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Video Games: Exploring the Impact of New Age Products on the Future of Education

Abstract

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Video Games: Exploring the Impact of New Age Products on the Future of Education

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Video Games: Exploring the Impact of New Age Products on the Future of Education

As the new technologies are invented and introduced in our society, we begin to change the ways in which we communicate, work, and function. Advancements in technology are nothing new to our society. What is new, however, is the accessibility of these new age products. From the ease of which people are now able to gain access to smart phones, video games, and the Internet among many other technological wonders, a new breed of student has surfaced – a generation immersed in a media-rich, "always connected" world; reliant on 21st century skills. This demand as well as other like societal shifts parallel educational changes. In his address at the National Educational Summit on High Schools, Bill Gates (2005) asserted that, "Training the work force of tomorrow with the high schools of today is like trying to teach kids about today's computers on a 50-year-old mainframe" (National Education Summit on High Schools, para. 14). While the central focus of what Gates believes is that high school education must shift in a direction to best meet their student's needs of the future in regards to finding a job and making a living, the same concept can be directly applied to the adaptation of new literacies and digital games across all levels of education.

While each of the previously mentioned technological advancements all play a significant role in society in their own right, quite undoubtedly "one of the most influential, universal, profitable form of entertainment to emerge in the past thirty years within the United States are video games" (Squire, 2003, p.1). Video games are much more than an economic phenomenon within our country; they have also helped to shape the culture of today as well. One year after Squire's initial claim of video game supremacy within American entertainment, on November 7, 2004, three major titles were released; two films (Spiderman 2 and the latest edition of Star

Wars) as well as Halo 2. On November 9, the United States celebrated the highest grossing

media day in world history to that day. Grossing $125 million in sales on the first day, Halo 2

singlehandedly set the world record and proved to be a dominant force in the entertainment

world (Squire, 2006). Since video games have become so interwoven within our society and

have such an immense effect on our culture, many educators have begun to research the

possibilities of integrating them into education.

The emergence of 21st century skills within American society has brought about new

skills necessary for student's success. The concepts that are largely responsible for the change in

opinion of video game integration are communication and collaboration. These two skills are,

for many, necessary for success in the future. Trespalacios, Chamberlin, and Gallagher (2011)

claim that "video gaming emerges as a possibility to increase these skills in our students" (p. 49).

Video games were originally overlooked as a tool for education because of the social stigma,

however, the realization for the need for educators to adapt to changing times have allowed them

to be look at video games in a new light. Because the concept of video games as a tool for

learning is relatively new, there are still many that do not believe video games play a sufficient

enough role and that while the engagement and motivation offered from the games are

interesting benefits for students, but they are not justifiable in their use for educational purposes.

Despite contradictory beliefs against video game use for educational purposes, of which

will be addressed later, there is a much larger movement toward the use of video games as an

educational tool. Over the past few years many school districts, including Riften Central School

District where a portion of this study was conducted, already incorporate a variety of computer-

based games into their school day. ReflexMath is a product of ExploreLearning, a company that

develops online games to assist students in math. For approximately 30minutes every other day,

students participate in games that have been developed to offer an "adaptive and individualized" experience for each student (http://www.reflexmath.com/about). Data is collected through the company's servers then analyzed, graphed, and relayed to the teacher. Classroom teachers can use this data to modify or better focus their instruction as to which areas are of greater need for the class as a whole or specific individual. Video games in education have, throughout recent years, begun to show a stronger presence in classrooms across the world and in the 2011 Horizon Report, a project dedicated to the charting of emerging technologies proposed the idea that expanded reality and game-based learning will gain widespread use in two to three years (Johnson, Smith, Willis, Levine, & Haywood, 2011). Teachers must therefore call attention to this and begin to educate themselves because as technology changes, it does so quickly. Teachers and districts must be prepared to meet the expectations of their students as technological advancements make way for better, more engaging video games that are capable of providing a reliable educational tool within the schools.

While there is research surrounding the educational use of video games, many researchers are not interested or concerned with examining whether or not current games offer content worthy of integrating into the classroom for educational purposes (Gros, 2007). One issue that must be addressed in making this claim is the imbalance between researchers, educators, and game developers to come to one, solid understanding of what makes a video game educational. Gros claims that researchers "still struggle for acceptance and academic credibility; there is a lack of common research language, few basic and theoretical discussions; and funding for research is scarce" (p. 24). While what Gros is claiming is indeed a significant issue, one must remember that the idea of video games as an educational tool is relatively new; progress throughout recent years in this field has provided substantial promise for the integration of video

games into the classroom. Squire (2003) recognizes the gap put forth by Gros; however, he claims that video games provoke powerful emotional reactions among individuals and are the "raw material" for the cultural youth and as instructional technologists continue their studies on video games in social contexts, they will begin to better understand the impact of technology on individuals and, in turn, be able to enhance digital learning environments (p. 2). Refining the learning environments found in games will be accomplished once game developers come to the understanding that the dynamics of which make video games so popular (character traits, objectives, rewards, collaboration with others, etc.) and be able to utilize them into their design of interactive digital media.

In this study, I examine research on the effectiveness of video game integration within the classroom as well as research gathered from various theoretical interpretations with the common purpose to expose the ability of video games and simulators to facilitate learning. The purpose being to not only discover the motivating factors video games can play in the classroom (engagement/on-task behavior), but also how certain games are able to support the learning and teaching of curriculum content. In addition games reinforce the differentiated learning styles that support school based learning. While there is significant theoretical evidence to support the use of digital games in learning and education, the empirical evidence to support the idea is varied. Using both theoretical and empirical evidence, the research conducted in this study will divulge three key claims about the educational use of digital games. The claims are that digital games create an engaging learning environment, teach 21st Century Skills, and that digital games are built on sound learning principles.

This research project began by asking a classroom of fifth grade students to not only disclose their video game playing habits, but their opinions on video game integration into

schools. Secondly, six elementary teachers were asked to share their views the potential to

integrate a specific video game into their classroom after given a brief description of the game.

Both teacher and student data were compiled through questionnaires given during school hours.

The last piece of data was collected from recorded field notes taken during the observation of

three video game playing sessions using the video game *Scribblenauts*. The findings revealed

that, for the most part, both students and teachers believe that video games can potentially play a

positive role in the classroom in regards to facilitate learning. Furthermore, the evidence

collected from the actual game playing sessions showed that learning does occur, yet the degree

of which the student achieves can be based primarily on student motivation, engagement, and

familiarity with the game/controls. The data compiled in the research study implies that while

video games have the potential to supply individuals with the necessary tools to become efficient

21st century learners, there is still much to be done with regards to educating teachers on ways to

implement the games as a learning tool. Furthermore, there is a significant gap between where

researchers, educators, and video game developers stand if video games ever want to have a

place within the curriculum of education.

Theoretical Framework

It is important that, before beginning the complex process of analyzing the effectiveness

of simulations and digital games on a student's literacy achievement, I first put forth my

definition of literacy. I define literacy as a socially constructed, evolving process, which

includes proficiency with skills necessary to navigate through the society of which we live in.

