

# Educational Value of Videogames

## Education Today Continues to Evolve

Eli Neiburger is the Technology Manager at the Ann Arbor District Library in Michigan. He asserts in an article he wrote for *School Library Journal* in 2007, that literacy has evolved beyond the definition of the ability to read and write, and isn't just about print anymore. Literacy now includes the ability to seamlessly interpret on-screen information, such as the graphics in a videogame, and the ability to rapidly decode symbols. To be effective, gamers must be able to quickly decipher each game's symbols and conventions, which is essentially what good readers have to do in terms of deciphering the alphabetic code.<sup>1</sup> James Paul Gee, UW-Madison, says that learning is no longer about memorizing isolated facts, but about connecting and manipulating them.<sup>2</sup>

Constance Steinkuehler is an assistant professor of educational communications and technology in UW-Madison's Department of Curriculum and Instruction. She thinks games are changing the way people think, learn, and interact. She studies the implications of these changes for society. She feels the fast growing use and increasing sophistication of computers and other digital technologies and games, and other emerging media, are profoundly changing society. Steinkuehler, together with Kurt Squire, asserts that videogames are not replacing literacy activities, they ARE literacy activities. Steinkuehler believes what is going on in videogaming play spaces in terms of learning is ten years ahead of what is happening in education.<sup>3</sup>

An article in the *New York Times* summarized the ongoing debate about reading in the digital age. Some educators see computer games, the Internet, and other electronic communication devices as the enemy of reading. Others say that students today need new types of reading skills and schools need to pay attention to the changes in society brought about by electronic access to information because the jobs of tomorrow are going to require a different set of reading abilities. Some educators feel the mixing of words, pictures, and video and audio clips confuses students. Others feel that students should be formally evaluated on their web skills and proficiency at finding information on the Internet. Even educators who are most concerned about preserving book reading and value it over reading on the Internet acknowledge that students need a range of reading skills and need to be able to access information in a wide range of formats.<sup>4</sup>

The article quotes Dana Gioia, National Education Association, who said that she sees no evidence that increased Web activity improves reading achievement. She feels students are losing sustained, focused, linear attention developed by reading books. However, Elizabeth Birr Moje, University of Michigan, countered that literacy specialists are just beginning to investigate how reading on the Internet affects reading skills. She cited a recent study of 10<sup>th</sup> graders in Detroit that found students read more on the Web than in any other medium, although they also read books. The only kind of reading that related to academic performance was frequent novel reading, which predicted better grades in English class and higher overall grade point averages.

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<sup>1</sup>Neiburger, Eli. "Games...in the Library?" *School Library Journal*. Jul. 2007. 53.7.

<sup>2</sup>Gee, James P, Halverson, Richard, Shaffer, David Williamson, and Squire, Kurt R. *Videogames and the Future of Learning*. Wisconsin Center for Education Research, School of Education, University of Wisconsin-Madison. 2005.

<sup>3</sup>School of Education. "Serious about the Games We Play." University of Wisconsin. Jun. 12, 2008

<sup>4</sup>Rich, Motoko. "Literacy Debate: Online, R U Really Reading?" *New York Times*. Jul. 17, 2008.

However Birr Moje points out that students are developing new reading skills that are neither taught nor evaluated in school.

One early study by Linda A. Jackson, Michigan State University, was mentioned in the *New York Times* article. The study showed that giving home Internet access to low-income students appeared to improve standardized reading test scores and school grades. Once they were on the Internet, they were reading.

In a 2007 article for *School Library Journal*, Kit Ward-Crixell asserted that educational practices need to recognize today's participatory culture and to find different ways of delivering content. Today's new cultural competencies include the ability to navigate across different kinds of media and to "mashup" the various media content. Ward-Crixell feels games are the ideal model for combining content in different ways and incorporating problem solving. He sees a need for educators need to see games as an alternate learning system.<sup>5</sup>

The Federation of American Scientists hosted a 2006 "Summit on Educational Games: Harnessing the Power of Videogames for Learning." One of the findings was that today's educational model place a great deal of emphasis on the concept of "scaffolding," which involves providing learners with cues, hints, and partial solutions to help them learn new concepts. Videogames use the scaffolding concept extensively and thus have numerous educational applications.<sup>6</sup>

Steve Johnson asserts in his book, *Everything Bad Is Good for You*, that reading in books is not necessarily superior to the reading students do when they play videogames, although he says that not all games are equal in this regard.<sup>7</sup>

