



Why Videogames are Cool & School Sucks!

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Abstract

This workshop outlines the relationship between videogames and contemporary views of learning, with the aim of informing educators and game developers alike, thereby strengthening bonds between the game industry and academia. In particular it illustrates why academics are beginning to recognize and understand the potential of games as a means for promoting learning. Ideas such as games as “cognitive artifacts” or “objects to think with”, notions of “thought as play” and “hard fun”, and the role of design and representation are discussed. The workshop then focuses on identifying those aspects of game design and gameplay that are understood to promote learning. Clearly, due to the nature and scope of the issues raised, the workshop serves as a means for further discussion and research rather than as a comprehensive account of all the various topics.

Why School Sucks!

Ask the typical student for reasons as to “*Why School Sucks!*” and you could probably fill a library many times over. Some of us might even offer some of our own anecdotal evidence. However, by adopting this (controversial) student viewpoint, we are not attempting to attack the value of education nor suggest that it is a universally held viewpoint. Rather, “*why school sucks*” is intended symbolize the need to critically evaluate the traditional (or stereotypical) model of formally institutionalised systems of education, especially in light of the potential for contemporary educational technology to transform education.

Think of school and you most probably think of classrooms, subjects, teachers and their teaching. You sit in a classroom and the *teacher teaches you*. The primary focus is on *teachers* and the *practice of teaching*. Furthermore, the emphasis is on presenting a certain amount of sequenced content - the curriculum - typically through chalk-and-talk sessions. Teaching, and for the most part school education, is something that is done *to you*. Teachers typically bundle the content into a long series of words, dates, numbers or equations, and send them into the void of the classroom, hoping they will magically be received and understood by the students. And if the students don't seem to understand, then it's more words and equations, only louder. It's easy to see then that within traditional schooling, teachers play the active role in the teaching-learning process, and many students are left as passive receivers¹; any learning that does occur is a by-product. No wonder kids say school is boring!

Another reason “*Why School Sucks!*” comes in the form of pop quizzes, tests, exams, and homework exercises – just about any activity that can be graded. You know, there are teachers who believe that “learners will work for grades much in the same way that employees work for pay” (Tobin &

¹ Academics term this approach “*instructionist education*, [where] a learner is asked to learn what the instructor thinks [s]he should learn” (Gargarian, 1996, p. 149), and is “exemplified by the traditional lecture where the lecturer talks and the students listen” (Birkbeck College Central Computing Services, 2003).

Tippins, 1990, p. 12). Furthermore, “reward and punishment [serve] as key motivating factors” (Bohm & Peat, 1987, p. 232) within the school system. So in order to be rewarded for your efforts, you need to become a type of automaton and always stay on-task within the allocated time period. Then, and only then, will you receive a grade – either a number or letter, and possibly a red elephant stamp, as a reward for all your hard labour. Do something considered off-task, or get a “wrong answer”, and you might be lucky to get a grade, otherwise it’s an after-school detention.

Many school educators tend to hold the traditional view that the results of tests give an almost perfect reflection of what you’ve learnt, your level of competency, and how much of it you’ve understood². That’s why school can seem like an endless array of multiple-choice tests, exams, and pop-quizzes. The school system needs a quick and easy way of assessing students’ understanding, and there’s probably nothing quicker than grading a “fill-in-the-gaps” or “circle-the-correct-answer” test or quiz. With so much emphasis on *producing answers* as a means for assessing learning, little attention is given to the *learning process*. The tasks at school sometimes appear irrelevant to the context of the “real world”, and that’s because they typically are. They exist within the curriculum because they are quick and easy to set up, perform and grade, rather than because the kids will become enlightened or empowered or will have learnt anything meaningful after completing them. The focus here is on answers rather than ideas, grades rather than creativity, boring tasks rather than fun, work rather than play.

As a consequence, within our schools “kids aren’t learning how to think anymore – they’re learning how to memorize” (Gee, 2003a, p. 1). School becomes a never-ending test of a student’s skill at ‘verbatim regurgitation’ – read it, then memorize it and ‘barf it up’ on your exam paper.

