

## Changing The Game: What Happens When Video Games Enter the Classroom?

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### Introduction

Over the past few years, games have gone from social pariahs to the darlings of the media, technology, and now educational industries. E-learning educators in particular stand to learn a lot about building next-generation learning environments from games (Dalesio 2004). While online courses are usually little more than "online course notes," games offer entire worlds to explore. While educators wonder if we can create good online learning communities, game designers create virtual societies with their own cultures, languages, political systems, and economies (Kolbert 2001). So, while completion rates of e-learning courses struggle to reach 50%, gamers spend hundreds of hours mastering games, writing lengthy texts and even setting up their own virtual "universities" to teach others to lay games (Squire, in press). In short, while e-learning has a reputation for being dull and ineffective, games have developed a reputation for being fun, engaging, and immersive, recruiting deep thinking and complex problem solving (Gee 2003).

Given emerging research on how videogames and associated pedagogies work in designed settings (Shaffer this volume), it seems the important question is not *can* games be used to support learning, but *how*. The explosion of games and educational game research initiatives, conferences, books, and software, suggests that computer and video games will have some part in education, just as every other media before them have been used for learning. However, the history of educational technology also suggests that media which does *not* fit with the social organization of schooling may be abandoned (Cuban 1986). Thus, research is needed to help us build better game-based pedagogical theories while reciprocally investigating our assumptions about the social organization of schooling, if games do indeed embody principles of how people learn.

### Replaying Motivation

So what happens when we bring games into the classroom? (See [Exhibit 1](#).) The first thing that one might expect to see is *increased motivation*, as common wisdom is that playing games is at least motivating, if not educational. In fact, early research on arcade-style games supports this hypothesis, showing that games create *intrinsic motivation* through fantasy, control, challenge, curiosity, and competition (Malone 1981; Cordova and Lepper 1996). We might also hypothesize that games leverage players' natural desires to develop new skills, participate in new roles, or better understand the world from a new or "professional" perspective (c.f. Gee this volume, Shaffer this volume).

Play is undeniably a powerful, pervasive method of learning outside of schools, which most psychologists would agree is a crucial way that we test ideas, develop new skills, and participate in new social roles (Piaget 1962; Vygotsky 1978).

But bringing a commercial quality educational game into classrooms may raise as many motivational issues as it solves. Over the past two years, I have been studying educational uses of *Civilization III*, a multi-million copy selling historical simulation game (Squire, 2004). (See [Exhibit 2](#).) When I introduced *Civilization III* into curricula, I found that students were anything but immediately motivated. They frequently asked, "What's the purpose of this?" and "Why are we doing this?". Even for middle school students, it was not entirely clear how a computer game could teach them about history or geography. In part, this was because most students needed 6-7 hours of game play to even understand the most basic game concepts. (See [Exhibit 3](#).) Roughly one quarter of the students elected to withdraw from the unit, opting to participate in reading groups rather than a game-based unit. They felt that the game was too hard, complicated, and uninteresting.

Another 25% of the students or so (particularly those not good in school) loved playing the game, thought it was a "perfect" way to learn history and considered the experience a highlight of their school year. For these students, many of whom actively resisted school-mandated history curricula which they regarded as "propaganda," the game-based curriculum provided opportunities for *replaying history*, for considering hypothetical historical scenarios, such as under what conditions might have a Native American tribe held off Europeans or even colonized Europe. In post interviews, these students developed new vocabularies, better understandings of geography, and more robust concepts of world history (Squire 2004).

This example raises several issues with game-based education and motivation more generally. First, games are very particular kinds of experiences. Playing games doesn't appeal to everyone (even among those under 30), and definitely no one game (or more appropriately game *experience*) appeals to everyone. The experience of playing *Civilization III* is a cerebral blend of planning, building, managing, and competing with other civilizations. In this study, the experience appealed to students who enjoyed building and managing virtual societies, using mathematics in game play, or were interested in geography. Contrast the pleasures of *Civilization* with those of fast-paced action games or massively multiplayer games which are about rhythm and timing or participating in complex virtual societies (Bartle 1996; Steinkuehler 2004a). An important point for educators to consider and explore in future studies is how different players experience different games of different genres, and what these principles might mean for learning.

The variance in players' reactions suggests that games are not a silver bullet for education, in part because they will never appeal to all learners, but also because they alone will not likely change learners attitudes and values toward schooling. As such, motivation for these gamers was not simply a "property" or variable that they either had or did not; it emerged through the intersection of students' goals, the game's affordances, their life histories, and institutional context.