### **Today's Students are Different**

In a 2007 online article, Annetta Len stated that children today operate differently than they did ten years ago. Outside of school, students are multi-tasking with the use of technologies such as instant messaging, cell phones, computers, e-mail, digital music devices, and videogames.<sup>8</sup> According to a report done in 2005 by the Henry J. Kaiser Family Foundation, multi-tasking is a growing phenomenon among children and teens.<sup>9</sup> Youth now spend more time with digital media than they do watching television.<sup>10</sup> Students who have grown up with interactive digital technologies integrate them seamlessly in their daily lives.<sup>11</sup>

Yet these same students who are so thoroughly connected to technology outside of school are largely disconnected within their classrooms. Students increasingly express frustration and dissatisfaction with their school experience, and the limited access they have to the Internet during the school day. These digital savvy students want learning experiences that parallel the exciting and engaging digital formats which they use in other parts of their lives. Most instruction in schools remains rooted in the "tell and test" format which assigns a passive role to

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<sup>5</sup>Ward-Crixell, Kit. "Gaming Advocacy." *School Library Journal*. Sept. 2007. 53:9.

<sup>6</sup>*Summit on Educational Games: Harnessing the Power of Videogames for Learning*. Federation of American Scientists. 2006. Washington DC.

<sup>7</sup>Maney, Kevin "Videogames Aren't Necessarily Turning Kids' Brains to Mush." *USA Today*. Jul. 13, 2005.

<sup>8</sup>Len, Annetta. "Videogames and Simulations as Teaching Tools." *Multimedia & Internet@ Schools*. Nov./Dec. 2007. 14:6.

<sup>9</sup>*Summit*.

<sup>10</sup>Bradley, Ann. "Media-Use Study Finds Youths Increasingly Multi-Tasking." *Education Week*. Mar. 16, 2005. 24:27.

<sup>11</sup>*Summit*.

students and requires them to read from texts, listen to lectures and repeat the information back on worksheets, in class discussions, in reports, and on tests.<sup>12</sup>

Kurt Squire and Constance Steinkuehler, in a 2005 article they wrote for *Library Journal*, outline many educational skills that videogames help develop. They feel today's students need to have the ability to handle competing information from multiple sources.<sup>13</sup>

The skills that make gamers successful often help them be more sociable and develop strategic thinking and leadership skills, according to the book *Got Game* by John Beck and Mitchell Wade.<sup>14</sup>

### **Today's Teachers are Different**

A growing number of today's educators realize that videogames are embedded with core academics and require analytical problem solving skills. In a 2006 article in *Business Week*, Edward Cliff explained that games can convey a different perspective than students can get from a text book or even from going to a museum and looking at things in glass cases. Games often require students to do math. Games also help students to think creatively and to be innovative.<sup>15</sup>

In 2006, 10% of teachers were using videogames in the classroom. The increased use of videogames is the result, in part, of more young teachers, who grew up playing games, recognizing the value of incorporating interactive features into learning. Games involve a lot of problem solving and constructive thinking.<sup>16</sup>

Many older teachers are not part of the gaming culture. James Paul Gee, UW-Madison, believes that teachers who lament videogames are missing an important point. Gaming requires reading, problem-solving, and critical thinking skills. Games help teens learn in a way that is unfamiliar to many teachers.<sup>17</sup> Many teachers are using games to help teach concepts that have been historically hard to teach and difficult for students to learn.<sup>18</sup> One important difference between videogames and television is that games are interactive, so users do not have a passive role, as they do with television.<sup>19</sup>

The final report from the *Summit on Educational Games* states that properly designed videogames have the potential to improve student motivation as well as the educational outcomes, and facilitate the transfer of learned skills to practical application. However, teachers must have a sound understanding of which game features are important and the why and how of best design that result in positive learning outcomes. The final report indicates that teachers will need to continue to work to include gaming innovations in their teaching and redesign instructional practices and learning environments to take advantage of the exploration, interactivity, and collaboration that digital games and simulations offer.<sup>20</sup>

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<sup>12</sup>*Summit*.

<sup>13</sup> Squire, Kurt and Steinkuehler, Constance. "They Research, Teach, Learn, and Collaborate. So Far Without Libraries." *Library Journal*. Apr. 15, 2005.

<sup>14</sup> Beck, John and Wade, Mitchell. *Got Game*. Boston, MA: Harvard Business School Press. 2004.

<sup>15</sup> Cliff, Edward. "Class Take Out Your Games." *Business Week*. Feb. 20, 2006. Issue 3972.

<sup>16</sup> Danforth, Elizabeth. "Games, Gaming, and Gamers: Why You Want Them in Your Libraries." *BiblioTech*. Oct. 2007.

<sup>17</sup> Gee.

<sup>18</sup> Len.