Freebody and Luke (1990) define literacy as:

> a multifaceted set of social practices with a material technology, entailing code
>
> breaking, participation with knowledge of text, social uses of text, and an analysis

of the text. In order for learners to be in a position to decide where, when, or how

they want to deploy the technology, and be able to draw upon a range of strategic

uses of print, all of these aspects are required. (p.15)

Furthermore, Freebody and Luke (1990) argue that:

Literacy success can be documented; everything that a member of our culture can

take or bring to a written text can never be pre-specified, any more than

everything that a culture demands or expects from its members in dealing with

written text. (p.7)

Literacy is not an individual act or process, rather a set of social practices undertaken with

others. Students must know what to do with text in particular social context other than those sited

in the classroom (Freebody & Luke, 1990). Additionally, it must be understood that literacy

cannot be taught in the same manner across various environments; the specific circumstances

and the selection of learners must be taken into consideration.

In order to guide the research and synthesis of data, this study was led by the theory of

new literacies. According to Lankshear and Knobel (2007), "technological literacies may be

defined as social practices in which texts are constructed, transmitted, received, modified, shared

and otherwise engaged within processes employing codes which are digitized primarily, though

not exclusively, by means of (micro) computers" (p. 225). The new literacy perspective helps us

recognize literacy as a tool for maintaining social relationships in everyday interactions between

people in both formal and informal settings.

The emergence of new literacies, which are typically new forms of literacy made possible

by digital technology developments, in recent years has sparked new controversy amidst the

ever-changing field of educational. The New London Group (1996) called for a broadened understanding of literacy across our society due to the "variety of text forms associated with information and multimedia technologies" (p. 61). As our society changes, so too should the ways in which educators instruct students; it is important for teachers to understand the importance of technology as it is altering the way students acquire literacy whether they like it or not. Gee (2000) claims that reading and writing, in terms of "the New Literacy Studies," is a "movement that denies that literacy is ever general or self-contained" and only make sense in our social and cultural practices (p. 412). New literacies are quintessential building blocks in developing today's 21st century learner as they help students acquire the necessary 21st century skills required to be successful. One such form of new literacies that is impacting the ways in which students acquire literacy is video games. Games are capable of fostering collaboration, problem-solving, and procedural thinking all while accommodating various learning styles which allows players to acquire and practice the important 21st century skills (Johnson et al., 2011). New literacies offer the opportunity to engage and teach students in a more purposeful manner. Teachers can utilize their student's interests of new literacies to support their learning. As new technologies are developed and introduced, teachers must learn to adapt instruction to meet the needs of students who become more and more technologically savvy and dependent.

Research Question

Given the emergence of new literacies within our society and their ability to offer engaging, more purposeful education to students, this action research project asks, how can digital games be used to support reading, writing, and collaborative communication?

Literature Review

Attention must be paid towards the necessity of integrating new technologies into the classroom, specifically simulations and digital games. While there is a great deal of theoretical support for the use of these learning tools within the classroom, there is a fluctuation within the evidence to support the claims. This review will provide a synopsis for both sides and make a claim that the benefits of including simulators and digital games in the classroom provide a much greater benefit to the students than neglecting the notion altogether. In the following synthesis of research articles and studies, this review will explore three themes about the use of digital games in education. The themes are that digital games (1) create a stimulating and engaging learning environment, (2) teach 21st century skills, and (3) are built on sound learning principles.

Creates an Engaging Learning Environment

Recently, video games have played an important role in the lives of children and adolescents (Gros, 2007). There are many reasons that these types of games are such a popular and influential medium. Squire (2003) asserts that video games "elicit powerful emotional reactions in their players, such as fear, power, aggression, wonder, or joy" (p.3). The objectives, character traits, difficulty, and story are often what generate these emotions; they are what draw the gamer in. Additionally, video games also increase student motivation by providing clear goals, direct and immediate feedback, balance between ability level and challenge, and a sense of control; these components increase engagement and engagement correlates to student achievement (Shute, Ventura, Bauer, & Zapata-Rivera, 2009). For many, daily routines of reading, writing, math, and other text-based studies are labeled as tedious and grueling.

Curriculum often lacks a motivating and engaging environment to uphold student interest. Teachers have long since used numerous strategies to motivate their students, all with varying degrees of success. Cirnu, Militaru, and Stefan (2012) claim that video games create an emotional involvement that "creates a bridge between the topic and the student for longer-lasting impression" (p.321). This emotional involvement thus creates a stronger memory as the user in invested in the gameplay and story. Whereas, if a character in a story is presented in an uninteresting way to the student, they will likely soon be forgotten. Squire (2003) argues that one area educators have ignored is the cognitive potential of games and claims that contemporary developments in gaming, specifically "interactive stories, digital authoring tools, and collaborative worlds, suggest powerful new opportunities for educational media" (p. 2). In other words, what Squire is claiming, is that recent technological advancements have opened doors for modern game developers to create games that are capable of being utilized as educational tools. While the idea could prove to be logical, Gros (2011) suggests that these same developers are not concerned with the accuracy of the content within their games and often add inconsistent or erroneous content to the gameplay. Teachers and educators should be made aware of this potential problem as it could very well contradict what the concepts the students were supposed to be learning about in the first place.

For many students, especially struggling readers, to make advancements in literacy today, Guthrie and Humenick (2004) claim that teachers, in order to increase the impact of reading comprehension, "instruction must be motivational and better unite the students' technology and literacy worlds" (p. 12). Because a student's world is already surrounded by technology outside of the classroom, his/her engagement in literacy activities will increase as the amount of technology utilized in the class increases. Furthermore, when teachers incorporate technology in

to their lessons, it "allows them (students) to take the instructional lead in the classroom" (p. 12).

Teachers and administrators must begin to push new, technological literacies, and yield old, traditional literacy instruction.

In an attempt to find answers to the growing speculation of why boys are not progressing as much as girls in terms of literacy acquisition, Sanford and Madill (2007) completed an examination in which they studied a range of multi-literacy activities of a selection of adolescent boys. Through questioning and observation, focusing mainly on video game play, Sanford and Madill were able to gain an understanding of what the boys learn through their engagement with non-traditional texts. Through these observations and conversations with adolescent boys, they found that "significant, powerful learning is occurring through video game play and creation" (p. 2). While this study is one of the few large-scale quantitative studies to have been conducted on video game motivation and engagement, it certainly sheds light on some key components that advocates of video game integration depend on. Steinkuehler (2010) would claim that Sanford and Madill's findings are due to the ability of video games to truly test what many males are capable of since they are an interest for them. Furthermore, video games are capable of igniting a passion in many students like no other. However, when considering the potential use of digital games in education, it is important not to mistake a student's interest for ability. Steinkuehler (2010) claims that "it is easy to feel a certain disdain for video games when you consider their violent themes, their scantily clad and ludicrous depictions of women, scatological humor and the hyper-masculine discourse that surrounds them" (p. 63). Steinkuehler asserts that it can be argued that English has increasingly become a female domain and that video games are often referred to as male territory. Therefore, when male students are judged based on their competency to read and write, educators often base the student's performance on what they, as

educators deem important or interesting. However the issue that arises is that these topics are not

always the ones the male student finds interesting. There is potential for a serious disconnect in

this scenario as, with the data gathered, the students "interests" are measured, not their actual

"abilities" (p. 63). While the notion of motivation in this scenario is intriguing and thought-

provoking it is important to, when questioning the motivation of students in school, analyze the

actual perceptions the individuals carry regarding the use of video games in the classroom.

