

What Can K-12 School Leaders Learn from Video Games and Gaming?

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Video games and gaming cultures have emerged as rivals for the attention of school-age children. Rather than learning from games, many school leaders and teachers have sought to condemn gaming and restrict the development of game-based curricula and pedagogies in schools. This paper suggests that leaders can learn from gaming by exploring how to develop curricula and establish spaces for teachers to learn and teach from gaming principles. Additionally, games are also well suited to represent how practitioners negotiate complex situations, and may provide powerful tools for leaders and researchers to learn about leadership practice.

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What can K-12 school leaders learn from video games and gaming? An understanding of video games as learning environments is becoming increasingly important as gaming culture rivals schooling for the attention of children and adolescents across the world. Given this popularity and the compelling nature of game-play, school leaders and program designers should be able to draw on games and the principles of game design to build more compelling learning environments. However, there seems to be little constructive information flow across the cultures of schooling and gaming. Many school leaders react negatively to video games and gaming culture. Video games are regarded as diversionary threats to the integrity of schooling (at best) or as destructive, compelling activities that simultaneously corrupt moral capacity and create a sedentary, motivation-destroying life-style. Apart from embracing a few games such as *Oregon Trail* or *SimCity*, schools have typically acted to control or eliminate gaming. In effect, the content and the addictive play of games such as *Doom*, *Grand Theft Auto* and *Everquest* have distracted parent groups and school leaders from the compelling nature of game design principles, refined through intensely competitive market conditions, that draw an increasingly broad range of players to gaming.

Gaming culture and game designers seem satisfied to happily exploit this institutional disdain. Schools have responded to adolescents' increased cognitive capacity and desire to explore identities by imposing more rules and decreasing the complexity of cognitive tasks assigned, creating a mismatch between adolescents' developmental stage and the school learning environment (Eccles et al. 1993). Games address this mismatch by providing increasingly complex, customizable learning-by-doing environments. Just as schools are moving toward increasingly standardizing the learning experience, games offer the prospect of user-defined worlds in which players try out (and get feedback on) their own assumptions, strategies and identities. Thus games have come to typify the essentially subversive nature of computing in relation to schools (Squires 1999). Jim Gee (2003) argues, however, that the compelling nature of video game participation is in part due to the underlying social, cognitive and developmental learning principles around which successful games are built. With this perspective, games and gaming can be a source for inspiration in building school-based learning environments.

By "gaming" here, I am referring to endogenous, rather than exogenous games (Malone and Lepper 1987). Teachers and curriculum designers have long used exogenous games, such as *Jeopardy-* or *Wheel of Fortune*-style quizzes, in order to provide a review of or a break from ordinary learning activities. These games are popular in schools and relatively easy to create, but are not intrinsically related to the learning content. In contrast, endogenous games, such as *SimCity* or *Full Spectrum Warrior*, seek to simulate relevant practices of the target environment in the structure of the game. Learning to navigate the game architecture provides a way to understand how knowledge is organized in the disciplinary domain. Thus endogenous games are themselves both the learning content and the learning environment. While exogenous games are valuable tools in the teaching repertoire, formal schooling has shied away from the adoption of endogenous games. This paper will explore what school leaders can learn from the design and experience of endogenous video games.

Leadership for gaming; Gaming for leadership

So what can school leaders learn from video gaming? While individual teachers may embrace gaming in classrooms, it falls to local and district school leaders to create the conditions for widespread use. Principals, technology and curriculum coordinators, superintendents and

department chairs are all responsible for integrating technology and sponsoring new instructional practices in schools. These leaders must coordinate their efforts in order for gaming to get a foothold in the practices of teaching and learning. I suggest organizing what leaders can learn from gaming into two separate but related categories: *leadership for gaming* and *gaming for leadership*.

Leadership for Gaming

Leadership for gaming addresses how leaders can integrate existing games into schools and can use the principles of game-based pedagogies to design learning environments. The first step requires superintendents and public spokespersons for schools to move beyond the anti-game rhetoric and to consider the range of learning opportunities presented by video games.