So to summarize, “*School Sucks!*”, because it is, for many students, boring and seemingly pointless. It’s boring because in class you sit there while the teacher tells you stuff you’re expected to remember. And when they do provide you with an opportunity to participate in an activity, it’s often a meaningless and boring individual task that’s been designed to be quick and easy to grade rather than one that is meaningful, engaging and challenging. It seems that everything comes down to getting the right answer. School sucks because it’s about an apparently never-ending series of homework, tests and grades; it’s about reward and punishment – probably more of the latter. Ask someone for help, and that’s it, you’ve been caught cheating so it’s off to detention. School sucks because it’s about the school having the control and the kids having almost none. And school sucks because it’s about work, not play.

Why Videogames are Cool

Now erase from your mind thoughts of school and think... videogames³. There’s probably just as many, if not more, reasons as to why videogames are cool than there are as to why school sucks.

One way in which videogames are “cool” is because players are constantly challenged in interactive, visual - often three-dimensional, immersive environments. And “[p]layer activity is arguably at the heart of the video game experience” (Wolf & Perron, 2003, p. 15). Unlike school, videogames

² Shepard (2000) explains how there is a prevailing view among schools of “tests [being] isomorphic with learning” (p. 5).

³ In this paper the term ‘videogame’ encompasses electronic games played in arcades and on consoles such as the Sony *PlayStation 2*, Microsoft *Xbox*, Nintendo *GameCube* and Sega *Dreamcast*, in addition those games played on computers.

empower the player, giving them control within the game world. Game designers ensure that there's "[a] constant focus on the player experience", explains game designer Noah Falstein in Prensky (2001, p. 134). And it's the game's *gameplay* that provides that experience.

[a] game's gameplay [is] the degree and nature of the interactivity that the game includes, i.e., how the player is able to interact with the game-world and how that game-world reacts to the choices the player makes. (Rouse, 2001, p. xviii)

The very element of gameplay "encourages the player to employ strategy... [as] all well-designed games, from *Tetris* to *Quake*, require the development of strategies to play them effectively" (Rollings & Morris, 2000, p. 24). Little wonder, then, that Australian gamers rate '*challenge*' then '*skill*' as the top reasons for their "attraction to and experience of video and computer games" (Durkin & Aisbett, 1999, p. 71). Videogames are designed to be challenging, they're meant to entertain players by making them think. Game designers offered the following when asked about what makes a good game:

Entertain the player by engaging the mind.

- game designer Bruce Shelley of Ensemble Studios. (Shelley, 2001)

Keep the gameplay challenging, but don't let players get lost or blame the game for their problems. A good game designer always knows what the player is thinking and looking over their shoulder every step of the way.

- game designer David Perry of Shiny Entertainment in Saltzman (1999, p. 24)

A game is a series of interesting choices.

- game designer Sid Meier of Firaxis Games in Rollings & Morris (2000, p. 38)

Provide the player with interesting decisions, not trivial or random ones.

This is the essence of gameplay.

- game designer Bruce Shelley of Ensemble Studios in Prensky (2001, p. 133)

Easy to learn, hard to master. The best games are often the ones that can be learned in only a few minutes, but provide hours or even lifetimes of challenge.

- game designer Noah Falstein in Prensky (2001, p. 135)

It's ironic that while many schools are complaining that students aren't meeting test requirements and teachers have problems engaging them, kids "sometimes think about games in class... how to work out the problems and the strategies" (Durkin & Aisbett, 1999, p. 71). By playing games kids are developing strategic thinking, developing "simpler solutions to harder questions" (Durkin & Aisbett, 1999, p. 71) and recognizing that "[t]here's more than one way to solve problems" (p. 72). They are being confronted with challenges requiring them to make interesting decisions, unlike school, which is seemingly filled with, often pointless, boring exercises and where the hardest decision is choosing one answer from five.

Another reason for videogames being cool is that the game designers make them “highly adaptive. . . [as] the game must be fun for a variety of players” (Falstein in Prensky (2001, p. 135). While schools are going “back-to-basics” and handing out more and more standardized tests, game designers are finding new ways of adapting to the player’s skill level to provide constant challenge throughout the game. An example of how game designers make games adaptive is by having “a series of levels of increasing difficulty, so experts can find their challenge later on in the game, while novices are challenged at the beginning” (Prensky, 2001, p. 135). Another is for players to set their own “user-controlled “difficulty level” or “cheat codes”” (Prensky, 2001, p. 135).