As the debate surrounding the promise of digital games as a 21st century teaching tool

evolves, one of the main arguments for the integration of games is that they are appealing to

today's students and are easy to use. However, critics suggest that video games, as a form of

digital-age technology, should not be presupposing. According to Bourgonjon, Valcke, Soetaert,

and Schellens (2009), critics claim that the integration of technology should be questioned as the

use of media among students is believed to be solely for communicating with friends, create their

own place in society, and to relax. Therefore, it is with this thought that some believe the

benefits of video game integration into technology are slightly exaggerated. In an attempt to

gain a better understanding of the actual perceptions of students, Bourgonjon, Valcke, Soetaert,

and Schellens conducted a study in which they provided a model to predict and examine the

acceptance of video games among 858 secondary school students. Among many findings, it was

concluded that students in the study appeared to shows atypical signs of acceptance than

previous video game research on the usefulness of video games. According to the data,

"different predictions of acceptance emerged when games are used for different purposes (e.g.

for education instead of fun)" (p. 1151). The findings, though contradictory to popular belief,

are important because they may confirm the idea that students should not be thought of as one

uniform group; educators must keep in mind gender differences and prior exposure to video

games. While those that advocate the integration of video games must keep in mind the acceptance of the games as viewed by the children, they must also consider how the game will fit into the teacher's day-to-day class. A study conducted by McFarlane, Sparrowhawk, and Heald (2002) sought teacher opinion regarding the potential for video games and simulation to be used in the acquisition of knowledge in primary and secondary classrooms. For the most part, teachers had very positive views of video games and simulations. However, teachers in secondary education stressed the difficulty of which they would be able to incorporate the games in to their daily schedule. Increasing curriculum demands pressure many teachers to focus on the time constraints and the need to cover the entire curriculum. For these teachers there is, in essence, no time to incorporate videogames, no matter how beneficial they view them. Thus, these studies serve as a starting point as researchers further investigate the potential for video game integration. When incorporating digital games into the curriculum, one should not just assume that all students and teachers will benefit and accept these digital learning tools equally.

Teaches 21st Century Skills

As digital technologies become increasingly interwoven throughout the lives of people, games play a significant role; Thus, changing individuals thought patterns and information processing (Cirnu, Militaru & Stefan, 2012, p.319). In addition to societies evolving and fluctuating demands, which have called for the acquisition of 21st century skills, so too have the demands of curriculums across the nation changed. With the introduction of the Common Core Standards across the country, demands have been made on teachers and students like never before. One such demand is the institutionalization of digital assessments in the year 2014 (Lenovo Education, 2012). This dramatic shift in testing, while drastic, only further strengthens the argument for students to learn 21st century skills. If a student is unable to read, write, or

generally navigate the testing device, their testing scores will be ultimately hindered. If this holds true, further implications may arise throughout our society. Individuals within communities that are able to access the necessary technology (white, middle class) will succeed, while minority groups within a community feel the effects of the absence of technology in the classroom.

        In order for students to become successful, they must develop and acquire a certain set of skills that will help them be successful in the future (Cirnu, Militaru, Stefan, 2012). Educators and researchers should look to the pattern of change throughout recent years and begin to design curriculum that will focus student learning towards skills and concepts they will need in the future (i.e. typing and other digital communications). The significant influx of digital technologies over that past thirty years has forced a societal shift from the age of industry to that of information and has caused a change in the ways in which people communicate, retrieve information, and learn (Luterbach & Brown, 2011). Due to tremendous societal shift, many organizations have begun to develop new frameworks to outline specific skills necessary to be successful in the 21st century. The Partnership of 21st Century Skills is a national organization that advocates for the 21st century readiness of all students who assert that critical thinking, problem solving, communication and collaboration are the building blocks of 21st century success (Partnership, 2009). It is evident here that a monumental shift has taken place away from the traditional foundations in education of reading, writing, and arithmetic. While still necessary and incorporated into the new-age definition of educational success in the 21st century, the Three R's will simply not suffice. Likewise, enGauge 21st Century Skills Framework, which was developed by the North Central Regional Educational Laboratory (NCREL), argues that the most applicable skills for the 21st century are "digital-age literacy, inventive thinking, effective

communication (teaming/collaboration), and high productivity (Trespalacios, Chamberlin, & Gallagher, 2011). While both organizations fluctuate in the precise terminology to construct their respective frameworks, it can be determined that both stress the necessity for communication and collaboration in order to be successful in the 21st century. To further accentuate the importance of communication and collaboration, in an update to the revision of Bloom's Taxonomy, Churches (2009) argues that "collaboration is not a 21st century skill, it is a 21st century essential" (p.8). Now that it is clear which proficiencies an individual must possess, researches and educators must now ask how they can motivate students to work and learn in a collaborative manner, thus enhancing communication.

According to Cirnu, Militaru and Stefan (2012), in regards to today's youth, the skills necessary for a successful future "depend on challenging economic situations, advancements in technology, virtual team and international projects (p.20). Whereas previous definitions of 21st century skills laid out concrete objectives for a successful future, Cirnu, Militaru and Stefan insinuate that the skills required to be successful have the potential to fluctuate given society's condition. There is also an emphasis placed on the need to acquire skills necessary for multi-national communication. It is evident that with each advancement in technology, the corners of the world become closer, thus requiring the need to be competent in communicating across borders. Guillen-Nieto and Aleson-Carbonell (2011) hypothesize that interactive learning environments provided by video games may contribute and enhance an individual's intercultural communicative competence. The game used in this instance was *It's a Deal!*, a game designed for the sole purpose of developing the intercultural communicative competence of business students across nations with English as its primary language. Using 108 students from both Spain and Britain, the study attempts to answer three main questions: First, did the students

surveyed improve their intercultural awareness and communicative competence? Secondly, did the students improve their intercultural learning? Lastly, if there was no improvement on their learning, what factors contributed to the failure? The study concluded that this particular video game was indeed an effective learning tool for teaching intercultural communication between the two nations. Specifically the data shows that while the game had minimal effect on intercultural awareness, it did show a reasonable effect on participant's intercultural knowledge and a significant effect on intercultural communicative competence. Credit for the study's success is attributed to the aspects of *It's a Deal!* which directly correlate to the same dynamics of other video games that make them a beneficial learning tool. Because the game was capable of offering immersive, all-embracing content, educational content, clear pedagogic objectives, and an interactive learning environment, participants were able to enhance their intercultural communicative competence. Because the idea of video games as educational tools is relatively new, studies to show the connection between games and educational learning are scarce. Concerning the relationship between gaming and multicultural communication, there are even fewer. Attempting to claim that video game play is a significant contributor for enhancing intercultural communication may prove to be quite difficult, at least, currently. Additional, more complex research may signify more results in terms of the benefits video games provide in enhancing cross-cultural communication.