<sup>19</sup> Oakley, Trevor. "Circulating Videogames." *School Library Journal*. Apr. 2008. 54:4.

<sup>20</sup>*Summit*.

James P. Gee believes there is a need to shape learning and learning environments so that games can be integrated into the school environment. Games can lead to learning through meaningful activity in virtual world, as preparation for meaningful activity in the real world.<sup>21</sup>

The *Summit* report calls on colleges that train teachers to make new training materials available to prospective teachers and require game-based skills and learning as an integral part of the teacher training they offer. The training should include how to best coordinate virtual and real world learning activities.<sup>22</sup>

### **Today's Game Designs Are Different**

The final report from the *Summit on Educational Games*, points out that one value of videogaming has to do with their motivational factor. The motivational factor of gaming may have some very important applications in the educational process. Because players are so interested in the game they continue to play the same game again and again, even after repeated failure, in an effort to get better at the game. One reason games are good teaching tools is that they start off easy and gradually get harder. There is also a "circle of no consequences" that makes it okay to fail. There are no repercussions in the real world for failure at a game. In education there is an emphasis on success within a given time frame that creates pressure. Some students do not perform well under that pressure.<sup>23</sup>

In an article written in 2007 for *School Library Journal*, Eli Neiburger, Ann Arbor Public Library, Michigan, made the argument that videogames promote various types of information literacy, help gamers develop information seeking habits, require research skill, and encourage writing. Neiburger adds that videogames also help develop reasoning skills.<sup>24</sup>

James Paul Gee, UW-Madison, explains what he calls the "regime of competence principle." This refers to the design of videogames that assures that every level in a game is on the outer limits of the player's ability, just hard enough to be a challenge, but still allow the player to be successful. This gives gamers a sense of simultaneous pleasure and frustration. Steve Johnson asserts in his book, *Everything Bad is Good for You*, that videogames are "brilliantly designed puzzles." Finishing a complex game requires discipline, problem solving, decision making, and repeated trial and error.<sup>25</sup>

An article in *Harper's Magazine* in 2006, Thomas de Zengotita stated that videogames have become vastly more complex than they were in the past.<sup>26</sup> Kevin Maney said in his article in *USA Today*, that games today can be divided into entertainment and serious game categories. He feels games are getting much more realistic, and can be incredibly motivating. He asserts that at some point the use of games as entertainment may be dwarfed by serious game applications.<sup>27</sup>

Games can be used in the classroom to help students think critically, teach students cause and effect, and anticipation of consequences. In their book, *How Videogames Help Children Learn*, David Williamson Shaffer and James P. Gee, UW-Madison, assert that some game experiences can be more real than those they have in school. One example involves elections. Student body elections are intended to help students understand government and democracy, but not all

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<sup>21</sup>Gee.

<sup>22</sup>*Summit*.

<sup>23</sup>*Summit*.

<sup>24</sup>Neiburger.

<sup>25</sup>Johnson, Steve. *Everything Bad Is Good for You*. NY:Riverhead. 2005.

<sup>26</sup> de Zengotita, Thomas. Avrich, Jane, Kster, Ralph, and Johnson, Steven. "Grant Theft Education," *Harper's Magazine*. Sep. 2006. 313:1876.

<sup>27</sup>Maney.

students run or participate in the governing process. But a game like “The Political Machine” allows all students to manage a campaign, decide platforms, plan fund raising strategies, and develop advertising messages.<sup>28</sup> Cindy Long explains in her article for *NEA Today*, that games can teach students to be innovators and to learn to think like engineers, urban planners, journalists, lawyers, and other professionals.<sup>29</sup> Gee and other researchers at UW-Madison also believe videogames, based on the training of socially valued practices, will create an educational system in which students learn to work and think as professionals. The purpose is not to train students for these professions, but rather to provide students with an opportunity to see the world in a variety of ways that are fundamentally grounded in meaningful activity and aligned with core skills, habits, and understandings of a postindustrial society. Games will help students create representations of professional knowledge.<sup>30</sup>

Shaffer and Gee assert that to survive and win in many games, players must learn and think like professionals in that world. Games preserve the linkage between knowing and doing. By doing, as well as knowing, in gaming worlds, students will learn to apply information in new contexts in their real world and to see the world in new ways.<sup>31</sup>

Videogames are very effective at teaching logical, consequential thinking.<sup>32</sup> U.S. Army studies indicate playing videogames as much as ten hours can improve the ability to process visual information and improve overall spatial orientation skills.<sup>33</sup>

Squire and Steinkuehler believe games involve participation in collective intelligence, and blur the distinction between the production and consumption of information. They emphasized expertise rather than social status. They promote international and cross-cultural media and communities. Many characteristics of games run counter to print era institutions and thinking.<sup>34</sup>

According to Gee and his associates, computers are changing the way students learn, making videogames more than just toys; they create new social and cultural worlds that help people learn by integrating thinking, social interaction, and technology. Games are inherently simplifications of reality, but they are at their most powerful when they are personally meaningful, experiential, and social all at the same time.

