Videogames in Education
Comparing Students', Student Teachers' and Master Teachers Opinions and Experiences

David Kaufman
Faculty of Education, Simon Fraser University, 8888 University Drive, Burnaby, Canada

Keywords: Videogames, Education.

Abstract: The purpose of this study was to compare secondary students' experiences and opinions about videogames and their use in education with those of student and experienced master teachers selected by a university to serve as teacher educators. The results of this study demonstrated that a significant majority of secondary school students and student teachers played videogames, compared to a significant majority of experienced master teachers who did not play them. A majority of secondary students and student teachers thought it was a good idea to use videogames to help teach in secondary education, compared to a majority of experienced teachers who did not think this was a good idea. However, a majority of respondents from all three groups thought that videogames could add educational value to the secondary curriculum. There were significant differences for all three participant groups between those who played videogames versus those who did not.

1 INTRODUCTION

Videogames are a common form of entertainment for students in North America. Their participation is often a social experience that happens at home with friends or other players in multiplayer online games like Free Realms™, Halo™, or World of Warcraft ™. These games often require strategic thinking, technical language, and sophisticated problem solving skills (Shaffer, 2006). The levels of player participation, skill mastery, and thought processes required by videogames are attractive to secondary students because they present engaging and challenging virtual experiences which players are able to control and eventually master. The power of videogames to engage young people and hold their attention for long periods of time is a subject of great interest to educators and researchers (Kaufman and Sauvé, 2010). There is a growing sense that videogames are educational; they can teach something (Aldrich, 2005, p.134). Many educators recognize that videogame technologies are highly sophisticated; students are interacting with subject content in ways that differ greatly from established methods of classroom instruction. Some writers even assert that students are exposed to learning processes outside of school that are deeper and richer than the processes they are exposed to in the classroom (Gee, 2005, p.112). Therefore, it appears that videogames can provide constructive, meaningful experiences for students, incorporating educational best practices and learning theories that are relevant in today's world.

However, there is concern in the educational community about the effectiveness of videogames for supporting classroom instruction, how to adapt them into the existing curriculum, the logistics of implementation, and controversy about their possible negative effects.

2 A LEARNING RESOURCE

The ability of videogames to engage and hold the attention of players is well known. They provide the opportunity of learning by doing, by experiencing situations first hand, and through role play (Rickard and Oblinger, 2004, cited in Annetta et al., 2009, p.74). Videogames are user-centered, promoting challenges, co-operation, engagement, and the development of problem solving strategies (Gros, 2007, p.23). Seymour Papert (1994) explained that the best videogames draw children into some very hard learning (Papert, 1994, cited in Prensky, 2001,

Kaufman D..
Videogames in Education - Comparing Students', Student Teachers' and Master Teachers Opinions and Experiences.
DOI: 10.5220/0004383701010105
In *Proceedings of the 5th International Conference on Computer Supported Education* (CSEDU-2013), pages 101-105
ISBN: 978-989-8565-53-2

p.180). Aldrich (2005) stated "people learn better when they don't know they are learning" (p.34). In designing and producing a commercially successful videogame, game developers create experiences that motivate players, requiring them to use different kinds of problem solving and thinking skills so they can learn to master the game's content.

Research literature suggests that playing videogames outside of school can help to contextualize content learned in the classroom. Videogames can provide an authentic learning experience for some students by presenting content in a meaningful way that gives them prior knowledge for dealing with academic material at school (Abrams, 2009, p.344). Videogames are a form of alternate literacy practice that is not readily recognized by educators who are required to meet curricular needs (Madill and Sanford, 2007, p.435). They have little experience with videogames and do not see the multiple learning opportunities available to their students. Halverson (2005) argued that participation in game based learning environments can help educators appreciate playing videogames as a legitimate form of learning (p.7).

3 BARRIERS TO VIDEOGAMES IN THE SCHOOLS

The literature demonstrates that there is considerable resistance by educators to using videogames in the schools. Klopfer and Yoon (2005) explained "…videogames and learning have had a tumultuous relationship because many perceive videogames as taking away time from productive learning activities…" (p. 35). An adversarial relationship exists between the cultures of gaming and schooling; school leaders and teachers react negatively to videogames and gaming culture (Halverson, 2005). Videogames are portrayed as a distraction from education that prevents reflection by offering immersive, addictive experiences (Pelletier, 2005). De Freitas (2006) commented: "…there has been a dominant perception of gaming as a leisure pursuit with no pedagogic value…" (p.16). She suggested there were legitimate barriers affecting the use of videogames for learning in schools that included lack of familiarity with game-based software, lack of communities of practice for guidance and support, limited preparation time for learning, lack of access to the required hardware, the cost of software, and the need for necessary technical support (De Freitas, 2006, p.16).

Kirriemuir and MacFarlane (2004) contended that obstacles to using videogames in the classroom include the length of scheduled class periods, verifying a videogame is suitable for learning purposes, the necessary support materials and training required for teachers, and the costs associated with purchasing hardware and software (Kirriemuir and MacFarlane, 2004, p.7). In 2008, the department of Educational Technology at Korea National University surveyed 479 elementary and secondary teachers to determine the factors that inhibited them from using videogames in the classroom. Six significant factors were identified – budget limitations, curricular inflexibility, fixed class schedules, lack of support materials, negative opinions about videogames, and student unreadiness (Baek, 2008, p.669).