- Games such as *Rise of Nations* and *Civilization III*, for example, provide rich, interactive environments to explore counterfactual historical claims and help students understand the operation of complex historical modeling. Squire and Barab (2004) show how students who traditionally struggle in school can use *Civilization III* to examine, for example, what would happen if Africa (instead of Europe) had colonized North America. The ability to play out alternative histories, while often frustrating for teachers and students, can open new possibilities to make history come alive for disenfranchised or uninterested students.
- Many design-based games also provide constructionist learning opportunities for students to represent their understanding by building models and simulations (Kafai 2001). Games such as *Railroad Tycoon*, for example, allow students to engage in design activities that draw on the same issues of resource allocation and terrain navigation faced by the original rail designers.
- The emergence of on-line gaming calls the stereotype of the isolated game-player into question. The social dimension of games such as the *Sims*, *Lineage* and *Fantasy Sports* allows players to participate in a wide variety of social worlds and to try on alternate identities (Steinkuehler 2004). These venues for social experimentation provide interesting occasions for students to engage in the developmental identity tasks of adolescence (Gee 2003; Kroger 1996).

Recognizing how games such as these provide powerful learning opportunities should go a long way toward shifting the current anti-gaming rhetoric.

Second, school leaders can rely on research on simulations to guide the integration of games into relevant learning environments. Simulations provide structured opportunities for learners to engage with artificial worlds for the purpose of making predictions and/or engaging in consequence-free interaction (Prensky 2001). They have provided efficient and safe learning opportunities for medical, architectural, business and scientific students; and activity-based simulations such as mock trials, the *Model United Nations*, or lab experiments have always been a staple of the school instructional program. Researchers have found that some standardized learning objectives, such as systems thinking, geology, immigration or global warming, may be more effectively taught with technology-based simulations than with typical classroom-based lessons (see for example, Radinsky, Ryan and Buelow under review; Edelson, Gordin and Pea 1999; Kafai 1995; Krajcik 2002).

Learning in these computer-based simulations benefits from having students interact with dynamic, virtual representations of content, but such simulations are not necessarily engaging. It is the nature of the activities that take place within the simulation that create engagement. Integrating game features such as compelling goals, user-defined paths, and action-linked consequences make simulations more compelling (Prensky 2000). Goal-based scenario design, for example, suggests that enhancing simulations with player-level goals and opportunities to learn from failure create an authentic, engaging learning environment (Schank 1992). Games such as *Supercharged* and *Revolution* show how to integrate player experimentation and strategizing into the study of electricity and historical causation and change (Holland, Jenkins and Squire 2003; <http://www.educationarcade.org/>).

Third, school leaders can establish spaces for teachers and curriculum designers to develop game-based learning environments. While traditional standards-based school learning environments are focused on content coverage, game-based pedagogies require designers to think of content as experienced by the player rather than as presented by the designer. This game-based pedagogy is consistent with current learning sciences research on the dimensions of successful learning environments (Bransford, Brown and Cocking 1999):

- *Learner-centered environments* draw on the interests and motivation of students to develop their own learning paths. Good games provide learner-centered environments by organizing learning content in terms of what and when students need to know it.
- *Assessment-centered environments* integrate formative learning measures and user activity. Good games do the same by providing opportunities for risk-taking and controlled failure in which player actions are directly linked to consequences. The short jump from cause to consequence provides players with the formative information necessary to reassess initial assumptions and act in new ways.
- *Knowledge-centered environments* organize knowledge for appropriate use by learners. Organizing knowledge in terms of learners would require school leaders to reconsider current disciplinary distinctions by integrating multidisciplinary content into game-like curricula. For example, developing a game-based approach to immigration policy might require a student to know the history and consequences of past immigration policies, the statistical tools to detect patterns and analyze trends, and the ethnographic perspectives on what life is like for new immigrants. The central challenge for curriculum designers, then, is to create a coherent (and comprehensive) learning experience scaffolded by a variety of visualization and analytic technologies.
- *Community-centered environments* demonstrate how learning needs to be situated in meaningful social contexts. Video games engage players in several forms of community. The social activity in on-line video games includes virtually mediated synchronous interaction with other players within games and asynchronous participation in gaming forums. Moreover, many players explore gaming interests with friends off-line through conversation and reading game-related materials. The social context of gaming expands the spatial limitations of the classroom environment by allowing students to learn through participating in *affinity groups* (Gee 2003) as well as institutionally selected peer groups.