It is necessary to understand that, as educators, these skills are becoming increasingly important within our society. Digital games are beneficial to a classroom full of learners who all acquire knowledge differently because they can accommodate a wide variety of learning styles within a complex decision-making context (Squire 2006). While these games do urge children to make complex decisions, it is not the only reason playing video games can be beneficial to the

learner. Gros (2007) asserts that beyond complex decision-making, students who play digital games are also "dividing visual attention, the skill of keeping track of a lot of different things at the same time" (p.26) and references a study that found students with a higher level of attentiveness were also higher-level gamers.

Mass media often blames the disintegration of literacy skills on video games (Solomon, 2004; Squire, 2006; Steinkuehler, 2007). These claims however, much like those that blame video games for the violence that occurs within our society, are met with strong critique. Solomon (2004), a front runner for this claim, states that not only are video games responsible for the collapse in literature, but intellectual life and civic engagement as well. The problems with this claim are that critics all too often are eager to place the blame on a generalized topic. Steinkuehler (2007) claims that one problem with this argument is that it lacks specification as to which games are the culprits of the theoretical "literacy crisis" (p.181). Video games are fundamentally interactive which means, that as an individual uses one type of video game, they may walk away from the game having learned something different or acquired a separate set of skills than another individual who played a separate genre. The second problem Steinkuehler addresses is the question of which literacy skills are the ones deemed "at risk"? (p.182). There are varying interpretations of what exactly the term literacy embodies. For instance, the National Institute of Literacy's (NIL) definition claims that literacy is "an individual's ability to read, write, speak English, compute and solve problems at levels of proficiency necessary to function on the job, in the family of the individual, and in society" (p.182). However, the definition of literacy set forth in New Literacy Studies, emphasizes not only the recognition, but production of meaning in multi-media areas fostered by digital technologies. It is clear then, when presented with the argument that gaming is suffocating literacy education, it is difficult to answer this

question without the knowledge of not only *what games* but *which literacies* are being

questioned? Like most digital media, there are a variety of different categories of which each

games falls in. One genre of video games that truly embraces many of the 21ˢᵗ century skills

required of students are Massively Multiplayer Online games (MMOs). After conducting a two

year long online study, Steinkuehler (2007) concluded that, contrary to the belief that games are

replacing texts, participation in Massively Multiplayer Online games (MMOs), is itself a literacy

activity (p. 204). Much like popular social fantasy games decades ago such as *Dungeons and*

Dragons, which required paper and pencil, new technologies have evolved the genre now take

participants out of their home and into visually pleasing, large scale fantasy worlds. While

MMOs typically follow imaginary plots and themes, they are notorious for their "escapist

fantasy" yet promise of "social realism" (Steinkuehler 2007, p.183). Using self-generated

characters or "avatars", players are given the opportunity to not only interact with the software

but other users as well. Squire (2006) asserts that "facility with written language is central in the

community as players use text to negotiate activities, enact identities, and apprentice others into

the community" (p.23). MMOs force players to work collaboratively with other uses throughout

the world in order to complete specified quests. In order to be successful in MMOs, users must

actively engage in a world that requires a variety of (typically written) social practices in which

players uncover large amounts of reading, writing, research, analysis, and argumentation. Of

course, participants must keep in mind that since collaboration is a key component of MMOs, an

individual's actions, while fictional, does carry consequences for the members involved.

Digital Games Are Built on Sound Learning Principles

The importance for video game integration across school-wide curriculum can possibly

be summarized by one student who, at the 2004 Game Developer's Conference, was quoted as

asking: "Why read about ancient Rome when I can build it?" (Squire, 2006, p.19). While this is

a thought provoking, and revolutionizing statement, because of the surge of interactive,

immersive digital games in recent years, this is the way many students think.   New game

experiences are changing the attitudes of this generation in regards to work and learning (p.19).

Technology, however, is not the only aspect within our society constantly changing and

evolving. According to Squire (2003), advancements in educational assessment, such as peer-

based assessment and performance-based assessment, "provide learners multiple sources of

feedback based on their performance in authentic contexts" (p. 3). Video games at their most

basic level are inherently assessments, in which game developers test the player's decision

making. Digital games offer a set of objectives or goals and provide immediate feedback

allowing the player to alter his or her approach to the task (Dickey, 2005). Altering one's

approach to the game's objective is a result of failure but it is because there is little to no

consequence in failing that makes digital games so appealing to students and younger children.

Well-designed games encourage players to improve through repeated trial and error, thus the

user begins to hone the required skill much like a teacher would teach, modify and reteach a

lesson after a test, except the feedback with video games is much quicker. Prior to the ongoing

assessment that takes place in video games the design of the game must also be able to draw the

user in allowing them to become fully immersed in the gameplay. One such game that does just

that is Pac-Man.

        The question of whether or not the incorporation of video games in education is feasible

has been around for decades. From the time Pac-Man was introduced in the early 1980's, some

educators have often wondered if "the magic of Pac-Man" could be harnessed and let loose

within the classrooms in order to enhance student involvement, enjoyment, and commitment

(Bowman 1982, p.14). Much of the early research conducted on analyzing the educational use of

games often provided only fundamental theoretical models of why users are engaged by these

games. Bowman attempts to gain a better understanding of the power video games have as their

capability of placing users in "flow states". According to Squire (2003) flow is the term given to

individuals that have achieved a state of optimal experience, in that, they are "so engaged in

activity that self-consciousness disappears, time becomes distorted, and people engage in

complex, goal-directed activity not for external rewards, but simply for the exhilaration of

doing" (p.2). This notion for of entering a state of uninterruptable decision making is one that

drives advocates of video games integration into education. In his concluding statements

regarding his analysis of Pac-Man players Bowman asserts that the reason video games are

inherently effective at placing users in a flow state, is that,

> It (Pac-Man) is an action system where skills and challenges are
>
> progressively balanced, goals are clear, feedback is immediate and
>
> unambiguous, and relevant stimuli. Together, this combination
>
> contributes to the formation of a flow experience for the user (p.
>
> 15).

While the relationship between Pac-Man's and the field of education and literacy are weak at

best, that is not the purpose of Bowman's study. From Pac-Man to Call of Duty, individuals that

engage in video game play are in control of their actions as they enthusiastically pursue and

complete goals and are challenged the degree of their abilities (Squire, 2003). It is important to

understand the relationship between this particular study and the ongoing research and

development of current video game integration. Bowman's (1982) framework offers insight into

the key components of video games, for both the user and actual game, which be used as the

building blocks to improve learning environments. The principles Bowman uses to promote this

notion is that educators must provide clear goals, challenge students, allow collaboration, use

criterion based assessments, give students more control over the learning process, and

incorporate novelty into the environment. These concepts are essential in a classroom as they

accelerate learning among students that may not benefit from a classroom where the teacher is

the sole facilitator.

Throughout the early stages of childhood development, one essential element all children

need is play, specifically imaginative play. Ke (2009) asserts that it is important to realize that

"given the role that play and simulation serve to intellectual development, computer games as a

vehicle for both play and simulation are not just a diversion to children, but an integral part of

their learning and social lives" (p. 3). Therefore, it is necessary to recognize the importance for

students to acquire 21st century skills and the role video game's play in acquiring said skills.

Often, educators are unaware of the important components within video games that directly

embrace literacy education. Steinkuehler (2007) labels these "constellation literacy practices" (p.