Videogames also “[e]mphasize exploration and discovery” (Falstein, 2003). Players are expected to spend time exploring the game-world. They’re expected to work out relationships between things for themselves. Players are expected to come to dead-ends and make wrong turns. In short, players are expected to make what school calls ‘mistakes’ which often result in bad grades.

And while on the subject of rewards and punishments, game designers recognize that well designed games “[d]on’t penalize the player” (Falstein, 2003) and should provide the player “frequent rewards, not penalties” (Falstein in Prensky (2001, p. 135)); rewards such as completing a level, or having “small rewards, such as things to find and collect, along the way” (Falstein in Prensky (2001, p. 135)). Playing games, after all, is meant to be an enjoyable and rewarding (pun intended) experience.

Videogames provide players with a “motivated activity [that is] challenging and rewarding” [where the player’s] mind is captured [and] the experience is exhilarating” (Norman, 1993, p. 31). This type of “optimal experience, or *flow*” (Csikszentmihalyi, 1988, p. 24), is an optimal state of enjoyment where players are completely absorbed with playing the game – “a continual flow of focussed concentration” (Norman, 1993, p. 31). It’s an almost trance-like state in which the player is completely focussed on playing the game, and everything else seems to fade away. A study of Australian gamers illustrated their flow experiences:

If someone asks me a question [while playing a game], I’ll only vaguely hear it and I’ll say ‘oh yeah’ or anything I can think of and keep playing. (Durkin & Aisbett, 1999, p. 60)

You’re actually focussed on what you’re doing. People have to call you a couple of times before you register that something’s happening. My mum said she was yelling at me for five minutes but I couldn’t hear her. (Durkin & Aisbett, 1999, p. 60)

In order “[t]o remain in flow, one must increase the complexity of the activity by developing new skills and taking on new challenges” (Csikszentmihalyi, 1988, p. 30). One way game designers achieve this is by making games adaptive. And while there is the potential for flow states to be achieved in school, the unchallenging nature of the traditional approach toward education is, for many students, a major limitation.

But beyond all else, the number one reason why videogames are cool is that they’re *fun*!

Making games “fun” is our only objective, and we are always making an effort to accomplish this goal.

- game designer Shigeru Miyamoto of Nintendo in Saltzman (1999, p. 85)

The first and foremost question to be answered about any game, whether it's a shooter or whatever is "Is it fun?"

- game designer *The Levelord* (Richard Bailey Gray) from *Ritual Entertainment in Saltzman* (1999, p. 124)

Rule Number One isn't "Make sure it's a game". It's "Make sure it's fun!"

- game designers Andrew Rollings and Dave Morris in *Rollings & Morris* (2000, p. 21)

Games are fun because they provide a source of “*enjoyment and pleasure*” (Prensky, 2001, p. 108). The fun resides in the *process of playing* them – solving puzzles, overcoming challenges, gaining rewards, achieving goals and so on. Now think of the kinds of activities that are dished out to kids in traditional schools; no wonder they find it boring.

So in summary, videogames are cool because they focus on the player – they require activity on the part of the player. They are designed to entertain by engaging the minds of those who play them. Players solve problems and develop strategies when playing videogames. Moreover, these challenges cater to players with differing skill levels, highlighting how games are highly adaptive. Videogames emphasize exploration and discovery, and are designed to reward, not penalize, the player. They also provide players with a source of optimal experience, or flow, in which they enjoy a state of intense focus and continual concentration. Finally, videogames are cool because they are designed to be fun!

Games & Learning

If videogames are so cool and school sucks, then what do games have to do with learning? Well when we speak of learning we're not talking about school teaching based on the idea that knowledge can simply be transmitted from teacher to student (remember, that's one of the reasons why school sucks). Rather, we're speaking of learning where the student takes active control of the learning process. Arguably one of the greatest minds of the 20th century, Albert Einstein is quoted as saying “I never try to teach my students anything. I only try to create an environment in which they can learn.” Einstein in Prensky (2001, p. 71).