Deniese Agosto maintained, in her article for *Teacher Librarian*, that videogames allow students to think, talk, and act in roles otherwise inaccessible to them. She feels rich virtual worlds make games a powerful context for learning. They make it possible to develop situated understanding of concrete realities that words and symbols describe.<sup>35</sup>

### **Differences in the Way Boys and Girls Interact with Videogames**

One important consideration in the use of videogames in education is the gender difference in the way males and females interact with these games. The differences have been studied for the past two decades in regard to the amount of time girls and boys spend on computers, types of games that appeal to both, and the educational implications. Denise Agosto summarized some of

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<sup>28</sup>Shaffer, David Williamson and Gee, James P. 2006. *How Videogames Help Children Learn*. NY: Palgrave Macmillan.

<sup>29</sup>Long, Cindy. “Educators Got Game.” *NEA Today*. Oct. 2007. 26:2.

<sup>30</sup>Gee.

<sup>31</sup>Shaffer.

<sup>32</sup>de Zengotita.

<sup>33</sup> Suellentrop, Chris. “Playing with Our Minds.” *Wilson Quarterly*. Summer 2006 30:3.

<sup>34</sup>Squire.

<sup>35</sup>Agosto, Denise. “Girls and Gaming: A Summary of the Research with Implications for Practice.” *Teacher Librarian*. Feb. 2004. 31:3.

the studies in an article she wrote for *Teacher Librarian* magazine. While boys and girls can become equally skilled with computer games, boys tend to choose to play them more often than do girls.

Agosto said studies indicate that as girls mature, their interest and time investment in games declines. Because girls spend less time with computer than do boys, they enter computer science courses and workshops with less computer comfort and experience. One study found that ten and eleven-year-old girls exhibited generally poorer spatial skills when they played videogames, making more errors in judging speed and distance than boys. Another study found that when girls worked in pairs or small groups they solved significantly more math puzzles than girls who worked alone. The opposite was true for boys.

Some researchers suggest girls lose interest because most computer games are designed for and marketed to boys, according to Agosto's article. Boys are more likely than girls to talk about games, read game magazines, trade games, and express pride in the number of games they own.

Computer confidence can affect girls' success with problem solving activities and encourage them to tackle math problems. Agosto said a number of studies examined girls' preference in computer games. Boys preferred a contest between good and evil. Girls tended to favor storylines and character development and are more interested in the storyline than competition. They are more interested in exploring the characters' personalities than winning.

Girls prefer collaboration over competition, educational rather than entertainment games, and games that focus on human relationships. They have a strong preference for female characters and prefer to play with other girls than to play alone. The tendency for girls to prefer games that allowed them to communicate with other people carried through to female college students. A 2001 study found that undergraduate girls use the Internet primarily to send email, while males used it primarily to search for factual information.<sup>36</sup>

Constance Steinkuehler, assistant professor at UW-Madison's Department of Curriculum and Instruction, has focused her research on teen boys who are disaffected with school. She has found that they voluntarily pick up gaming manuals and contribute to player forums. They demonstrate high levels of collaboration and leadership. Game playing enables participants to interact with diverse people from different walks of life, culture, and age groups.<sup>37</sup>

Steinkuehler believes well-designed videogames hold promise for constructively re-engaging middle and high school boys who have lost interest in school. These same boys are gamers who frequent virtual worlds where they develop expertise and gain self confidence they don't have at school.

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<sup>36</sup>Agosto.

<sup>37</sup>Squire.