301). These practices are often not applied in the classroom or even acknowledged. Apperley

and Walsh (2012) confirm this notion that as individuals interact with digital games, there is a

direct connection between playing the game and reading print-based and multimodal texts,

frequently asked questions (FAQs), walkthroughs, cheats, and codes which are "often at grade

levels well beyond pupils' acknowledged proficiency as measured by standardized tests" (p.115).

In order to take advantage of this relatively unknown feature of digital games, teachers must be

informed and given explicit instruction on how to incorporate games in to the classroom.

Traditionally, computer games have been used in the classroom as primarily drill and practice

games; games such as *Alga-blaster, Reader Rabbit,* and *Knowledge Munchers* require students to

participate in these enrichment exercises during independent time (Squire, 2002). The problem

here is that they offer little to no engaging dynamics. Games such as *SimCity* or *Civilization*

allow students to explore the micro worlds of a society, all while gaining the same fundamentals

of math and literacy skills.

If the question then becomes can video games be used to increase motivation in an

educational setting, it is important to analyze the data collected in studies that asked the same

question. One such study was one year long and included over 500 teachers throughout Europe.

It was found that the effects of digital games in schools were believed to increase student

motivation when integrated into the classroom for educational purposes (Joyce, Gerhard, &

Derby, 2009, p.11). While this particular study appears to answer the question of the

effectiveness of video games in the classroom, many critics argue that while motivation and

engagement are interesting benefits of video game play, they are not the solution to the

educational problems in our society. Gros (2007) presents an argument that video games, while

motivating, are "often based on violent and misogynistic themes" and what individuals learn

from video games is not always desirable (p. 23). While it is important to understand that not all

video games are appropriate for all audiences, it is equally important to recognize that not all

video games are "shoot-em-up" blood baths. For instance, Pokémon, a game that has the user

train creatures with magical powers, motivates younger children to learn reading at a much

higher level than the resources offered to them at their current grade level (Bogost, 2005). In

order to play the games, children must learn to read. This type of literacy acquisition is referred

to as *learning by doing* by many in the study of educational gaming. While traditional literacy

activities that lack motivation cause the student to *not do*, the main characteristic of video games

is that they are organized around *doing* (Squire, 2006).

Given what the research tells us on the effectiveness of digital games in the classroom, there is still a lot to be said about the future involvement these types of games will have in the classroom in the future. Squire (2002) claims that one of the major obstacles facing teachers and students in the integration of digital games in schools is the "time it takes to familiarize themselves with the game before it can prove beneficial" (p. 6). Consequently, there are several implications for teachers. It is clear that, video games aside, technology is playing an integral part in our education throughout recent years. McFarlane, Sparrowhawk, and Heald (2002) claim that teachers "need confidence with the genre and imagination to integrate games into learning tasks" (p.16). Teachers must realize this and begin to take it upon themselves to familiarize themselves with new technologies to keep their material interesting and up-to-date.

School, however, is not the only setting in which children participate in playing video games; it occurs at home as well. In order to gain insight into how these games were viewed at home, TEEM's *Report on the Educational Use of Games* in which a study was done in order to explore the potential for games in the education process. The report showed that parents, despite holding traditional views on what is meant to be learned in schools, recognize the need for other specific areas of knowledge that children need to acquire, areas related to computing and gaming (McFarlane, Sparrowhawk, & Heald, 2002). While parents do recognize the necessity of their children to acquire 21st century skills, there is still a gap between what video games can offer and how parents traditionally view video games. Sanford and Madill (2007) argue that with further understanding of video games, parents and educators will be able to better guide their children or students to practice more critical forms of literacy.

A more radical approach for teachers would be in pushing for an alliance between themselves and game developers. Currently, the video game industry is, by and large, not

concerned with how, when, why, and to what end video games should serve educators (Bogost, 2005). Game developer's disinterest in integrating video games in the classroom stems from the tremendous amount of profit their product already brings in. In an attempt to solve this issue, Shute, Ventura, Bauer, and Zapata-Rivera (2009) present a two-stage approach to address the problem:

> (1) analyze existing games to determine the kinds of activities that support learning, and then (2) use the knowledge to inform the development of design principles and practices for creating new games for 21st century skills. These new games would be as fully engaging as their predeces-sors, but would additionally be founded on research from cognitive science, educational measurement, and artificial intelligence. (p. 317)

One of the greatest obstacles that still remain is the mismatch between the skills and knowledge acquired through participation in digital games and the skills recognized within the school's curriculum. Teachers surveyed in TEEM's *Report on the Educational Use of Games* were noted as believing that, while they believed in the skill sets developed through game playing, there was simply not enough time in the day to teach them as they did not fall in line with curriculum and would therefore be ignored (McFarlane, Sparrowhawk, & Heald, 2002). If teachers truly feel this way then they should begin to push for a change in curriculum. If students are more engaged and motivated in the presence of digital games as educational tools, then teachers must not stand by idly as they are missing opportunities to prepare their students for what the future holds. If time really is of the essence, teachers would better suite their students if they find ways to equip them with the necessary 21st century skills outside of the classroom. For instance,

assigning projects for homework that have the students play these types of games either at home or the library where this type of technology is accessible to everyone.

In spite of the disputes between how video games can be used in the classroom and how useful of a tool they can be, insufficient research has been done on the connection between gaming and academic performance. With the research available, it is clear to see that video games do indeed facilitate learning, however, the extent to which is difficult to say at this point. When analyzing arguments on whether or not digital games can be integrated into the classroom, it is clear to see that educators should no longer ask if these types of games can be utilized, but how they can be used. As national standards become increasingly demanding and the skills in which we require to function in the 21st century change, digital games can prove to be a tremendous tool for both teachers and students. As it was previously mentioned, the Horizon Report stresses the notion that in only the matter of a few years, more and more games will be incorporated into schools. However, because the idea is relatively new and scarcely researched many educators are timid to utilize these games as educational tools. Educators must begin seek education for the potential use of video games in the classroom so to not get caught behind the times as technology only advances day in and day out and the potential value of educational opportunities found in video games become virtually limitless.

Method

Context

Research for this study took place in multiple locations in the Town of Riften (pseudonym), a suburb of Rochester, NY which is located in Monroe County. All participants including the students and faculty given the questionnaire, as well as the Davidson (a pseudonym) family that participated in the gameplay portion of the study, live in Riften and

attend Riften Central Schools. The Davidson family consists of a mother, father, and two children – one male and one female. The town of Riften is a heavily populated suburb of Rochester that is continuing to develop and grow. The suburbs of Hilton, Gates, and Spencerport surround the town of Riften, while the north eastern section of Riften borders Charlotte as well as the city of Rochester. The town has a population of approximately 14,500 people in 2010 with a median age of 43.7 years old. The population is made up of low to middle class income families, with the median household income at $48,124. The percentage of individuals, aged 25 years and over, who hold a high school degree (or higher) is 85.6%. A variety of races make up Riften: White alone - 12,369 (85.2%), Hispanic - 781 (5.4%), Black alone - 736 (5.1%), Asian alone - 343 (2.4%), Two or more races - 232 (1.6%), American Indian alone - 30 (0.2%), Other race alone - 26 (0.2%), Native Hawaiian and Other Pacific Islander alone - 2 (0.01%) (City Data, 2010).