Drawing on these principles of successful learning environments will guide school leaders and curriculum designers in situating game-based pedagogies in traditional school contexts.

Ultimately “leadership for gaming” rests on the ability of teachers and leaders to learn from the new practices and habits of students. Adolescents are not only a prime market for video gaming, they are also among the leaders in game development and innovation. Incorporating video gaming into schools would mean taking seriously the adolescent experience with gaming and understanding how it could further, rather than hinder, the interests of teaching and learning.

Gaming for Leadership

Another perspective on the role of gaming and schools indicates that game-based simulations could enhance the administrative and managerial abilities of school leaders. Gee (this issue) suggests that any attempt to build a game-based learning environment would have to “pick its domain of authentic professionalism well, intelligently select the skills and knowledge to be distributed, build in a related value system as integral to game play, and give explicit instruction only ‘just in time’ or ‘on demand.’” David Shaffer’s (2004) research on professional *praxis* demonstrates how to pick domains of authentic professionalism by using the structures that professions such as architecture and urban planning develop to organize the knowledge in a discipline. Documenting and representing these structures in complex simulations allows learners to access and use the *epistemic frames* that guide professional practice (Shaffer this issue). Once uncovered, these epistemic frames can serve as design principles for praxis-based learning environments.

Game-based simulations have long been familiar in training programs, but recent advances in both computer-based gaming and the description of professional knowledge could open up new areas for development. Games such as *School Tycoon* and *Virtual U* allow players to practice generic management skills when experimenting with the infrastructural, financial and personnel systems in K-12 and post-secondary schools. Gordon’s (2004) outcome-driven simulation models show how analyzing novice and expert responses to the typical problems of practice can be used to structure game-like interaction through branching narratives. My own work (2002; [2003](#)) argues that the expertise of school leaders resides in the ability to “set” solvable problems in authentic, complex situations. Developing this grounded ability to successfully frame problems in complex systems is problematic in traditional leadership preparation programs. Communicating this “practical wisdom” requires building careful representations of the context of leadership practice, then investigating how to make these representations engaging for new learners. I have contributed (Halverson and Rah forthcoming) to the initial stage of this work by developing a multimedia representation of a principal’s effort to restructure learning opportunities for struggling students. The next step in this research is to integrate game-like principles in a simulation that brings the processes of school leadership alive for learners.

Developing such a school leadership game requires designers to carefully document epistemic frames as organizing principles for game development. Designers must uncover and represent the tacit knowledge of how practitioners successfully engage in complex, discretionary practices. Designing and sharing game-based representations can then be used as occasions for reflections on practice, sparking players to explore their tacit understandings of system interaction and react to the accuracy of the system representation (Halverson et al. [2004](#)). Thus building games about leadership practice may itself be a powerful research strategy for understanding leadership.

Conclusion

Although many teachers and school leaders use computers for peripheral activities like communication, record keeping, and lesson planning (Cuban, 2001), their impact on the core practices of teaching and learning has yet to be realized in any significant way. This state of affairs is ironic. The game generation, our students, is at the forefront of a wave of computerized innovation that the leaders of the educational establishment resist, even as they are pressured to use technology to improve classroom instruction. In light of this situation, consider the advice of Resnick and Perret-Clermont:

Young people must clearly want something that the formal institutions of which they are a part cannot, or at least do not, provide. What is that something? Could mainstream institutions do a better job of providing it? Perhaps they could, but only if those in charge are able and willing to examine the alternatives closely and to consider the possibilities of new forms of organization that are better suited to an era in which the ideas and information flow without apparent control and in which the boundaries between youth and adulthood are far less clear than formerly (2004, 13).

School leaders can take the initial steps in this direction simply by recognizing the instructional possibilities of games and by considering how to incorporate gaming principles in the design of advanced learning systems that engage the students who traditionally struggle in schools and accelerate the performance of all others. If leaders can then acquire a greater range of experience with games as learning tools and actually develop learning environments that support game-based pedagogies, we may see the start of a world in which schooling and gaming work together to define the future of education.

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