

Games, Learning, and Society: Building a Field

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Computer and video games have recently attracted significant attention from educators as a medium for learning. Clark's (2007) critique of the "Serious Games" movement provides a set of useful guidelines for moving that particular industry forward. This article argues for another way of framing the emerging field, as "Games, Learning, and Society." Research and theory in this field can be conceptualized in three overlapping areas: researching learning in popular gaming cultures, designing learning environments based on those principles, and reconceptualizing educational practice for an interactive age.

Introduction

Although it's still news to some, interactive digital entertainment simulations—or video games—are becoming an established medium. My own interest in educational technology comes in part from my experiences playing *Sid Meier's Pirates!* as a kid. Like most who played *Pirates!* a simulation of 16th–18th century Caribbean pirateering, I developed (among other things) a surprising depth of knowledge in an academic domain (like knowing the difference in colonial politics in 1580 compared with 1720), and maybe more importantly, an affiliation toward history that paid off in school.

As a teacher, I tried to give my students similar experiences with *Sim City* and *Civilization*, but before long, they were introducing me to new technologies—like MUDs (multi-user dungeons, the forerunners to massively multiplayer games like *World of Warcraft*),

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where they logged on after school to meet people from all over the world, thereby gaining access to people, places, and experiences far beyond what was available in Oxford, Ohio. Fifth-grade kids interacted as equals with computer programmers from the Netherlands (it was amazing to watch their spelling improve), and before long they were scripting their own sections of the game—participating in the design of a new world.

I entered graduate school hoping to study the impact of such play on cognition and the social consequences of a generation of kids growing up participating in virtual worlds. Maybe, we could even use these same techniques to make school an enlivening experience. I quickly learned that as a field, educational technology was largely unconcerned with these issues. Most of what happens with technology outside the classroom was (and still is) ignored—right at a time when popular technology and media are reshaping most every other aspect of society. Within our field, studying technology for *instruction* is what counts, and even then only within controlled circumstances, toward the efficient acquisition of researcher-defined learning outcomes.

Analyzing and suggesting changes for "Serious Games," as Clark (2007) does, continues this same positivist, neo-Taylorist course. Questions are framed in terms of how to efficiently "increase" learning (as if learning is a commodity that indeed can be "increased"). We are advised to use reliable and valid "tests" for learning (as if tests were the only method of developing valid assertions about learning). We are advised to break instruction into operationalized categories (as if games and simulations were discrete categories, ignoring that there is as much variance within games as there is between games and simulations). We are advised that studies without comparisons are "useless," which discourages us from examining relationships *across* media and disregards research traditions (ethnographic, discourse analytic, case study, design experiment, historical, critical, semiotic, and phenomenological) that are not built on a logic of direct comparisons; an approach that has long been critiqued for how it privileges certain perspectives while missing others—and also failing to explain *why* particular findings are so (Stake, 1976). Finally, we are encouraged to take a short-term view about the cost–benefit ratio of ignoring future possibilities, such as reusable game tools, engines, and libraries and savings via digital distribution.

What Are Serious Games?

In fact, "Serious Games" is not the representative majority of extant games and the learning field, but rather a strand focused on developing new markets for game producers. As such, it does not at all represent the growing work on games and learning, but rather an emerging business sector. Clark's implied critique in

this magazine that Serious Games advocates do need to think more carefully about learning, pedagogy, and assessment is well taken; as an organization, it has mostly been an industry capacity-building exercise concerned with developing non-entertainment uses for gaming technology, a legitimate and useful function, but one that does not necessarily meet academic needs.

Over the past few years, many have argued that a "field" needs to examine the properties of digital media and how they operate, how people interact with and learn with and through them, how these technologies and media are transforming social institutions, and then, finally, how they can be used to improve education (Games, Learning, & Society, 2006; Gee, 2004; Squire, 2006). Much of this work—which is not cited in this review—has been taken up by literacy scholars such as James Paul Gee (2003, 2004), media theorists such as Henry Jenkins (2006), or learning scientists (Barab, Arici, & Jackson, 2005; Steinkuehler, 2005), leaving educational technologists, much as Robert Kozma (2000) predicted seven years ago "standing on the sidelines of their own game."

The 21st century—which already includes virtual worlds that people use for learning every day—is happening. Now the question is: What do we want to do about it? Already, millions of kids are growing up just like me, learning history first through games and then through television, film, and books. The pressing questions are: How are these technologies changing how we think and interact? Are they useful for engagement in society? Who is getting access to these kinds of technologies? Can we design better ones to promote more effective education for all?