## **Difficulty, Complexity, and Failure To Learn**

Those unfamiliar with contemporary video games are shocked by their complexity and difficulty. (See [Exhibit 4](#).) Part of what makes *Civilization* so interesting is its *complexity*, *flexibility* and *replayability*. *Civilization* takes hundreds of hours to master and can be played dozens of ways; players can win through military, scientific, economic, political, or cultural superiority (and most likely a combination of each). Different games offer unique challenges, but part of what makes most any game engaging is its difficulty, the compelling challenges it provides players.

And for many students, the complexity of *Civilization III* was overwhelming and just *too* difficult. Many said that *Civilization III* was more difficult than anything they encountered in school. In packing 6000 years of history into one game, *Civilization III* includes hundreds of game concepts, ranging from its six government types (anarchy, despotism, monarchy, communism, republic and democracy), to 13 terrain types (grassland, mountains, and so on). To play *Civilization III* successfully, one must not only understand these terms, but understand the strategic significance of each (i.e. what is the comparative advantage of cities in river valleys vs. woodlands). Indeed, in any given period, students would ask literally dozens of questions, ranging from simple queries about geographical facts (e.g., Is there oil in Greenland?) to functional questions (e.g., What are the effects of democracy?) to questions about the game as a simulation (e.g., Does the game include World War I?). What is most curious is not that students found the game challenging, but that they found an off-the-shelf computer game marketed toward a broad audience and which has sold millions of copies more difficult than their learning experiences in school.

Bringing *Civilization III* to school reminds us of something that constructivist educators have already learned: Contemporary pedagogical practice, which breaks problems down into bite-size pieces that are easy-to-learn often creates a sense of "learned helplessness" in students (particularly high achieving ones) who have only seen short, solvable problems where all of the information needed is laid out in front of them (c.f. Cognition and Technology Group at Vanderbilt 1990; Schoenfeld 1987). Games, on the other hand present players complex holistic problems (Gee, this volume). The high school students described here all played games outside of school, but *Civilization's* complexity was problematic within a school setting. If part of what makes games so interesting is their ability to present access to complex professional practices, then managing this complexity (and particularly students' reactions to it in school settings) will continue to be a challenge. (See [Exhibit 5](#).)

## **Learning Through Failure**

*Failure* was not only a "problem" but a critical precondition for learning. Failure forced students to confront gaps or flaws in their current understandings through cycles of *recursive* play. As Tony explained, "Playing the game forces you to learn about the material. It actually forces you to learn about other civilizations in order to survive." For Tony, this meant understanding who other civilizations were, where they came from, and

what natural resources they had. Learning occurred through cycles of problem identification, developing causal interpretations of events, brainstorming possible solutions (possibly drawing from knowledge of history or geography), implementing solutions, examining results, and repeating.

Failure, while a time-honored notion in educational technology (c.f. Schank, Fano, Bell,

& Jona, 1994) functions somewhat uniquely in game-based learning environments. Unlike traditional traditional microworlds, where learner build a representation of a system and examine how it succeeds or fails in explaining observations, game-based learning environments *start* with failure. As learners play the game, they build a model of the game world based on experiences in the game and outside of it (i.e. expectations of how galleys will behave in the game). The rules of the system, which including 10,000s of interacting variables are incredibly complex, and it is through “bumping up against them” that players begin to learn about geography and history. This learning cycle is critical to both intellectually engaging game play and academic learning and suggests the potential for designing other educational games.

After going through these cycles of recursive play, students' thinking became more and more complex. Success (even survival) in the game required deep thinking across diverse problem spaces. They learned to see game challenges (such as building a happy civilization) as the result of more and more factors (available luxuries, entertainment, luxuries, religion, and economics). As one student summarized what he learned, "You can't separate geography from economics from politics." Learning to identify problems and then devise solutions across several domains is uncommonly found in school, but precisely the kind of skill valued among knowledge workers in the new economy (Gee, Hull, and Lankshear 1996; Reich 1990).

For other students, failure caused frustration. Whereas the stronger, more confident students saw failure as a learning opportunity, others did not. These students had insufficient interest in the game, lacked a requisite self-efficacy with games, or perhaps were just having a bad day where playing such a difficult game was unattractive. As anyone who plays *Civilization III* would attest, defeat after a good 25 hour game can be maddening, and on some days, one is just not up for the humiliation. Interestingly, failure affronted those students who self-identified as gamers, suggesting that educational games may not be such an easy win with gamers who may reject educational games out-of-hand. Further, games may be a poor fit for learners who come to school with “damaged” beliefs about learning, such as that failure is a value judgment on them as students, as opposed to the beginning of a valuable learning experience.

