

Video Games In Education

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Abstract

The purpose of this paper is to review relevant literature that explored the impact of video games within the field of education. Through a review of studies on video games in education, between 2000 and 2015, I aim to discuss that video games do have educational value in multiple content areas k-12, and educators have effectively implemented video games consistently through the same approaches. In addition, I discuss that there are existing limitations within schools due to educators and a lack of adequate technology available to support the implementation of video games into education. My analysis of the current literature confirms Alexander et. al. (2010) claim that video games can be utilized in every content area, while refuting Alexander et. al. (2010) claim for the best approach for video game implementation into the classroom currently, as well as that I believe educators and a lack of technology are responsible for the very minimal implementation of video games into education. With this in mind, it is my hope that, with this knowledge, the education system can implement video games better to meet student needs and improve educational practice. Finally, I make recommendations for the future of student learning and instruction, as well as ideas for future research.

Chapter 1: My childhood relationship with video games

I remember the moment as if it were yesterday. I begged and begged my mother and father for a Nintendo 64™ for Christmas. I anxiously waited to open my presents and when it was time, I raced downstairs. After all the gifts were passed out to family members, I began tearing through the wrapping paper as though I was possessed. In the aftermath of the wrapping paper onslaught, there was one thing still missing: Nintendo 64™. My hopes and dreams had been dashed away in a flash, until my father said that the gifts unwrapped were not the last. My father pointed to the tree and a card underneath. “There is one more for you,” he said. Inside the card, were directions to go to the basement to find another present: a blanket covered package. It was a television. Attached to the television was another mysterious card attached, this time with directions to go to the garage. Palms sweaty, heartbeat racing, I hoped and hoped that a Nintendo 64™ would be waiting. In the garage was another large package wrapped with [blue paper and snowmen]. I opened the package and inside, it contained a television entertainment stand. However, there was no card, no more directions, no Nintendo 64™. I have to admit, I was sad that my dream did not come true, but still a television set was way cool.

As we sat and ate Christmas breakfast, my mother asked me to go into the living room and turn on the radio. There sat a Nintendo 64™, replete with games and three controllers, completely installed and ready to go! I raced to my parents and hugged them as they laughed with joy. It was then, that my love for video games began and remains to this day.

As a kindergartener, I remember learning through an interactive computer game that allowed me to select dinosaurs I was interested in learning about. I selected the T-Rex. I heard sounds within this game of a pterodactyl flying overhead and remember how the trees rustled, as

the T-Rex maneuvered through a jungle; thud-thud-thudding with every step. At various points, the game would stop and provide me with information, such as what helped the T-Rex to catch its food, as well as what hindered the T-Rex (in particular, the short arms). At one point in the game, the sky and screen began to flash, dinosaurs were running in every direction, and then there was a loud crashing sound. The computer screen had gone blank; after which, a narrator began describing the tragic incident in which a meteor had killed off the dinosaurs. What I remember was that the game inspired me to want to learn about dinosaurs.

As I grew older, my love of video games I played in school ranged from Oregon Trail™ to My Life™ I loved making the virtual trek from Independence Missouri, to Oregon's Willamette Valley on the Oregon Trail. I learned to trade for wagon parts, oxen, clothing, food and ammunition. I hunted rabbits or deer for food to survive, while attempting to avoid the dreaded diphtheria, or the attacking grizzly bear.

My Life™, on the other hand, offered me the experience to be twenty-five years old. I could choose whether to go to school or start my career, which then led to choosing a career and the responsibility for paying bills. I had the ability to select where I lived, what car I drove, or whether I wanted internet or cable. I learned how to establish a budget to accommodate unexpected car breakdowns and trips to the grocery store for food. Essentially, I was learning necessary life skills, especially personal finance.

Fast-forward to today: I still love to play video games, and have upgraded my Nintendo 64™ gaming console to an Xbox One™. I play video games regularly every week for at least four hours and consider myself a gamer. Through video games, I was able to connect with friends globally to socialize and accomplish tasks that required teamwork, effective

communication, and skill. Video games have become a major part of who I am, and has significantly influenced my life; even my learning.

Now that I am an elementary teacher, video games within the classroom have changed from what I remember and cherish from my school days. Still, it is no leap to think that video games can help students learn, especially with all of the advancements in technology. Ultimately, the one question that emerged as I reflected was how can video games be utilized in an educational context?

Problem Statement

To be clear on what a video game qualifies as, according to Crawford (2012), a video game is “a game played by electronically manipulating images produced by a computer program” (p. 4). With this definition, any computer game, application, or console game qualifies as a video game because computer games, applications, and console games require players to manipulate electronic images within the computer programs. Within this analytic review of relevant literature, I focus specifically on the use of video games within classrooms k-12 by educators, as well as their impact on student learning. Gee (2007) suggests in his book *What Video Games Have to Teach us About Learning and Literacy*, that video games have educational value as an instructional tool within the classroom. It is important to note that the book is an anecdotal exploration of video games Gee (2007). According to Gee (2007), “Video games engage players in powerful forms of learning, forms that we could spread in various guises, into schools, workplaces, and communities where we wish to engage people with “education” (p. 216). Gee argues that video games have the potential to engage and motivate learners, while also providing education in multiple ways. Alexander, Eaton, and Egan (2010) later confirmed Gee’s belief that video games (through specific learning principals) engage students to enhance their