Locally, there is a library which offers internet services, activities for children, and reading workshops, where storytellers read books to children. About a mile away from the school is the YMCA, which offers afterschool programs, childcare, intramural activities, and different sports camps for youth. Within 2-3 miles from the school you will find a number of different grocery stores, with numerous locations within the district. From Walgreens and Rite Aid to Aldis, Tops, and Wegmans, these stores provide a variety of foods and a great selection of ethnic fruits and vegetables to include all cultures.

The specific section of Riften that was observed and analyzed was that within a two-mile radius of Jefferson Elementary School (pseudonym); a building located in the heart of Riften consisting of grades from three to five. As of 2010, Jefferson has an enrolment of approximately 350 students with 21 students in self-contained classrooms. The racial makeup of the students is

72% white, 14% Black or African American, 11% Hispanic or Latino, and 3% Asian. Jefferson

also has students with limited English proficiency of which make up 5% of the student body.

16% of students are eligible for reduced-price lunch and 26% of students qualify for free lunch

(City Data, 2010).

Participants

The teachers that were included in the study include two third-grade and three fifth-grade

teachers, as well as two special education teachers in an 8-1-1 classroom. Both third-grade

teachers have been teaching within the school for five years, while the fifth-grade teachers have

been in the school for at least five years, with additional years within the district at other

locations prior to their stay at Jefferson. The 2012-2013 school year marks the second year at

this particular school for both special educators, though they have also taught in a variety of

districts throughout their professional career as well. The teachers chosen for this study are

Caucasian, middle-class residents of Riften, and all but one are female. Each teacher has

graduated with a Bachelors degree in Education as well as certification in special education.

Additionally, two of the fifth grade teachers hold a Masters degree in Educational

Administration.

Data for the study was comprised from two different sets of students. The first, a

classroom of 23 fifth-graders at Jefferson ranging in ages from 10 to 11 years old, were given

questionnaires regarding their habits and opinions of video games both in and out of school. The

makeup of the classroom is one of the more diverse classrooms in the school. Out of the 23

students, 17 are white (8 boys, 9 girls), 4 are African American (2 boys, 2 girls), and 2 are

Hispanic (2 girls). Academically, the majority of the class is not reading at grade-level as

observed on their most recent Fountas & Pannell assessment scores. Typically, student scores show that while they are able to read at high accuracy, a lack in comprehension makes up for the low scores. Five of the students receive pull-out services for ELA and are gone two to three times a week for approximately one hour. Students in this class are, for the most part, very outgoing and up-to-date with today's fads, technologies, as well as pop-culture icons.

The second group includes the two children of the Davidson family, Quinn and Emily (all pseudonyms). They are biological siblings and range in age from 11 to 15. The Davidson family is a white, middle-class family located in Riften. Quinn and Emily are residents of Riften but attend separate schools within the district. Both participated in the actual observation/study using the video game *Scribblenauts* Unlimited.

Quinn is a 5th grader from Whales Elementary (pseudonym), is an outgoing and athletic boy who enjoys spending time outside and is active in many different sports such as basketball, football, and baseball; he also enjoys spending time playing video games with his friends and father in his free time. Quinn attends general education classes and is currently reading independently at level W. He does not receive any push-in or pull-out services, and has a positive attitude towards reading and writing.

Emily, a sophomore at Olympus High School (pseudonym), is an extremely social and outgoing individual who spends her time participating in cheerleading, theater clubs, dance, and karate. Academically, according to her mother, Emily is determined to do her best but her writing, word identification, and comprehension is greatly affected by executive functioning disorder (Other Health Impairment – OHI) and attention deficit disorder and is categorized with executive functioning disorder as well as ADD. The mother reported that while Ericka is able to

read on an eighth grade reading level, she struggles and enjoys reading independently on a fifth

to six grade level. Ericka enjoys spending time reading books that relate to her personally,

particularly series about middle school life and other topics and adolescent may encounter

growing up. This is also her favorite area of writing. When asked to write a creative piece,

Ericka excels when writing about imaginary topics or events that occur in day-to-day life.

Researcher Stance

Presently, I am a graduate student at St. John Fisher College pursuing a Masters degree in

Literacy Education, birth – grade 6. I have a Bachelors degree in Childhood Education, in

addition to certification in Special Education. Throughout this study, I will act as an active

participant observer. In conducting myself in this role, I will be able to dynamically place

myself into the study, allowing myself to teach while at the same time observing the results from

the study (Mills, 2011). One of the major implications that surround the integration of video

games into the classroom is that teachers may or may not have enough information on, or

experience with, the game being used. It will be my task to first discover all of the possibilities

the game has to offer for the purpose of expanding the participant's knowledge of the game and

potentially altering the study to accommodate for the individual's levels.

Method

To acquire both qualitative and quantitative data for the study, I used three different

groups of participants. Teachers at Jefferson were given a questionnaire (Appendix A) which

will be used to examine professional opinions on video games in education. Teacher

questionnaires first offered a brief description and summary of a popular game that many believe

can be integrated into the curriculum in a number of ways. *Civilization V* is a turn-by-turn based

game in which the player controls an infamous leader and their "civilization" from the beginning of time to the present and eventually future. In the questionnaire, I gave brief detail as to what the user will encounter. In that, they will have to make decisions for their society regarding diplomacy, religion, technology, sciences, etc. The game is won when a civilization surpasses other societies in terms of the games score of one's diplomacy, scientific, domination, or cultural influence. Teachers were asked to read the description given and then answer a series of five questions on a 1-5 rating scale from *strongly disagree* to *strongly agree*. Afterwards, teachers were asked both the current state of video game integration in their classroom as well as their professional opinion on whether or not video game integration would prove beneficial to their students.

Students in a 5th grade classroom at Jefferson were given a separate questionnaire (Appendix B) which will be used to examine their video gaming habits, preferences, and thoughts on using video games as an educational tool. Students were given their questionnaire in the middle of the day, after lunch. Students were not told much about the survey other than that it was going to be used by myself for a project I was conducting.

The last group, the children of the Davidson family, participated in actual gameplay sessions of the study. These sessions took place on three separate occasions and were each approximately 25-30 minutes in length. Prior to the first session and following the last session, both participants were given an assessment (Appendix D) which was used to examine the growth they experienced while playing *Scribblenauts Unlimited*. This game is in its most basic sense is a fun, interactive, and engaging video game that promotes academic (grammar), creative, and social skills. Throughout the game, users are asked to complete numerous objects to help the citizens of the fictional city. In order to accomplish the tasks, the player uses a magical notebook

which is used to type in any word, with the exception of profanity and copyright materials, to make them appear on screen to be used in their quest to help the people in need. The game's central focus is on the use of nouns to make items appear and adjectives to alter the item. While the game offers and open world in which the user is able to pick and choose where they would like to go and what they items they want to spawn, the first session's objectives were guided by the researcher. Throughout the following sessions participants were given free range to go where they please and use whichever items they felt would be best in order to complete objectives. For the purposes of the how this game can be used to foster spelling skills, participants were, from time to time, asked to use spawn items from their list.