One of the reasons some students (including gamers) rejected the game experience in school was probably because playing *Civilization III* in a school context was *compulsory*. Advocates of game-based learning must consider if by requiring games, we loose some of the choice that makes them engaging (Malone 1981). Even if students have the choice to

play games, there are potential contradictions in situations with heavily mandated curricula. If part of what makes games so appealing and educative is that they give us meaningful choices (c.f. Zimmerman and Salen 2004), how will they fair in situations where there are very prescribed learning outcomes? Further, for many, game play for many involves *social transgression*. Games allow us to bend, or temporarily let go of social rules to try new ideas and identities. Most often, these transgressive themes reach the radar of popular culture when they involve violence, but games such as *Deus Ex*, *Balance of Power*, *Hidden Agenda*, or *Freedom Fighters* have politically subversive messages as well. Steinkuehler (2004b), argues that massively multiplayer games are so compelling precisely because they are a critique on contemporary culture. How games will fair in schools, an institution designed to reproduce existing power relations is questionable; however, minimally educators need to be careful that bringing games into schools does not rob them of precisely the qualities that make them so engaging.

### **Implications: What Game Are We Playing?**

Indeed, just as no one game appeals to all students, neither does any one curriculum, and games challenge us to ask who traditional curricula appeals to and who it leaves behind. Our traditional secondary curriculum is largely an experience of mastering a pre-defined set of objectives, mostly through listening or participating in structured activities with well-defined, pre-determined outcomes. In post-secondary schools, the activities are more open-ended, but mostly mediated through text, secondary accounts of phenomena. College students mostly listen to lectures, read texts, and if they are lucky, discuss them with peers or an instructor. Those who prefer to develop understandings through building, tinkering, or more direct experience are left behind. Not surprisingly, many of the students who performed well in the game-based unit were just those who felt disaffected from school because they preferred "hands-on" activities where they could learn through doing and "figure things out for themselves." Oddly, this is how learning occurs everywhere but school, and again, is how workers are asked to learn in the new economy.

Looking at who wins and loses through a game-based curriculum reminds us that curricular issues are also about power and control. A curriculum based on *Civilization III* overturned traditional hierarchies, supplanting those adept in traditional schooling with those failing school. The successful students were concerned that their more traditional school-based expertise was not being honored in this classroom and were not convinced that success in a game-based unit would help them on college entrance exams or in college classrooms, both of which rely on more traditional literacies. They believed that *Civilization* was insufficient preparation for the "game" of higher education, and perhaps they were correct. Yet, students who were failing in school (or who school was failing) developed and demonstrated complex understandings within a game-based curriculum that go undeveloped or unrecognized in other school experiences. Ironically, the skills required by the game curriculum—problem identification, hypothesis testing, analysis, interpretation, and strategic thinking more closely align with the new economy than does the "factory" model of curriculum, which privileges following directions, mastering pre-defined objectives, performance on highly structured tasks, and intellectual obedience (Gee, Hull, and Lankshear 1996). In short, schools are designed around factory models of

education, where the goal is to efficiently produce standardized learners and, most importantly, sort students into those groups and games are products of the new economy, where the goal is to think creatively with digital tools (Bowles and Gintis 1976; Lagemann 1989).

Educators hoping that digital games will be a "silver bullet" because they are exciting and motivating will be disappointed. The real challenge is not so much in bringing games, or any technology into our schools, but rather changing the cultures of our schools to be organized around learning, rather than the current form of social control. Of course, we already have some schools designed to give students skills they need for the new economy, but unfortunately they are in our private or highly performing suburban schools. As a former Montessori teacher, I can easily imagine students using *Civilization III* to investigate historical questions within that system, which is organized around students pursuing questions of intellectual interest. The system allows considerable freedom, so those students less interested in this particular game could pursue other activities. Indeed, games such as *Sim City* (which was designed by Will Wright, a former Montessori student himself) are already in suburban schools; witness schools like Erving Elementary in Erving Massachusetts, which has built a city planning curriculum around *Sim City*. Creative teachers in communities with ample resources and supportive parents are beginning to explore such pedagogies; it is only too bad that they are reserved for students of privilege.

As schools go online, we have tremendous opportunities for rethinking the culture of our classrooms. E-learning educators are wise to look toward games as models of next-generation learning environments. They long have been best models of engaging activity and, more recently as excellent examples of learning environments. Yet, as challenging as it is to design a good educational game, it may be more challenging to design a good educational system for an educational games to flourish in. Right now, even if you had the ideal game—a more polished *Civilization III* or perhaps a *Full Spectrum Scientist*, it is not certain that such a game could even survive in today's educational environment as our contemporary educational systems do not know how to sustain a curricular innovation built on the properties that make games compelling.

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