## BIBLIOGRAPHY

- Agosto, Denise. "Girls and Gaming: A Summary of the Research with Implications for Practice." *Teacher Librarian*. Feb. 2004. 31:3. [www.girlstech.douglass.rutgers.edu/PDF/GirlsAndGaming.pdf](http://www.girlstech.douglass.rutgers.edu/PDF/GirlsAndGaming.pdf)
- Beck, John and Wade, Mitchell. *Got Game*. Boston, MA: Harvard Business School Press. 2004.
- Bradley, Ann. "Media-Use Study Finds Youths Increasingly Multi-Tasking." *Education Week*. Mar. 16, 2005. 24:27. [www.edweek.org/ew/articles/2005/03/16/27brief-5.h24.html](http://www.edweek.org/ew/articles/2005/03/16/27brief-5.h24.html)
- Cliff, Edwards. "Class Take Out Your Games." *Business Week*. Feb. 20, 2006. Issue 3972. [www.businessweek.com/@@Vtdep4YQ2gtgtR0A/magazine/content/06\\_08/b3972100.htm](http://www.businessweek.com/@@Vtdep4YQ2gtgtR0A/magazine/content/06_08/b3972100.htm)
- Danforth, Elizabeth. "Games, Gaming, and Gamers: Why You Want Them in Your Libraries." *BiblioTech*. Oct. 2007. <http://sobibliotech.blogspot.com/2007/10/games-gaming-and-gamers-why-you-want.html>
- de Zengotita, Thomas, Avrich, Jane, Koster, Ralph, and Johnson, Steven. "Grand Theft Education." *Harper's Magazine*. Sept. 2006. 313:1876. <http://harpers.org/subjects/ThomasDeZengotita>
- Gee, James P, Halverson, Richard, Shaffer, David Williamson, and Squire, Kurt R. *Video Games and the Future of Learning*. Wisconsin Center for Education Research, School of Education, University of Wisconsin-Madison. 2005. [www.wcer.wisc.edu](http://www.wcer.wisc.edu)
- Johnson, Steve. *Everything Bad Is Good for You*. NY:Riverhead. 2005.
- Len, Annetta. "Video Games and Simulations as Teaching Tools." *Multimedia & Internet@ Schools*. Nov./Dec. 2007. 14:6.
- Long, Cindy. "Educators Got Game." *NEA Today*. Oct. 2007. 26:2.
- Maney, Kevin "Video Games Aren't Necessarily Turning Kids' Brains to Mush." *USA Today*. Jul. 13, 2005. [www.usatoday.com/tech/columnist/kevinmaney/2005-07-12-video-games\\_x.htm](http://www.usatoday.com/tech/columnist/kevinmaney/2005-07-12-video-games_x.htm)
- Mayer, Brian. "Gaming, School Libraries and the Curriculum." *Library Gamer*. Feb. 11, 2008. <http://librarygamer.wordpress.com/2008/02/11/gaming-school-libraries-and-the-curriculum/>
- Neiburger, Eli. "Games...in the Library?" *School Library Journal*. Jul. 2007. 53:7.
- Oakley, Trevor. "Circulating Video Games." *School Library Journal*. Apr. 2008. 54:4. [www.schoollibraryjournal.com/article/CA6545437.html](http://www.schoollibraryjournal.com/article/CA6545437.html)
- "Principles of Learning in Video Games." *Gifted Child Today*. Spring 2006. 29:2, p.9.
- Rich, Motoko. "Literacy Debate: Online, R U Really Reading?" *New York Times*. Jul. 17, 2008. [www.nytimes.com/2008/07/27/books/27reading.html?pagewanted=4&ei=5070&en=018a275d92417649&ex=1217995200&emc=eta1](http://www.nytimes.com/2008/07/27/books/27reading.html?pagewanted=4&ei=5070&en=018a275d92417649&ex=1217995200&emc=eta1)
- Shaffer, David Williamson and Gee, James P. *How Videogames Help Children Learn*. NY: Palgrave Macmillan. 2006.
- School of Education. "Serious about the Games We Play." University of Wisconsin-Madison. Jun. 12, 2008 [www.education.wisc.edu/news.details/2006.aspx?articleid=160&soneid=1](http://www.education.wisc.edu/news.details/2006.aspx?articleid=160&soneid=1)

Squire, Kurt and Steinkuehler, Constance. "They Research, Teach, Learn, and Collaborate. So Far Without Libraries." *Library Journal*. Apr. 15, 2005. [www.libraryjournal.com/article/CA516033.html](http://www.libraryjournal.com/article/CA516033.html).

Suellentrop, Chris. "Playing with Our Minds." *Wilson Quarterly*. Summer 2006 30:3.  
[www.suellentrop.com/chris\\_suellentrop/2006/10/playing\\_with\\_ou.html](http://www.suellentrop.com/chris_suellentrop/2006/10/playing_with_ou.html)

*Summit on Educational Games: Harnessing the Power of Video Games for Learning*. Federation of American Scientists, Washington DC. 2006. [www.fas.org/gamesummit/](http://www.fas.org/gamesummit/)

Ward-Crixell, Kit. "Gaming Advocacy." *School Library Journal*. Sept. 2007. 53:9.  
[www.schoollibraryjournal.com/article/CA6472364.html?q=gaming+2007](http://www.schoollibraryjournal.com/article/CA6472364.html?q=gaming+2007)