learning experience. Through a meta-analysis of empirical research, Alexander et al. (2010) agrees that video games have the potential to engage, motivate, and provide learning experiences to its' players. Alexander et al. (2010) claims, video games can be utilized in content areas and also adds that there are three ways, in which educators can implement video games into classroom instruction. The three ways that educators can implement video games into classroom instruction are as follows: 1) Electronic games possess educational value and by having players interact with them they are engaged in significant learning, 2) Video games do not possess initial educational value, but content can be interwoven through instruction 3) Video games are used as a simulation and have a direct tie to the curriculum Alexander et al., 2010, p. 1833-1839).

Despite these approaches, Alexander et al. (2010) believes that the most effective way to implement video games is to take the learning principals from video games and apply them to the curriculum to make it more engaging to students because the aforementioned ways promote "superficial" learning. Alexander et al. (2010) determined that the learning principals within video games that fundamentally engage students are as follows: narrative structure, "heroic" human qualities, vivid images, emotional engagement, extreme exotic events and locations, binary conflicts and structure, and role-playing. Although I agree with Alexander et al. (2010) up to a point, I cannot accept his overall conclusion that the best way to meet student needs is through the development of learning principals to match the curriculum. Based on my review of relevant literature, I believe that implementing video games into the classroom through the previously mentioned methods is the best approach for education currently. To reiterate, the three methods with which I believe video games should be mentioned are: electronic games possess educational value and by having players interact with them they are engaged in significant learning, 2) video games do not possess initial educational value, but content can be

interwoven through instruction 3) video games are used as a simulation and have a direct tie to the curriculum (Alexander et al., 2010, p. 1833-1839). To guide my research, I developed two research questions, which are as follows: 1) How are video games utilized in an educational context currently? 2) What value, if any, do video games actually hold for student learning?

Significance of the problem

To understand fully the problem and its significance, we must first go back to the 1980s. In 1980, video games were introduced to the world for the first time and became a significant part of adolescents' and children's lives, resulting in nearly one hour a day being devoted to video games (Carstens & Beck, 2004, p. 22). As a result of the interaction, video games changed the mindset of a generation of children for the future. According to Carstens and Beck (2004), the American business professionals they interviewed shows that nearly four out of five managers have videogame experience, and out of the total 2,500 surveyed, sixty-three percent identified themselves as frequent gamers and believe that winning is everything and competition is the law of nature, as opposed to fifty-five percent non-gamers that believe conversely (Carstens & Beck, 2004, p. 23). From their work, it can be justified that the "gamer generation" virtually has different beliefs and learning styles, than those whom do not interact with video games (Carstens & Beck, 2004, p. 23). Therefore, it is important that educators are supporting their student's interests, as well as their needs academically.

Educators, recognize that all students are different and come to school with a wealth of knowledge and learning styles that are unique to each student. Gonzalez, Moll, and Amanti (2005) created a theory regarding this prior wealth of knowledge known as *funds of knowledge*. According to Gonzalez et al. (2005), *funds of knowledge* is defined as "The belief that students all have prior learned knowledge based on their own experiences and environments. Therefore

teachers can make curriculum connections to prior student knowledge and experiences (Gonzalez et al., 2005, p. ix-x). Essentially, educators can design learning experiences to help students directly relate to the content based on their individual funds of knowledge. However, it is important to stress that educators must design their meaningful lessons in ways that will engage, motivate, and help students learn. Petkov and Rogers (2011) claim that there is a current push within education to cram in as much educational content as possible, and this is also true for video games within the classroom. Understandably, with increased pressure to procure high student achievement, educators want to make the most out of their instructional time. Petkov and Rogers (2011) argue that educators are making attempts to infuse student interests with educational content, but students do not find games crammed with educational content appealing. Without question, I agree that student engagement and motivation to complete video game tasks that only contain educational content would decrease their engagement and motivation; therefore limiting their impact within the classroom. In addition, I argue that completely removing video games from instruction and incorporating their learning principals into instruction will limit their engagement, motivation, and academic learning.

Purpose of Study

The purpose for my research is to explore how video games are utilized within an educational context currently, as well as the value that video games hold within education, if any, for teachers' instructional practice and student learning. My analysis of the current literature confirms Alexander et al.'s (2010) claim that video games can be utilized in several content areas. In addition, I refute Alexander et al.'s (2010) claim, that the utilization of learning principals from video games being implemented into the classroom, is the best approach for video game implementation currently. With this in mind, it is my hope that, with this knowledge, the

education system can implement video games better to meet student needs and improve educational practice.