Kids learn by actively *doing*, in particular, they *learn by making*. Learners must take control of the process and actively build their own knowledge. In short “[c]hildren don't *get* ideas; they *make* ideas” (Kafai & Resnick, 1996, p. 1). In addition, they are “more likely to make new ideas when they are engaged in making some type of external artifact [or object]” (Kafai & Resnick, 1996, p. 1) that is personally meaningful to them. This is the idea of “learning through design”⁴ (Kafai & Resnick, 1996, p. 1) in which “children can be engaged in meaningful learning activities” (Kafai, 1995, p. 10) by creating “cognitive artifacts” (Norman, 1993, p. 2), or “objects-to-think-with” (Papert, 1980, p. 11). And when players play games they're doing just that⁵.

⁴ For those with an affinity toward *'isms'*, the idea of “building knowledge by making objects” is called *'Constructionism'* (e.g., see Harel & Papert (1991) and Kafai & Resnick (1996)), and is both a theory and strategy for education.

⁵ We recognize here that quizzes, even multiple choice ones, can be fun. However, they tend not to promote the same level of deep understanding offered by games which engage players in a meaningful way by requiring them to make, or shape (i.e., design) something.

Players invest in the game by building something or shaping a character. They put a personal stamp on the game by building, possessing, moulding, defending and operating their creations. Players get a chance to be designers. (Shelley, 2001)

Games are designed to entertain by engaging the player's mind. Some kids describe playing games as "hard fun" – and they don't mean that it's fun in spite of being hard... [t]hey mean its fun because it's hard" (Papert, 1998, p. 87). The idea of "hard fun" is one of "intense concentration coupled with passion" (Kafai, 1995, p. 290); a flow experience.

The very essence of a game is *play* – playing with objects, ideas, relationships and strategies. It's about thinking critically and creatively. Some academics suggest that "[p]lay... is the very essence of thought"⁶ (Bohm & Peat, 1987, p. 48). Consequently, those in education are beginning to take notice of play as being a serious means of learning⁷.

Although their focus is to entertain rather than educate, videogame designers, since the advent of *Atari* in the early 1970s, seem to have a deep understanding of the relationship between games and learning.

I felt that the technology that we were developing was going to fundamentally revolutionize education. Because I felt that it was such a powerful and inexpensive communication medium that, applied to the job of learning... there could really be some powerful strides. I still believe that... (Atari Founder, Nolan Bushnell in 'Atari Anniversary Edition Redux' (Atari Interactive, 2001))

Games are...the most ancient and time-honored vehicle for education. They are the original educational technology, the natural one, having received the approval of natural selection. In light of this, the question, "Can games have educational value?" becomes absurd. It is not games but schools that are the newfangled notion, the untested fad, the violator of tradition. Game-playing is a vital educational function for any creature capable of learning... I claim that the fundamental motivation for all game-playing is to learn. (Game Designer Chris Crawford in Crawford (1982, pp. 16-17))

Those involved in the field of education are now beginning to discover what the game designers have known from the outset.

[Although] [t]he phenomenon of the videogame as an agent of mental training is largely unstudied; more often, games are denigrated for being violent or they're just plain ignored. They shouldn't be. Young gamers today aren't training to be gun-toting carjackers. They're learning how to learn. (Gee, 2003a)

⁶ The academics who suggested this notion of "thought as play" (Bohm & Peat, 1987, p. 48) are physicists David Bohm, one of Albert Einstein's students, and David Peat.

Implications for School Education

With a view that “[m]any people who don’t play video games, especially older people, [who] say playing video games is “a waste of time” (Gee, 2003b, p. 19), there is still some way to go before games become an integral part of learning at school. However, some of the more progressive academics do recognize that videogames, typically a form of informal, out-of-school learning, “can be applied inside of formal education as well” (Norman, 2001, p. 6).

Think of what it takes to learn a game compared to what has to be done in school. To play a game well requires the same kinds of learning, study, understanding, and practice as are required of any educational activity. There is no reason why the learning and studying required in education should not be as captivating and enjoyable as learning and studying the game. (Norman, 1993, p. 32)

Thus it is important that school educators come to realize that the focus of games is on *learning* and not on *teaching*. Implementing games in schools as an educational technology is not introducing games that are meant to teach. Rather, it’s about kids *learning by playing* videogames, and not trying to make and implement *games that teach*.