The literature shows that the use of videogames in education is a contentious issue. The purpose of this study is to address this issue by comparing secondary students' experiences and opinions related to videogames and their use in education with those of student teachers and exemplary experienced teachers.

4 RESEARCH METHOD

4.1 Participants

Three unique groups were surveyed at a western Canadian university. The master teacher group consisted of 27 exemplary professional educators selected by SFU to act as mentors. The student teacher group consisted of 45 student teachers training to become professional educators. The secondary student group comprised 85 grade ten, eleven and twelve students from four secondary schools in a suburb of Vancouver, British Columbia, Canada. Participants in each of the three groups were required to give their consent. Anonymity was maintained in this study; the participants were not asked to give their names.

4.2 Procedures

The online survey consisted of five sections that featured a combination of 35 multiple choice and open-ended questions. Section One examined the participants' level of experience and knowledge of videogames. Section Two asked about their specific experiences with video game hardware and software, frequency of play, with whom the participant played videogames, and experiences of playing videogames

at school. Section Three examined the participants' opinions about controversial issues concerning videogames. Section Four examined participants' opinions about videogames and their use in education. Section Five provided open-ended questions that asked about participants' experience with videogames and opinions about using them for educational purposes.

The researchers recruited the respondents personally through class visits and meetings, and participants then completed the surveys during a two-week period. Master teacher and student teacher survey participants were provided with a unique URL web address hosted by Fluid Surveys (http://www.fluidsurveys.com), a Canadian web-based online survey system. Secondary student participants were provided with a unique URL web address hosted on the SFU Web Survey site (http://websurvey.sfu.ca). They completed the survey at computer laboratories in their respective secondary schools. Two classes of secondary students completed hardcopy versions of the online survey that were provided by their teachers.

The data analysis consisted of using PASW (SPSS ver18) to conduct descriptive and inferential data analyses. The three groups were compared on several key items; then an independent samples t-test was used to compare videogame players versus non-players about their opinion regarding the use of videogames in education.

5 FINDINGS

5.1 Videogame Playing Patterns

A majority of secondary students and student teachers reported that they played videogames, compared to a majority of master teachers who said that they did not play videogames. These figures are significant when compared to the age distribution for each participant group. 97% percent of the secondary students were between the ages of 14 and 24 years. 90.5% of the student teachers were between the ages of 18 and 34 years. 96% of the master teachers were older than 35 years, and 48% of them were over 45 years. The results suggest that the majority of young adult participants (under 35 years) play videogames and a majority of participants over 35 years do not play videogames.

5.2 Opinions about Playing Videogames

Almost a quarter of secondary students reported that playing videogames was their favorite kind of entertainment (22.1%) and almost half (43.0%) felt that videogames were just as much fun as other forms of entertainment. More than half of student teachers reported that videogames were fun but that they preferred other forms of entertainment (55.6%). However, more than half of the master teachers did not think videogames were fun and preferred other forms of entertainment (51.5%). The results show that there is a significant difference of opinion between secondary students and master teachers about the entertainment value of videogames.

5.3 Using Videogames to Help Teach

Almost half of secondary school students (47.7%) and a great majority of student teachers (77.3%) think that using videogames to help teach in secondary education is a good or a great idea. More than half of the master teachers (53.6%) think that using videogames to help teach in secondary education is not a good idea or is a terrible idea.

5.4 Educational Value in Secondary School

Table 1: Educational Value of Videogames.

Educational value added	Secondary students		Student teachers		Master teachers	
	N	%	N	%	N	%
Much	21	27.3	2	4.5	0	0.0
Some	38	44.2	24	54.5	15	53.6
Little	18	23.4	16	36.4	8	28.6
None	0	0.0	2	4.5	5	17.9

A majority of secondary students (71.5%) and student teachers (59.0%) think that there is educational value in using videogames in the secondary school curriculum. An interesting fact here is that the master teachers were almost evenly split in their opinion on this question; 53.6% thought that videogames add educational value, while 46.5% did not. Another question in the survey asked secondary students what their teachers would think about using videogames in the classroom. 58% os secondary students said their teachers would think this was a good idea; however, 71% of master teachers said they thought it was not a good idea.

The secondary students' responses were much too optimistic.

5.5 Comparison of Non-Player Vs. Player Opinions

Table 2: Comparison of Non-Player vs. Player Opinions about using Videogames in the Classroom.

Respondent	N	Mean* (SD)	t	p
All respondents				
-Non-videogame player	45	2.80 (1.39)	3.83	.000***
-Videogame player		3.81 (1.45)		
Secondary school students				
-Non-videogame player	6	1.17 (0.41)	9.84	.000***
Videogame player	55	3.87 (1.66)		
Student teachers				
Non-videogame player	18	3.72 (1.18)	.297	.768
Videogame player		3.62 (1.17)		
Master teachers				
Non-videogame player	21	2.48 (1.17)	3.09	.005**
Videogame player	7	4.00 (1.00)		

*Based on a five-point Likert scale
** Significant at the .01 level
*** Significant at the .001 level

Respondents who played videogames were significantly more positive than those who did not play about the idea of using videogames in the classroom. However, there were no differences observed in the student teacher group between videogame players and non-players as both groups responded quite positively about using videogames in the classroom.