Chapter 2: Methods

To answer my research questions, I first began by exploring the work of Gee (2003) and Alexander et al. (2010), to immerse myself in the video game conversation. I began with these two researchers because Gee (2003) first began the initial discussion of the potential educational value those video games possess. I then looked at the work by Alexander et al. (2010), to fully understand what it is about video games that makes them engaging and motivating for students. To recap, Alexander et al. (2010) determined that the learning principals within video games engage students which are as follows: narrative structure, “heroic” human qualities, vivid images, emotional engagement, extreme exotic events and locations, binary conflicts and structure, and role-playing. I used the search terms *video games and education*, *video gaming and education*, *video games and k-12 learning environments*. I used these terms because Alexander et al. (2010) focused on the use of electronic games in the classroom, but did not specify an age or grade level. In addition, I chose video games specifically because I wanted to show the potential value video games possess currently and expand on the work conducted by (Alexander et al., 2010). I used EBSCO Host, Google Scholar, and ERIC to help me locate articles. I also established limitations for my research selections. The limitations are as follows: 1) The relevant literature that I found had to be available as a full text document online. The reason that I wanted full text documents was so that I could analyze the entirety of the research in order to gain a greater sense of understanding for my own work. 2) Another criterion that I used for limiting my research was that the articles must be published from a scholarly, academic journal. By using my search terms, I first found 363 articles. I wanted my research to have validity and credibility and I knew that if

the work was published from a scholarly academic journal, it would be meeting a high standard within research. 3) The final criterion used to limit my search was that the studies must be from January 1, 2000 and January 1, 2015. I selected this time frame because my initial search revealed that video games within education initially were studied in the early 2000s. I also selected this time frame because I wanted to research what has been produced recently. I then began to read through my articles and start the selection process.

Phase 1:

For the first phase of data collection, I narrowed my selection to 44 articles that specifically focused on the range of kindergarten to twelfth grade. All of the 44 obtained articles met my requirement of full text and for being published in peer reviewed academic journals. I found that many of the articles I had originally collected also fit within the time range between January 1, 2000 and January 1, 2015. Before moving on in my selection process, I selected my materials based on whether or not the study was about the implementation of video games into the classroom for instruction.

Phase 2:

After my initial selection process, I conducted yet another selection process to ensure that the information used was valid and reliable. The second phase of my search process resulted in a more specific review of the information. I again read through the 44 articles I had deemed appropriate based on my first selection process. I then created two piles, one where I placed the articles I would be moving forward with and another for articles that I would be discarding due to their inability to meet my selected standards. The standards I set for this search process was, again, whether the articles were consistent in using participants from kindergarten to twelfth grade. Another standard that I established was to exclude articles not written in English, as I

initially had several studies from Spain that were written in Spanish. The final standard I used to sort my articles was whether or not the study indicated that video games had a positive or negative effect on the learning environment. At the conclusion of the selection process, I found 21 articles and I began coding the relevant literature into a framework.

Phase 3:

I utilized Feak and Swales (2009) *Telling a Research Story writing a Literature Review* to create a coding framework for the 21 articles I found. According to Feak and Swales (2009) "...to get a sense of the bigger picture, we recommend this kind of matrix, or any kind of working chart, tree diagram, or table, as a useful preparatory device" (p. 16). The "Mind Map" works as a visual aid for a scholar to organize his/her materials and was a huge help during my research process. To get a sense of the larger picture, I created my "Mind Map" (see Appendix A: Initial "Mind Map") to show my initial search process of searching for themes within the relevant literature. I started by first exploring the articles that I deemed appropriate with which to move forward. Once I read through my articles, I placed a post-it note on each and began to make piles for my articles. The sorted group piles were based on location of the article, the impact of video gaming on student learning (negative or positive), as well as the chronology of the articles. After my initial "Mind Map" process, I revised my "Mind Map" based on the lack of themes I was discovering. My revised "Mind Map" can be seen as Appendix B: Revised "Mind Map". In my revised mind map, I focused on the goal of the study, the impact on student learning, the content area, grade level of participants, and the way in which educators implemented video games into the classroom. Through these codes, I was finally able to discover three major themes within the relevant literature. My three themes are: 1) Video games have educational value in several content areas, 2) Educators consistently used the same approach for video game

implementation and experienced success, 3) There are limitations hindering the implementation of video games into the classroom; which are created by educators and a lack of adequate technology.

Chapter 3: Relevant Literature & Findings

Through my review of relevant literature on video games in education, I was able to discover three themes. The following section will contain my findings which are as follows: 1) Video games are versatile and have educational value, which justifies their utilization in core content areas of English Language Arts, science, and social studies. 2) Teachers use video games effectively, as a tool to coincide with the content being discussed within the classroom; which draws parallels to the second method Alexander et al. (2010) believes is not the most effective and needs research to answer the skepticism of fellow researchers. 3) Video games are not being widely utilized by teachers within the classroom because there are limitations technologically within schools. These limitations ultimately hinder the impact and effectiveness video games can provide to student learning. Along with these findings, I will also discuss their relevance and importance to my study.

Code 1: Video games are effective

For practicality purposes, I composed a table to represent my findings based on the review of the relevant literature. The table is my summarization of my code 1 findings and relates specifically to the information contained within the table (See Table 1) in the tables section, following my references.