And when it comes to learning “game designers have a better take on the nature of learning than curriculum designers” (Papert, 1998, p. 87). Videogames are a business that depends on the success of the people being able to learn in order to master the game. Quite simply “[i]f their public failed to learn, they would go out of business” (Papert, 1998, p. 87). That’s how videogames became so successful at promoting meaningful learning.

The benefit of videogames for school education is not just in playing them but also in making them⁸. This is an extension of the idea of “learning through design”. Now, we’re not suggesting that secondary schools should try to compete with commercial game studios and churn out the next *Doom* or *Civilization*. Rather, by making simplistic games, students can be provided with opportunities to create and represent environments, situations and phenomena. For example, in creating an *Asteroids* type game, students have opportunities to model, or represent, then “play with” Newton’s laws of motion⁹, something that “could play a valuable role in the learning of physics” (White, 1984, p. 98).

Universities are starting to embrace game design as a means of learning. For example, the Massachusetts Institute of Technology (MIT) has joined forces with Microsoft for its *Games-to-Teach Project* (MIT Comparative Media Studies & Microsoft Corporation, 2001), and just recently *The Education Arcade* (MIT Comparative Media Studies & University of Wisconsin-Madison School of Education, 2003) was launched. By developing, and playing, with their own representations learners have the ability to gain a deeper understanding of the phenomenon, environment or concept that they’re modelling.

⁷ An example of educationalists serious considering play as a means for learning can be found in Rieber (1996).

⁸ An exemplary study of game design as a context for children’s learning can be found in Kafai (1995).

⁹ An example of kids creating a rocket type game as a means for understanding Newton’s laws can be found in White (1984).

As a final point, we would like to be clear that although we are strong advocates for learning with videogames, we are not suggesting that they are a universal solution to the problems within the school system. People learn in different ways. We're not saying that rote memorization as a means of learning is 'bad'. Rather, there is an issue of balance that needs to be addressed. Education should be more about learning than about teaching. It should be about empowering kids, and getting them to think critically. It should be about being engaged in meaningful and challenging experiences. Learning shouldn't be reduced to the mere act of memorizing stuff in order to obtain a grade between "A" and "F".

Implications for Game Education

Game Education is where "school" and "games" intersect. Students that attend *game schools* are in the unique situation of going to school to learn about game development while *designing* and *playing* games.

Probably the greatest implication for game education of the idea of games being "objects-to-think-with", is the need for game educators to develop an awareness of "learning through design", and an understanding that the design process is a learning process. When making games student developers are engaged in creating, sharing, and playing with various representations that are promoting their understanding. They are, in effect, playing with ideas. Ideas related to the art and science of game development, plus ideas from other areas such as physics, mathematics, history and even genetics.

Implications for Game Developers

The idea that videogames are becoming understood as a means for meaningful learning also has implications for the game developer community. Like for game educators, the main issue for game developers is simply one of awareness. An awareness "of the kind of contribution their work is making to the learning environment" (Papert, 1998, p. 87) as there is the suggestion that "most of us [game developers] think of games solely as a form of entertainment... [b]ut they are also a form of education" (DeLoura, 2001). It's only recently that those involved in education are beginning to realize the learning potential from playing videogames; something that the game designers have known, often implicitly, for years.

Another implication is that "games as a media form are serving to disseminate information, knowledge, and critical thinking" (Sawyer, 2003, p. 72). Universities are become better versed at the implementation of games to promote learning within their institutions. One such example is the *Virtual-U* project (Chan & Enlight Software, 2003) – "a college administration simulation developed by Trevor Chan and Enlight Software for the Alfred P. Sloan foundation" (Sawyer, 2003, p. 72).

And since the publication of Marc Prensky's influential book "*Digital Game-Based Learning*" in 2001, "the lucrative corporate market, once stung by poor e-learning offerings... is beginning to wake up" (Sawyer, 2003, p. 72). With companies such as Shell Oil spending somewhere in the vicinity of "a billion dollars a year in training and corporate learning" (Falstein in Sawyer (2003, p. 72), there is plenty of opportunity for game developers to cash in.

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