Each session occurred on a one-on-one basis in the family's living room as the researcher took intensive observational notes and guided the individuals through the gameplay as needed. The environment was relaxed to encourage and open discussion between the participants and researcher. In order to utilize the study to its maximum potential, both individuals were first given a walkthrough of what the game was about and what kinds of objectives they would encounter. As the researcher, once I felt the participant was ready to continue on their own, they were allowed to progress past through the tutorial portion of the game.

As the participants became engaged, I observed their interactions with the game. This included attitudes throughout each session as well as their engagement, motivation, and communication/responsiveness with the researcher. Observations of on-task behavior were an essential part of this study. These types of behaviors include the player's ability to remain goal oriented throughout the duration of gameplay. In other words, behaviors that would not be considered on-task would be observations of how often they would stray away from the main objective of the game. The player's motivation was also observed. For the purposes of this

study, the motivational factors occur when the participant showed interest and excitement for the game. Motivation also occurred when the individuals used the engaging features of the game to progress. These factors include using achievements to unlock new characters, outfits, and levels. Communication was another key component of the study. This will be based on questions, comments, or concerns that the participant raises about his or her gameplay and whether or not they respond to any hints or suggestions given to them by the researcher.

Quality and Credibility of Research

To assure action research studies remain creditable and accurate, it is essential that each study evaluates its techniques. In order to do so, Mills (2011) has drawn on the work of Guba (1981), identifying credibility, transferability, dependability and confirmability as essential components of a qualitative research study's trustworthiness. With this knowledge in mind, the four aforementioned components have all been thoroughly examined and put into place within the current research to ensure its trustworthiness.

Credibility is defined by Mills (2011) as a "researcher's ability to take into account the complexities that present themselves in a study and to deal with patterns that are not easily explained" (p. 104). Taking this into account, I practiced triangulation to ensure the results from the study are credible, reliable, and unbiased. Triangulation occurs when the researcher uses a variation of sources and methods in order to collect and validate the data. Throughout this study, I was able to triangulate the data through the combination of inquiries and examinations. I investigated data on the perceptions of students and teachers regarding the integration of video games in education then pair that data with the results of the pre and post assessments of three

individuals actively participating in video game play. I was then able to cross examine both sets of data which will led me to an accurate and reliable set of data.

Alongside credibility, transferability is another essential component of my research that will be assured. Transferability within a study refers to the ability of the resulting data to be applied to other contexts or settings. According to Mills (2011), it is the responsibility of other researchers to then utilize the results and decide the how applicable it is within other contexts. I ensured transferability in my study by taking extensive, methodical notes during my observations. Accurately describing the setting and context of which the study took place will allow the data I collected to be generalized in a way that allow the results to be used in other settings.

In order for research results to be deemed usable in other contexts, the results of my study must be dependable. Mills (2011) claims that dependability comes from the consistency in data collection. Triangulation was again essential in assuring that my research is dependable. By using questionnaires, observations, as well as pre and post assessments, I was capable of verifying my data's dependability.

Confirmability is the last of the essential components of credible and valuable research. According to Mills (2011), confirmability is the "neutrality or objectivity of the data that has been collected" (p. 105). In order to make certain my research included this, I took extensive field notes to track a number of different factors and events. For instance, I consistently checked and re-checked my notes not only during each observation, but in between each session to check for possible discrepancies between the individuals. These observations allowed me, if any inconsistencies were found, to make sure each participant is following directions. Taking

detailed notes also allowed me to keep record of any negative matters that occurred in the study

and any other instances that may have caused alterations in the data (environment, mood, time of

day, etc.). As the sole researcher in this study, I also took into account my own biases. Though I

have always been a fan of video games, I had to make certain that my approach in this study was

a researcher, not a gamer. Once all of the data is collected and analyzed, including potential bias

in my study will only increase the confirmability of the research.

Informed Consent and Protecting the Right of the Participants

Prior to undergoing my research, parental permission was required from all students that

were participating in the study. I sent home a letter with each student asking their parents to sign

for permission to use their child's data in the study. Once I received the letter, I needed to

receive informed assent from each student. With regards to the 5th graders and their response to

the questionnaires, as well as the two individuals participating in video game playing, I explained

to them as a whole what it was I was asking them to do and that any information they included

on the paper would be used in my research. I assured both parents and students that their names

would not be recorded or used in any way. In the case of the two participants that will be

observed in video game play, I assured to both them and their parents that a pseudonym would

be used to maintain privacy. Questionnaires completed by teachers were finalized once I

explained to them what the data was going to be used for and that only the grades they teach (not

names) would be used. They then signed the consent form.

Data Collection

For the purposes of triangulation, three forms of data were collected. One piece of data

collection that was used is student and teacher questionnaires. Students were given a

questionnaire (Appendix B), which asks a variety of questions regarding their interactions with video games both in school and out of school. The questionnaire tracked age, gender, how frequently individuals play video games and the duration of each video gaming session, as well as their opinions on whether or not video games could be used as an educational tool in the classroom. Teacher questionnaires (Appendix A) were given after they were asked to read a brief description of *Civilization V*, a popular video game that many believe can be educational, and then asked to rate on a scale of 1-5 the potential use of that game for throughout different subjects. The questions were as followed: This game could be used as a tool in the classroom to 1. Facilitate student learning, 2. Encourage ELA skills, 3. Motivate/engage students, 4. Help teach certain fundamentals in Social Studies, 5. Integrate into the classroom. Last, teachers were asked about the current state of video game education in their classroom and their opinion of whether or not they believe video games could play an integral part in their day-to-day teachings. The last two sources of data will be collected from the Davidson children as they participate in video game play sessions at their home.

The second source of data collection comes from observational field notes that were made throughout each of the three sessions in which two students participated in playing the videogame *Scribblenauts Unlimited*. Specifically, as each participant engaged in the activity, the researcher looked for on task behavior, engagement, communication, and ability to use the game to explore and create. A rubric was created for the researcher to use throughout each observation (Appendix E).

The last piece of data is the collection of student work gathered from the study which came directly from the pre and post assessments. The assessment was given prior to the first and following the final session. The assessments asked the student multiple-choice questions on the

use of nouns and adjectives, asks participants to spell twenty words of which will be used

heavily throughout gameplay, followed by a writing sample in which the student must add nouns

and adjectives to a vague story in order to make the story more appealing and detailed.

Following the conclusion of the post assessment, the student's scores were analyzed and

compared to the scores of their initial assessment. This was done in order to record any growth

in the participant's ability to identify nouns and adjectives, spell a certain set of words, and

accurately add nouns and adjectives into a piece of writing for the purpose of making the story

more detailed and meaningful.

Data Analysis

In order to collect the appropriate information necessary to complete this study, a number

of sources were used to collect the data. These sources include questionnaires, field notes, and a

pre and post assessment. Once the data was collected, I began to analyze the information and

look for connections across each of the sources. The first analysis was completed using the

quantitative data; the questionnaires that were given to the teachers and students of Riften

Elementary. The student and teacher questionnaires, however, were kept separate. The data

from the student questionnaires were organized into tables and displayed according to gender.