Science. Video games were used to acquire skills in science classes. Marino, Israel, Beecher, and Basham (2013) conducted a study of video games and their impact within science classrooms from fourteen states, which involved 876 sixth-through ninth-grade students and

thirty-four teachers (Marino et al., 2013, p. 667). Notably, I found this study to be quite significant because it illuminated the use of video games within science classrooms and their educational value for student learning. Marino et al. (2013) showed that students had the ability to conduct scientific inquiry-based learning with a video game called *River City*. *River City* required students to interact with virtual residents of a city, insects, and digital objects (in a nineteenth century city subjected to the effects of pollution) in order to figure out why they were becoming ill (Marino et al., 2013, p. 667). The use of *River City* allowed students the opportunity to determine the cause of pollution, as well as devise a solution to improve the environment for the city. Essentially, students learned about the causes and effects of pollution through the immersion of course content into the curriculum. Marino et al. (2013) reports that “Students during pre and post game interviews displayed increased language use, vocabulary, and knowledge about lakes”. This was quite eye opening because it concretely reinforced the idea that the accessibility to the content was easier for students to learn and interact with, as well as that video games were used to reinforce large concepts and not just skills.

In another study, Gaydos and Squire (2012) piloted a science video game in a middle-school classroom with 21 adolescent students through a four day observational study, prior to implementing *Citizen Science* as a two to four week curriculum. Gaydos and Squire’s results (2012) proved similar to Marino (2013). *Citizen Science* is a video game that creates players as fourteen year old girls, whom discover the impact of lake pollution through time travel. Based upon player interactions and observations of information provided by the game, players travel to the future and attempt to convince legislators of the impact humans have on the environment (Gaydos & Squire, 2012, p. 826-827). According to Gaydos (2012), students immediately began playing the game *Citizen Science*, in which students developed an increased interest in science,

and they acquired a more sophisticated understanding of watersheds produced by farms. Students were gaining access to core content in ways that boosted their interest and engagement. In addition, students were able to connect with the material in ways that traditional teaching would not be able to with the use of a textbook. Students were exploring larger concepts and themes such as watersheds, not necessarily skill-and-drilling information. In addition, students were benefitting from the education value within video games to improve their conceptual understanding of academic skills and concept. With this finding, I continued to immerse myself deeper in other academic areas. Video games use within English-Language Arts proved to be similar and equally beneficial to student learning as the research suggests within the field of Science.

English Language Arts. Lacasa, Martinez, and Mendez (2008) introduced Laura Croft, “*Tomb Raider*” into an English-Language Arts classroom to help students develop their understanding of narrative writing. “*Tomb Raider*” is an action-adventure game, where students play as a woman, who attempts to defeat villains (Lacasa et al., 2008, p. 86). The study focused on a Spanish classroom with twenty-one students in their third year of primary school (8-9 years of age) through seven two hour sessions (Lacasa et al., 2008, p. 90). Throughout the study, I repeatedly noted that the use of video games within the classroom would be used to explore large concepts and themes within the content, not necessarily to practice skills of grammar and punctuation. The children had the task of playing Lara Croft, conducting an oral retelling of the video game’s main story, writing and performing a play retelling the game, and finally producing a website (Lacasa et al., 2008, p. 90). The instructor used video games to draw comparisons to the content that they had previously discussed in class. In this sense, it became apparent that video games would not replace the teaching of core content, but could be used as a tool to

reinforce concepts and skills. The researchers also found the children learned to communicate through various multimodal forms of literacy which highlighted the goal of narrative writing (Lacasa, et al., 2008, p. 201-104). This finding is significant because not only are video games being used to explore concepts and skills, but they are also being used to help students connect in different forms of expression; which is an essential skill in the expanding technological society we are turning into. Again, through the research, video games have shown to have significant educational value and an impact on student learning.

Mats Wiklund and Love Ekenberg (2009) created a two year study designed to follow and reach twenty-one Swedish students (whom struggled in mathematics and English) through an experimental approach by using several computer video games during the project. Ultimately, I focused on how the games would be used within the classroom and whether they drew comparisons to my previous findings. Video games were being used to explore large concepts and stimulate discussion rather than the acquisition of skills. Wiklund and Ekenberg (2009) gleaned that, twenty students felt that they increased their knowledge and acquisition of the English language by playing *World of Warcraft*. Based on the results, students felt that they were able to increase their knowledge and use of the English language, which undoubtedly would reinforce skills in the use of grammar and punctuation, but also its role within the concepts and themes of *World of Warcraft*. Consistently, I saw the same results through science, and English Language Arts, but I needed to confirm these findings within the field of social studies.

Social Studies. Foster (2011) conducted a study that explored the use of video games in social studies with 39 eleven-year-old American children, who were exposed to seven hours of video game play a week for seven weeks. Although, this study was not longitudinal, I felt that the results would still have validity because of the intensity, in which students were exposed during

the course of the seven week study. Foster (2011) revealed that students learned microeconomic principles from the game *RCT3* such as opportunity cost, supply and demand, as well as scarcity. *RCT3* is a simulation strategy game where students are given money to design and manage theme parks; that features eighteen different scenarios including but not limited to titles such as: *Vanilla Hills, Golf Rush, Checkered Flags, Box Office, Fright Night, and Go with the Flow* (Foster, 2011, p. 10). I noticed that the acquisition of concepts was the focus within the classroom and how video games were being used. Not only were student interests being met, but students with no prior experience in these themes had success and enjoyed their learning opportunity.