Understanding Digital Media Culture

A simple but unifying theme is that as researchers, theorists, and practitioners, we must actually engage with today's globalized information/communication society on its own terms, rather than simply sit back and argue whether or not it's a good thing that it's happening. It is difficult to ask good questions about the future of the medium and its impact on education if we haven't joined the 8.5 million people from China to Nebraska that log into *World of Warcraft*, or haven't experienced being a *Full Spectrum Warrior*, much as it is difficult for literature professors to do cutting-edge work without having read a book, or film scholars to not have seen a movie.

Most of what educational technologists have studied as games (and those referenced within this literature) are not even recognizable as contemporary video games, cautioning us against taking too seriously summative findings on a field that is only emerging. Most in this field agree that there are differences between a 30-minute 2D game about a scientific

concept and *World of Warcraft* in terms of how they function as learning environments. As computing power, input and output devices, and interconnectivity develop, we will forever be in cycles of reciprocally understanding and researching technological and social change, considering what they mean for our theories of learning and education, and then attempting to build better educational systems.

As the Nintendo generation moves up the ranks in the academy, it appears no longer debatable whether a "game studies" field will emerge, but rather, what shape it will take. The Games, Learning, and Society initiative and its associated conference has suggested one paradigm of what a program might look like, integrating:

- basic research and theory into how games and their associated spaces (such as message boards or guilds) function and their implications for theories of learning, pedagogy, and society (Gee, 2003; Hayes, 2005; Squire, 2006; Steinkuehler, 2006);
- critical analysis of games, particularly game mechanics, to understand how they function to produce meaningful learning experiences (Fields & Kafai, 2007; Kafai, 2006; Squire, 2005);
- naturalistic research examining what people do with digital media and what meanings they produce with it (Black, 2005; Steinkuehler, 2005);
- focused research (such as experimental studies) investigating how learning operates and makes claims about its pedagogical value (Steinkuehler & Duncan, 2007);
- using design based research techniques to articulate specific pedagogical models for game-based learning, such as targeted games for conceptual understanding in physics (Squire, Barnett, Higgenbotham, & Grant, 2004), epistemic games for developing 21st century skills in adolescents (Shaffer, 2005), professional role-playing games in science (Squire & Jan, 2007), open-ended sandbox games for disadvantaged kids (Squire, in press), and transactional play spaces for academic learning in middle grades (Klopfer & Begel, in press);
- researching how game tools and techniques can reflect back on educational practice, such as assessment; and
- collaborative studies between teachers and theorists, investigating the broader adoption of game-based learning practices (Halverson, 2005).

Designing Games for Learning

Synthesizing this work, there is an emerging paradigm of game-based learning predicated on theories of situated cognition. These theories argue that we learn best when engaged in goal-directed activities

in which we are meaningfully engaged and invited to take on the identities of experts (Gee, 2003; Shaffer, Squire, Halverson, & Gee, 2005). These games give us access to the ways of thinking (including knowledge, skills, values, and dispositions) of experts, and invite us to experience the world in new ways. This approach is much more specific than saying, "we are interested in any game that uses fantasy, challenge, curiosity, and control [see Malone, 1981] to produce learning." Rather, it seeks to produce a deep fluency within a semiotic domain, meaning, the ability to identify problems; think with sophisticated domain-based concepts; express oneself via oral and written language; produce meanings with a variety of texts and tools; and represent thinking within these domains in a manner that is identifiable by experts as competent. The upshot of this is that we hope that players will develop *identities* as experts within a domain.

Note, however, that this means more than saying "I felt like a scientist in that game." It means doing some of the things that scientists actually do. Building on the critique of Kirschner, Sweller, and Clark (2006), games suggest a path for retaining these integral features of learning environments based on situated learning theory, while also guiding instruction in more directed ways than traditional inquiry and project-based learning. Specifically, games employ strategies, such as differentiated roles, visualization of performance, just-in-time feedback, and seductive failure states, to *guide* learning in ways that are neither wholly open-ended nor wholly directed but a hybrid of the two—something I have called designed experiences (Squire, 2006).

To assess this kind of "fluency," we need assessments that judge how well students are identifying problems within a domain; how well they can assess good solutions; what kinds of conceptual understandings they develop; and how they communicate orally, through writing, through visual media, and through computational systems. There are emerging models, such as portfolio-based learning, that, when implemented well, can yield the kind of data one needs to make valid inferences about student achievement (Mabry, 1999). However, these programs are time and labor intensive and involve extensive supports. Games provide multiple sources of feedback in the forms of charts, graphs, displays of social networks, peer feedback, peer assessments, and so on, that might be leveraged to support learning *in situ*. As such, games themselves may be much better forms of assessment than traditional methods.

