought to life in Dixie Ching's Key Contributor paper, *Passion play: Will Wright and games for science learning*, seems driven to develop games with a different rhetoric, one that presents play as fantasy. As Ching notes in her article, Wright thinks of his games more as "possibility spaces" and "imagination amplifiers" than as well defined action scapes. Wright's games allow players to explore their creativity within the expansive confines of a game space.

The power of the set of papers presented in this issue is that they also allow us to observe the conflict that can emerge when two of these perspectives on play collide as they do in the collection of papers anchored by Trevor Owens' manuscript, *Teaching Intelligent Design or sparking interest in Science? What players do with Will Wright's Spore*, which presents play as fantasy. For science education researchers, Wright's *Spore* creates a conundrum because the game of *Spore* is not constrained by scientific veracity but allows the player to exercise their creativity in determining the direction of evolution in the game. Owens and forum authors, W. Max Meyer and Jonathan Frey, explore variable and conflicting responses to the game mechanics and content. Such conflict was not unexpected when a discipline, like science, in which practitioners hold strong opinions about the borders of the field and where powerful discourses that serve to frame these borders, interact with the creative imagination and economic pragmatism of the commercial digital game industry.

### Science education and play as progress

The notion of play as progress seems powerful in the history of games in science education because it overlaps nicely with the use of simulations in learning science. In 1980, D. R. Cruickshank and Ross Telfer claimed that although games and simulations were relatively new instructional tools, they had arrived. Cruickshank and Telfer (1980) defined games as contests in which players operated under rules in order to gain a specific object. Consistent with play as progress, they differentiated between academic and non-academic games, defining academic games as those based on learning. For them, the rules of academic games could be transferred to other situations or contexts, which was also a goal for the games explored by Rachel Muehrer, Jennifer Jenson, Jeremy Friedberg and

Nicole Husain in their study of student learning associated with games developed around the life of a plant reported in their study, *Challenges and opportunities: Using a science-based videogame in secondary school settings*.

Muehrer and her colleagues were not hopeful about the affordances of learning associated with games, especially when the game implementation was fraught with contextual challenges. As one of their forum authors, Marjee Chmiel, noted, “users do things differently than designers think they should. In that respect, the finding that students learned *about* the game (that is about how to achieve the goals in the game) instead of learning the intended content of the game is a critical reminder of what students bring into the classroom.” She argued that we need studies like that of Muehrer and her colleagues because it helps us to understand more richly how digital games and science education intersect when active agents are involved. The challenges associated with integrating games into classes were also the focus of the forum paper by Lee Yong Tay and Cher Ping Lim who argued that contextual factors are “like a web on the wind, highly structured but difficult to detect until one looks carefully,” highlighting the importance of studies like that conducted by Muehrer, and her colleagues. Tay and Lim also explored further the issue of how we can understand engagement and whether there is a difference between engagement in the game mechanics and engagement with the content. The tension between engagement with the content and engagement with the game mechanics represents a conundrum that is thoroughly explored in this set of papers.

In the cluster of papers associated with Matt Gaydos and Kurt Squire’s consideration of learning citizen science in *Roleplaying Games for Scientific Citizenship*, we are reminded by both Deborah Tippins and Lucas Jensen and Ruth Schwartz of the tension representing the complexity of experienced ecologies, ecologies in the wild, in the virtual world of an immersive game. As Tippins and Jensen note in the virtual world of a game, the complex ecology of a lake is modeled and simplified, so some of the openendedness of the real world is lost. However, they acknowledge that a game-based version of citizen science provides a level of kinetic possibilities for representing citizen science difficult to achieve in the “real world”. In a mixed method study of developing a survey instrument to assess scientific possible selves from game play, Margaret Beier, Leslie Miller and Shu Wang in *Science Games and the Development of Scientific Possible Selves* engendered a range of responses from their forum authors. Elizabeth Hayward used this study for a broader rumination on how researchers decide on the reliability and validity of the instruments they develop and use, which should be a focus of consideration for researchers of all persuasions. Darshanand Ramdass and Mubina Khan reflect on the developmental and situational nature of possible selves as part of our identity, which may be captured more richly through the use of other research tools.

Additionally, Sanaz Farhangi brings a cultural historical activity theory lens to her review of Jane McGonigal’s book, *Reality is Broken* (2011) to suggest how a gamer mindset can help us to be more thoughtful and creative about how we engage with the practices associated with science.

### **The limits of our knowledge about games**

When we think of games we might look for rules, goals, outcomes and feedback, challenge, competition or conflict, interaction, and representation or story but such a description seems overly prescriptive for the digital experiences described in the collection of papers on digital games presented in this issue. Rosemary Garris, Robert Ahlers and

James Driskell (2002) note there is little consensus on how games are defined, a sentiment shared by Wittgenstein (1953) when he made the case that while “game” might be difficult to define, that did not matter because in a specific interactional context we all successfully use the term and its associated ideas. All of the manuscripts in this collection on digital games and science learning address questions of learning in contexts that I think you will agree involve digital games, even if the construct of a digital game is not always defined explicitly, and our lives are richer for engaging with the authors of the manuscripts in this collection.

### Neo-liberalism and games

The issue is completed with a set of papers that expand the discussion of neo-liberalism and globalization anchored by Jesse Bazzul’s paper, *Neo-liberal ideology, global capitalism, and science education: engaging the question of subjectivity*. In this paper, Bazzul explores the political neo-liberal nature of the internationalization of globalization in science education. As a veteran of the “science wars” Patricia Lather reflects on what needs to be done to move the epistemology of human consciousness to focus on limits to knowledge and the “affective” turn. Taking a slightly different focus, Peter Trifonas seems to arrive at a similar place arguing that science needs to acknowledge the subjectivity at its core. Both reflect on how disciplines like science use ideologies to limit what is accepted as science.

In this complete issue, I see a synergy between some of the struggles experienced by researchers exploring the use of games in science learning and breaking out of the neo-liberal agenda in science. If we think of learning based on play and consider the forms this learning could take perhaps we can also open our thinking to creative ways of connecting digital game-based competence with learning in the disciplines while also critically exploring how disciplines seek to restrict such learning habits.

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