In a similar study conducted by Pagnotti and Russell (2012) revealed similar results in economics with a ninth-grade world history class. Pagnotti and Russell (2012) utilized the game *Civilization IV*, in which students were permitted to create and develop a flourishing civilization. *Civilization IV* provides students the opportunity to focus on the development of humans with the influence of technology, as well as economic principles of scarcity, and the distribution of goods and services (Pagnotti & Russell, 2012, p. 3). The students were quite successful and made connections that they never believed video games could be used to teach, let alone learn from (Pagnotti & Russell, 2012, p. 6-7). Therefore, the use of video games was again a tool to reinforce skills or large concepts within the academic curriculum. Furthermore, students were able to make connections from the experiences within the video game to the academic curriculum.

In summary, it became increasingly apparent that the versatility of video games within the classroom was vast. In addition, video games were utilized in every major content area to an extent to help improve student learning. The learning that took place improved student skills and

conceptual understanding. It is important to note that in the fields of science, social studies, and English-Language Arts the focus was specifically tied to large concepts and themes, not rote skills. Ultimately, I discovered that the use of video games based on my review of the current relevant literature, suggests that video games do have educational value and can be utilized in every several content areas. In addition, through my review, I noticed similarities in the way that teachers were implementing video games to coincide with their curriculum. Therefore, I questioned that if educators recognized an issue in their implementation of video games, there should be different ways in which the teachers approached using video games in their classroom. Ultimately, a diverse use of approaches would suggest that there is no one method that works effectively and there would be growing need amongst educators within the studies for a better method; perhaps a learning principles approach that (Alexander et al., 2010) suggests.

Code 2: Teacher utilization of video games

To reiterate, Alexander et al. (2010) proposed that there are several methods for implementing video games into the classroom. These methods are as follows: 1) Electronic games possess educational value and by having players interact with them they are engaged in significant learning, 2) Video games do not possess initial educational value, but content can be interwoven through instruction 3) Video games are used as a simulation and have a direct tie to the curriculum Alexander et al. (2010). To be very clear, these mentioned approaches to content implementation were deemed to not be effective due to a lack of evidence by (Alexander et al., 2010). However, through my review or relevant literature, I discovered that every teacher that implemented video games into their classroom through the above mentioned approaches experienced successful accomplishment of academic tasks (Marino et al., 2013; Gaydos & Squire, 2012; Lacasa et al., 2008; Wiklund & Ekenberg, 2009; Foster, 2011; Pagnotti & Russell,

2012). I believe that significant student learning took place and therefore further proves the educational value video games possess and the potential they hold for student learning. It should be noted that the approaches used by the educators in these studies specifically relied on approaches 2 and 3. I insist that the use of methods 2 and 3 appear most logical because it makes it easier for the educator to connect the material and the experiences within video games to the curriculum. For example, if an educator was to place a video game in front of a student that had connections to the curriculum, it may be difficult for the student to make the connections the educators' may desire in order to proceed with the lesson and achieve academic success because there is no clear direction. Another problem with the first method, is that it would make it increasingly difficult to differentiate to each student based on their individual needs because some students may make connections, where others may not. Upon reflection, I began to question why there were not more educators using video games within their classrooms. There are studies that prove video games have educational value and there are resources available that suggest the best method for implementing video games into the classroom, but still there is a lack of use of video games in k-12 classroom instruction, but why?

Code 3: Limitations on video game implementation

In an article, Rice (2007) claims that educators are limited when they use video games because they do not have the technology to support video games within the classroom. Rice (2007) continues by adding that although 99 percent of teachers have access to computers, individual one-to-one student ratios to computers are not close to the same ratio. I agree that students do not have the access to computers because my experience within rural and suburban school districts is that students often share computers. There is always a battle between classrooms to sign out a computer lab or laptop cart. Considering that computers are arguably the

easiest way to implement video games into the classroom, without students having access to them would make implementation quite difficult. Rice (2007) emphasizes that many of today's advanced games require newer technology and specifically require more RAM in order to operate than what the older operating systems within the classroom can tolerate. This is significant because as our society and technology continue to advance and make improvement, our school systems must be able to as well. Our school systems are falling behind in the opportunities we offer our students, which they otherwise have experience with outside school walls. To add to this concept, Leonard Anneeta, Cheng, and Holmes (2010) confirms that schools have limitations in technology specifically with RAM, the processors, as well as graphics cards in his research of video games used in a high school biology class.

Another limitation to video games in the classroom rests at the feet of educators. Based on this information and the success of the studies previously discussed, video games were most effective when used to reinforce previously learned material, not teach it entirely. Apperley (2010) suggests that ultimately, educators do find video games educational; however, they are calling for assistance to support the meaning(s) and experiences that occur within video games and how to better connect these meaning(s) and experiences to their students understanding academically. This is significant because it confirms that educators do find value in the use of video games to increase student learning and engagement within the classroom.

It is very important to take these limitations into consideration. Not only are educators acknowledging that video games are beneficial to their students and their educational opportunities, but they are asking for support in interpreting the meaning(s) and experiences that video games produce and how to connect them to their students. It is also quite disturbing that the future generations of children who use technology heavily outside of schools are limited

because our education system does not have the capability to keep up with the changes of society. In order to provide our students with the best possible education, we must continue to adapt our school systems to accommodate the growing demands of society, as well as the students we teach.