No one that I am aware of advocates separating games from the broader learning systems in which they are encompassed (Squire, 2004; Wentworth & Lewis, 1973). Going back to the research on paper-based games and simulations, the instructional strategies and

supports surrounding the game are as important as the "game play" itself. Where the field of games, learning, and society is pushing us forward is in identifying and studying how game cultures themselves work, and then designing learning systems based on these properties. For example, in my work, I've looked at learning systems and forms of cognitive apprenticeships, and then have used them to design after-school programs for kids (Squire & Steinkuehler, 2005; Squire, Giovanetto, Devane, & Durga, 2005). Black's (2005) work on fan fiction communities for second language learning is inspiring the design of second language learning programs. Steinkuehler's (2005) work examining learning through massively multiplayer games similarly serves as inspiration for the design of multiplayer environments.

One overarching finding from this research is that today's digital cultures are deeply *participatory*, using digital authoring tools and distribution networks to dramatically alter how we interact. The idea here, though, is that as learning systems, games involve mechanisms for learning, such as forms of scaffolding; and that, as researchers, we want to understand *how they work together* in producing meaningful learning rather than removing mechanisms for learning.

Researching Games, Learning, and Society

The more traditional Educational Technology paradigm described here, in contrast, involves looking for blanket statements about whether games "work," or even isolating variables (like removing teachers from the equation and seeing what happens) in an effort to come up with variables that can be universally applied. Imagine the problems with making blanket statements about "books" as an effective instructional medium, or the instructional effectiveness of "color" in educational film. As an emerging paradigm, this body of work seeks to avoid the "no-significant-differences phenomena" (remember, no-significant-differences, in most research paradigms, is a failed experiment) and seeks to use iterative research, theory building, and design to generate useful theory.

I would argue that we need mezzanine-level instructional theory—theories that seek to explain how particular game-based approaches (like sandbox games) work within particular contexts. Of course, you would want to collaborate with practitioners to implement such programs (allowing them to adapt materials as necessary), but the idea is that researchers iteratively design and research these pedagogical models as "proof" of what games can do, and then systematically design the necessary and sufficient conditions for them to work.

The bottom line here is that to simply "use games to meet the same old demands" of education may miss

the point. Going from oral to print cultures meant that extended logical arguments became possible (and later valued). Mass visual media, such as photography and film, have led to the rise of the *image* in culture, and then subsequent social changes (such as corporations or universities worried about their “image,” associations people make with them as entities). In today’s culture, “image makers” (advertisers, political spin masters) reign supreme.

Just what the mix of technologies associated with digital media will result in remains to be seen, but as the Games, Learning and Society Group (2006) argues, the shift seems to be toward understanding complex systems, and crucially, identifying leverage points within those systems where one can have potential impact. Video games, with their aesthetic emphasis on *building players’ expertise*, seem to be about developing player expertise thinking within complex systems (including social systems) so that they can achieve their goals. Whether or not this orientation toward analyzing a system and exploiting its weak points transfers into other activities is less the point. The key question here is: Do such orientations become socially valued, much the way building a lengthy coherent linear argument is or was? Not that these skills will become entirely displaced, no more than the book wiped out the need for strong oratory skills. Rather, it augmented, reshaped, and changed them.

Indeed, to frame the questions narrowly may also miss the point of today’s technology and media changes. We live in an interactive age—an age where we “inhabit” simulated worlds and engage in participatory media cultures for work and fun, but rarely to learn. Today’s digital media—most notably video games—allow us to lead civilizations, run farms, and even start real-world businesses via persistent world games. But traditional school—and the direct instruction that is advocated there—dictates that students more or less do what the teacher dictates.

Conclusion

Moving forward, we need media experts, educational technologists, literacy scholars, learning scientists, and commercial developers interacting in tackling these questions. The history of educational technology and its research—ranging from conceptual issues like the Media and Methods debate to smaller grained issues like the design of instructional messaging—has a lot to inform this current work. We need to avoid, however, over-applying aging information processing models of cognition and cookie cutter applications of textbook research methodologies. We need to acknowledge contemporary developments in Learning Sciences, employing commensurate research methodologies that help us make sense of unknown questions. For better or for worse, the parade

is moving forward. Government and industry are investing millions in investigating these questions. As educational technologists, we can choose to join those embracing more expansive views of research and pedagogy—or we can stay on the sidelines as the 21st century marches ahead. □

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