6 DISCUSSION AND CONCLUSIONS

The results of this study strongly suggest that professional educators do not have the same level of experience or knowledge about videogames compared to secondary students and student teachers. Because experienced teachers do not play videogames, they are not aware of the broad range of game software experiences their students have outside of school, particularly the level of social networking that now takes place with multiplayer online games played through physical or wireless internet connections. The results demonstrate that there is an 'electronic entertainment generation gap' between professional teachers, secondary students, and student teachers. Master teachers are in positions of educational leadership in their school districts, yet the survey results point to a significant lack of understanding about this influential form of entertainment technology in which students actively participate outside of school.

The survey results also showed that the student teachers are more open to the idea of using them for educational purposes than the master teachers. As they assume positions of leadership in a school or district, this group might contribute to a greater acceptance among educators of using videogames to supplement instruction.

There are educators today who believe that videogames can motivate students who do not respond to traditional methods of instruction. Kurt Squire (2005) considered this fact when he wrote his case study about teaching history with Civilization III™ (Squire, 2005). A few educational institutions and individual educators continue to take the initiative and use videogames for teaching educational content. However, the educational research literature and the results of this study demonstrate that a significant gap exists between experienced educators versus secondary school students and student teachers about their experience and opinions related to videogame technology. Students are enthusiastic adopters of technology, but they do not necessarily possess expert knowledge about how to use it wisely. Educators with limited videogame experience do not understand the technology's potential for classroom instruction. Given the levels of challenge, creative quality, engagement, and immersion contained in modern videogames, educational administrators and policymakers need to work with educators to better understand the influence and scope of this form of electronic entertainment. Current cohorts of student teachers need more training about how to help students and their parents deal with the growing influence of these new technologies and how to incorporate them effectively as a useful addition to their curricula.

REFERENCES

Abrams, S., 2009. A gaming frame of mind: digital contexts and academic implications. *Educational Media International*, 46(4), pp.335-47. Available at <http://dx.doi.org/10.1080/09523980903387480> [Accessed 6 April 2010].

Aldrich, C., 2005. *Learning by doing*. *A comprehensive guide to simulations, computer games, and pedagogy in e-learning and other educational experiences*. San Francisco. John Wiley & Sons.

Annetta, L., Cheng, M., Holmes, S., and Minogue, J., 2009. Investigating the impact of videogames on high school students' engagement and learning about genetics. *Computers & Education*, 53(1), pp.74-85.

Baek, Y., 2008. What hinders teachers in using computer and video games in the classroom? Exploring factors inhibiting the uptake of computer and video games. *Cyberpsychology & Behavior*, 11(6), pp.665-71.

De Freitas, S., 2006. *Learning in immersive worlds. A review of game based learning*. London: JISC e-Learning Programme.

Gee, J.P., 2005. *Why video games are good for your soul*. Champaign, IL: Common Ground Publishing.

Gros, B., 2007. Digital games in education: the design of games-based learning environments. *Journal of Research on Technology in Education*, 40(1), 23-38.

Halverson, R., 2005. What can K-12 school leaders learn from video games and gaming? *Innovate: Journal of Online Education*, [e-journal] 1(6). Available at <http://www.innovateonline.info/index.php?view=article&id=81> [Accessed 10 December 2012].

Kaufman, D., and Sauvé, L., 2010. *Educational gameplay and simulation environments; case studies and lessons learned*. Hershey, PA: IGI Global.

Kirriemuir, J., and McFarlane, A., 2004. *Games and Learning*. Bristol, UK: Futurelab. Available at < http://archive.futurelab.org.uk/resources/publications-reports-articles/literature-reviews/Literature-Review378> [Accessed 5 December 2012].

Klopfer, E., and Yoon, S., 2005. Developing games and simulations for today and tomorrow's tech savvy youth. *TechTrends,* 49(3), pp.33-41.

Madill, L., and Sanford, K., 2007. Understanding the power of new literacies through video game play and design. *Canadian Journal of Education*, 30(2), pp.432-55.

Pelletier, C., 2005. Studying games in school: a framework for media education. In the *2005 conference of the Digital Games Research Association (DiGRA), Changing Views: Worlds in Play.* Vancouver, BC, Canada 16-20 June 2005.

Prensky, M., 2001. *Digital game based learning*. St. Paul, MN: Paragon House.

Shaffer, D.W., 2006. *How computer games help children learn.* New York: Palgrave.

Squire, K., 2005. *Changing the game: what happens when video games enter the classroom*? *Innovate: Journal of Online Education*, [e-journal] 1(6). Retrieved from http://www.innovateonline.info/pdf/vol1_issue6/Changing_the_Game-__What_Happens_When_Video_Games_Enter_the_Classroom_.pdf.