After my review of the relevant literature on video gaming in education, it became apparent that educators are looking for answers to help them connect the meaning(s) and experiences that are produced by video games to the curriculum, in order to increase student acquisition of skills, concepts, and themes. According to David Herrero (2014) “Teachers are responsible for the successful implementation of video games into their classrooms”. Herrero surely is right that teachers are already responsible for the learning experiences within the classroom, however through recent studies, educators are asking for assistance in how to help make connections between the experiences that occur within video games to the academic understanding that our students take away from interacting with them.

On the other hand, Hsu and Wang (2010) argues, “To effectively transfer learners’ motivation from playing to learning, teachers must repeatedly play a given game and design rigorous learning activities that correspond to the game. My own view is that the best way to feel comfortable about the implementation of video games in the curriculum would be through trial and error on our own part. Teachers need to be familiar with the content they use in the classroom, which is no different than reading a novel or story to make sure that it will connect with the learning experience you are creating for your students.

Based on the review of literature, it has become incredibly apparent that there is not a clear consensus as to what the most effective way for merging the meaning and experiences within video games to the academic content. Researchers currently believe that in order for video games to be utilized effectively and efficiently within the classroom, teachers must be familiar

with the material and must utilize it according to the needs of their content and students. In addition, there is a need for continued research in the area of video games within education. Video games have proven to be effective within the classroom across multiple content areas and are utilized by educators in different capacities, but there is a need for continued efforts to determine what specifically makes video game use by educators within classrooms successful. Only after this research can researchers and educators alike begin to formulate a model to help future educators connect the learning experiences within games to the academic content.

Chapter 4: Conclusions and Implications

My research began with the initial question, how can video games be utilized in an educational context? Based on my immersion in relevant literature, two sub-questions emerged within the research process which continued to guide my research to its completion. The two sub-questions were as follows: 1) To what extent (if at all) do educators believe video games serve an educational purpose? 2) What value, if any, do video games hold for student learning?

Video games have great potential within the classroom

Ultimately, it became apparent that video games overwhelmingly can be influential within the classroom. In addition, video games have the unique ability to be utilized in academic content areas such as English Language Arts, science, and social studies. In every study, video games revealed that students had higher levels of engagement and motivation, as well as the acquisition and application of conceptual understanding. More importantly, through the review of relevant literature, video games consistently showed their educational value with empirical evidence.

How should we use video games?

Through my study of video games within education, it became clear that educators do see the value of learning that can take place with the development or use of video games within the classroom. Educators consistently implemented video games in ways that explicitly resembled Alexander et al.'s (2010) approaches. Educators found video games extremely helpful, in that they were able to reach students who normally are more reserved and less outspoken during instructional periods. In addition, educators would like to implement video games more; however, they struggle to make sense of how they can be used to meet specific content standards. Furthermore, the lack of knowledge that educators have about video games hinders their abilities to see the true potential and how they can be used more efficiently within their classrooms. Based on this, I feel that is why many educators who have yet to make attempts to incorporate video games want a clear consensus as to what the best way to use video games is within their classroom, so their students get the maximum benefit from their instruction. As a teacher, I can resonate with this feeling because we never place a student in an uncomfortable position academically, that we feel they cannot achieve. If we do strive to have them accomplish something difficult, we are there to guide them through the process. At this point, educators must take responsibility and meet their twenty-first century students halfway. I encourage educators to read up on upcoming video games and to experience them firsthand. At the very least, we as teachers can become more familiar with the culture that is shaping our classroom and society. The worst that will happen is that you just might find yourself making the transition to become a “gamer”.

Student needs can be met, but face road blocks

The implementation of video games in the classroom consistently received positive feedback from students; and why not? The student got to play video games; and while educators

may continue to remain skeptical, real learning took place. It is no secret that a majority of educators have negative perceptions of video games, thinking that they only promote violence and less than-desired-behaviors. It should be noted that many of the games that were used by educators within the classroom consistently were chosen primarily for their lack of gore. Instead, many of the teachers focused on games that they knew would have rewarding experiences for their students. Through these rewarding experiences, students were motivated and engaged in the core content they received in English Language Arts, science, and social studies. Video games were used to reinforce the skills, concepts, and themes being covered in each of the core content fields and met the needs of every student. Students today do not always respond to the traditional teaching styles and methods that educators have long become accustomed to. In large part, complacent educators are returning to their old ways and practices to achieve results, during times of great scrutiny due to test results and student achievement. Video game utilization within the classroom allows students to make personal connections from their own prior experiences of *funds of knowledge* to their learning experiences within the classroom. As a result, I believe we will see less reluctant students, ones who are eager to learn and share their knowledge with us.

Implications for My Teaching

Within my classroom, I use video games as a way to motivate my students. I currently teach in a 6:1:1 self-contained special education classroom, in which I have students who are reluctant and anxious when it comes to new content and material. However, many of my students express interests in video games and the experiences they have playing them recreationally. Naturally, I implore my students to talk to me about their accomplishments and achievements, because I know the satisfaction that comes from success in video game playing. I unfortunately find myself as a teacher, apprehensive at times to implement video games into the classroom. It

is not that I cannot or do not believe video games would ever be beneficial; it comes back to a comfort issue and wanting to ensure my students receive the best instruction I can provide. As previously stated, many teachers are anxious and frustrated as the demands for higher student achievement, tougher evaluations, and testing of our students increase. Ultimately, I am judged on how my students achieve due to the requirements that our state holds. For my teaching practice, I will become a pioneer for the field of education. Despite my own worries and frustration, my students come first and require the utmost of my attention--not a state test or an evaluation. Therefore, I will make more attempts within my classroom to allow my students to utilize video games and ultimately reinforce key skills, as well as conceptual understanding in all academic areas. My classroom is fortunate enough to have individual student laptops and Ipads, with which students can access video games that have been pre-approved.

Recommendations for Future Research

Undoubtedly, not all educators share the same passion for video game, as I do. I understand that video gaming is not a hobby that everyone has, however video games can be utilized as an additional classroom tool. A recommendation that I have is that there continues to be more research conducted around the use of video games within the classroom. More specifically, I believe that educational research should focus on the work of educators within their classroom and the success they have with the use of video games to coincide with their instruction. With this knowledge, I believe that it would be possible to discern an effective teaching method. With an effective model, I feel that more educators would feel comfortable using video games within their classrooms and how they could align to the educational standards.

Final Thoughts

In closing, I commend the work conducted by education researchers in their efforts to illuminate the use of video games within the classroom. Based on the work of the theoretical thinkers and researchers alike, we have made major strides in our efforts to support the interests and needs of all students, including the twenty-first century learner within the classroom.

However, based on my research there continues to be a need for further work to be conducted in order to help our educators feel prepared and confident in their efforts everyday within the classroom.

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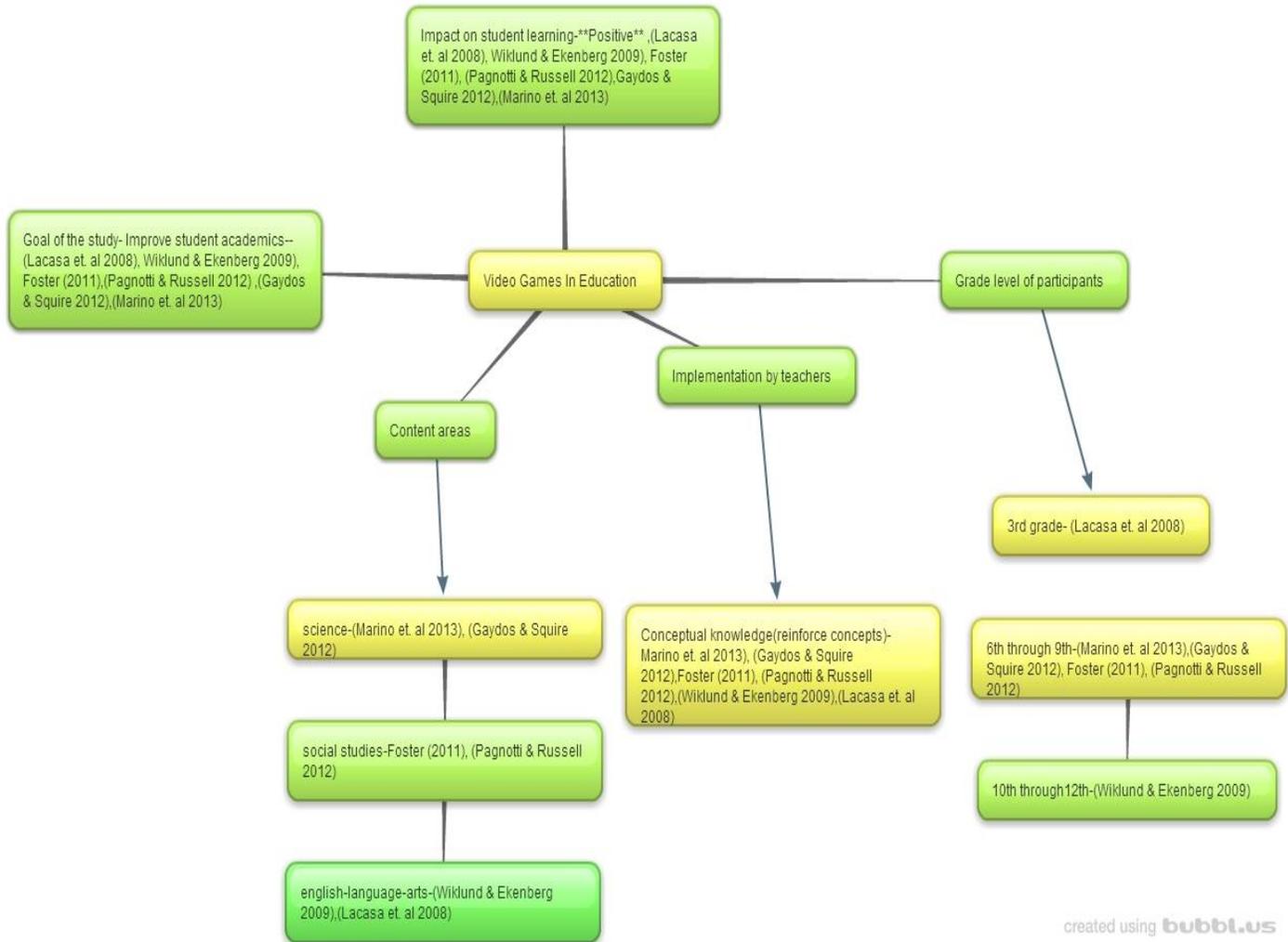
Appendix A

Initial “Mind Map”



Appendix B

Revised “Mind Map”



Tables

Table 1

Content areas and findings

Content Area	Effect positive or negative	Focus	Finding
Science (Marino et al., 2013)	Positive	Acquisition of concepts of pollution and its impact on the environment	Students during pre and post game interviews displayed increased language use, vocabulary, and knowledge about lakes.
Science (Gaydos & Squire 2012)	Positive	Acquisition of concepts such as watersheds and its impact on the environment	Student demonstrated an increased interest in science and their knowledge of watersheds.
English Language Arts (Lacasa et al., 2008)	Positive	Acquisition of concepts such as main idea, the development of character, as well as the components of narrative writing.	Students learned multiple ways of talking, acting, writing, understanding and producing images, as well as created narratives into scripts. Students also produced websites.
English-Language Arts (Wiklund & Ekenberg 2009)	Positive	Acquisition of English languages specifically relating to grammar and punctuation and the role it played within the game World Of Warcraft	Students were able to increase their knowledge and use of the English language, in terms of grammar and punctuation, but also its role within the concepts and themes of World of Warcraft.
Social Studies (Foster, 2011)	Positive	Acquisition of concepts specifically related to scarcity, supply and demand, as well as goods and services.	Students showed increased acquisition of concepts based on pre and post test questions.
Social Studies (Pagnotti &	Positive	Students created and developed a flourishing	Students demonstrated an increased

Russell 2012)		civilization, while focusing on the development of humans with the influence of technology.	understanding of scarcity, and the distribution of goods and services.
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Note: These are the findings from seven studies, which displays how video games were used across multiple content areas, the effect on student learning, as well as the findings that I discuss.

Table 2

Teacher implementation of video games

Content Area	Video game implementation	Finding
Science (Marino et al., 2013)	Teachers used video games to explore the effects of pollution on the environment.	Teachers utilized video games to interweave the content being studied to reinforce student understanding.
Science (Gaydos & Squire 2012)	Teachers used video games to explore the effects of watersheds.	Teachers utilized video games to interweave content being studied to reinforce student understanding of watersheds.
English Language Arts (Lacasa, et al., 2008)	Teachers used Laura Croft "Tomb Raider" to explore the traits of narrative writing and character development.	Teachers utilized video games to interweave content being studied and allowed students to create and design their own narratives, as well as classroom website to demonstrate their understanding.
English-Language Arts (Wiklund & Ekenberg 2009)	Teachers used World Of Warcraft to explore the English language; closely studying grammar and punctuation use.	Teachers used video games to explore the use of grammar and punctuation within video games and how they impact the storyline within World Of Warcraft. Again, teachers interwove the content with video games to reinforce student understanding.
Social Studies (Foster, 2011)	Teachers used video games to have students create and maintain theme parks	Teachers gave students the freedom to create and design theme parks. Students explored the concepts of supply and demand, as well as scarcity.
Social Studies (Pagnotti & Russell 2012)	Teachers used video games to have students create and maintain individual civilizations.	Teachers gave students the freedom to create and design theme parks. Students explored the concepts of supply and demand, as well as scarcity.

Note: These are the findings from seven studies, which displays how video games were implemented similarly by educators across multiple content areas. My finding suggests that teachers are effectively implementing video games within their classroom now and approach of

interweaving the curriculum into the video game experiences, should be utilized by future educators.

Table 3

Limitations affecting the implementation of video games

Resource	Finding
Rice (2007)	99 percent of classroom teachers have computer access, however student to computer ratios are not similar to that of teachers. In addition, the computer systems within schools do not have the capability to keep up with current video games because of a lack of RAM.
(Anneeta et al. 2010)	Confirms that computer systems within schools lack in their RAM capabilities, as well as graphic cards needed.
Apperley (2010)	Suggests that educators do find video games to hold educational value to student learning, but claims that educators struggle on how to bridge the meaningful experiences that occur within games to individual student understanding of the content.
(Herrero et al. 2014)	Suggests that it is up to teachers to create meaningful experiences within their classroom. Based on this claim educators do find educational value within video games and want to use them, but are unsure on the best way to bridge to students.
(Hsu & Wang 2010)	Suggests that the best way for educators to create meaningful lessons that incorporate video games, they must repeatedly try them within the classroom. From repeated use and making educators familiar with certain video games, they will feel more comfortable utilizing video games into the classroom and their lessons will become stronger.

Note: These are the findings from 5 articles, which displays how video game implementation is being hindered from utilization within classrooms by educators. Although the use of video games within the classroom is a new topic of discussion, the relevant literature suggests that a lack of implementation by educators is due to the lack of capable technology within the classroom, as well as educators' unfamiliarity with video games and how to connect the experiences in them to student learning.