Teacher data was gathered using the Likert Scale and then organized into a table. The scores

were given as percentages in order to show how many teachers disagreed, remained neutral, or

agreed. A pre-assessment was given to the two individuals that were participating in the actual

gameplay portion of the study. Then, later, they were given a post assessment. Observational

field notes were taken throughout the course of three video gaming sessions with the two

individuals and were recorded in a note book. Once all of the data was collected, it was

organized and read through. The second time I read through the data, I began to look for pieces

of the data that would help to either prove or disprove my research question; each piece of

information was given a code. As I continued to read over, analyze, and code the data, I began

to compare the codes from one source of data to another in order to find similarities and

differences. These codes were then compared to leading research and theoretical frameworks.

Findings and Discussion

Over the past three decades, technological advancements have made a significant impact

on society. One way in which technology has affected individuals is the ease of which younger

generations of students have access to digital devices (i.e. cell-phones, computers, portable

gaming devices, etc.). As the rate of which advancements within our society increase year by

year, many researchers and educators have pondered the idea as to what roles can these new,

accessible devices be used in the classroom as a learning tool? One progressive idea is the

thought of how can video games, which are widely used as sources of entertainment for millions

of individuals, be utilized as a teaching tool. The goal of this study is to find out not just the

perceptions students and teachers have in regards to video game integration, but if, in fact, video

game playing can actually enhance a student's literacy skills. This section encompasses student

responses to questions based on their video game habits and perception of video games as a

learning tool as well as teacher responses in regards to their thoughts of including the game

Civilization V into their classroom. Furthermore, two students were used to participate in a

hands-on activity that was used to determine whether or not their experiences playing the game

enabled them to achieve higher literacy scores. The findings suggest that while student and

teacher perceptions for video game integration, for the most part, are positive and that an

individual's literacy skills may indeed strengthen through video game play, there are still a

number of factors that contribute to whether or not full video game integration into the classroom would prove beneficial to both teachers and students.

After examining the collected across multiple sources, three themes emerged from the study. The first theme exposed the optimistic perception both teachers and students have in the integration of video games into the classroom. The second theme shows that there are motivational factors that determine success. The last theme uncovers gender differences that may create a learning curve that will affect success.

Student and Teachers Are Optimistic About Video Game Integration

One of the controversial components of video game integration that many advocates face is in regards to the perceptions students and teachers carry regarding the potential use of video games in the classroom. In order to address this concern, students and teachers were given questionnaires which asked their opinion/thoughts about the use of video games as an educational tool within the school. The table below shows student data collected from a classroom of 16 fifth-graders regarding their video game habits and thoughts about using video games in education. The scores are shown as a whole class then broken up by gender.

Table 1

Student Responses to Questionnaire: Game Habits and Perceptions (Averages)

	Class (16)	Male (8)	Female (8)
Days you play video games per week (0-7)	4.7	5.4	4
Hours you play video games per day (0-24)	1.9	2.8	1.1
How much do you feel games influence you (Scale 1-5)	2.6	3.3	1.9
Do the video games played in school help you learn? (Scale 1-5)	3.3	3.8	2.9
How likely are you to skip the parts in a video game that have you read? (Scale 1-4)	2.3	2.1	2.5
Top Three Games	1. Minecraft 2. Call of Duty 3. Subway Surfer	1. Minecraft 2. Call of Duty 3. Spider-Man	1. Minecraft 2. Subway Surfer 3. Call of Duty

Table 1 displays the averages for the student responses given regarding the questions that were given in order to gather pertinent information for the research topic. According to the data, it is evident that there is a significant gap between males and females in terms of their video game habits and perceptions of video games as an educational tool. Males, on average, participate in video game play nearly a day and a half more than females in this particular classroom. Furthermore, males also spend more time per day playing video games, nearly two hours more per day. Observational data will later be discussed which suggests that boys may be more familiar with video games. The statistical fact that boys spend more time per day/week

playing video games than girls may contribute to the reasons in which boys are better prepared

for a video game experience. While at first glance, it appears that the data collected confirms

many preconceived notions about males and video games, much can be said about the potential

motivational factors that video games can provide to students just by looking at the data.

  Data from this study shows that males are, on average, more influenced by games than

girls. For the purposes of this study, the level of influence video games has on a student does not

refer to the idea that a child who plays violent video games will indeed become violent

themselves, rather the ability of video games to have a positive and engaging impact on the

player/learner. The degree to which boys are influenced by video games may partly be due to a

number of circumstances. First, as previously mentioned, boys spend a greater amount of time,

on average, than girls participating in video games. Thus, when a person spends a greater

amount of time participating in an activity, they are more likely affected by said activity. The

influence of video games is powerful; they are capable of transcending the actual video game

playing experience itself. For instance, boys, who engage in video games, are more likely to

read computer game magazines (McFarlane, Sparrowhawk, and Heald, 2001). As compared to

individuals that read books based on popular movies or TV shows, gamers often read gaming

magazines to acquire information on up-and-coming games, hints, tips, as well as a way to

inform future purchases of a game.

  While boys may put extra outside effort to read information on a game, what is

interesting, however, is the one area from the collected data that girls surpassed the boys:

Likelihood of skipping over dialogue in the game. Whereas boys may skip ahead to get to the

action, females, according to this study, are more inclined to read the directions and dialogue

throughout the game. These findings correlate directly to the data that discovered that, on

average, boys are more experienced video game players than girls. In situations such as skipping direction and dialogue, the boy may have a higher sense of confidence in his ability to "wing it". This exact scenario played out in the video game sessions with two individuals which will be discussed later in this section.

When asked whether or not they believe the video games they play in school help you learn, males reported greater scores than females, by nearly one full point. What is interesting about this set of data is that for the most part, students in this class are only allowed to play the same game on a regular basis: *Reflex Math*. What this data could mean then is that, overall, males have a more optimistic perspective of video games. The data in this study has already shown that males not only play video games more frequently than girls but also feel more influenced by the games. These positive feelings could show, to some extent, why boys are more likely to feel as though they are getting something out of the game (learning). On the other hand, girls who don't have the same relationship and hold the same values with video games are less likely to feel as though the games are doing anything for them.

It is important for researchers and educators to understand that the to understand that the "stereotypical picture of the lone boy playing aggressive computer games alone in his room is not fully representative of young people's use of computer games" (McFarlane, Sparrowhawk, and Heald, 2001). The data collected in this research study directly correlates to this idea. According to the data collected from the questionnaires, girls participate in the same "boy games" as their male peers. It is however, important to understand that there is still a large disparity amongst boys and girls on the frequency and duration of which individuals play video games. Gros (2007) claims that this large discrepancy is important because video games are often viewed as a precursor to computer literacy; children often start using the computer not to

browse the internet or conduct research, but to play games or find other sources of entertainment. It is because of this that the gender imbalances of computer game playing have been a recent discussion amongst researchers and video game developers to create "girl games" with non-violent themes.

In order to not only acquire data on student attitudes of video game integration, six teachers were given a separate questionnaire which asked them their thoughts and opinion of integrating a specific game into their curriculum. For the purposes of this study, teachers were given a description of the game *Civilization V* then asked to give their opinion on the potential of the game to be utilized as an educational tool in the classroom. The table below shows the results from the teacher questionnaires. Each question was based on a scale from 1-5; 1 being strongly disagree, 5 for strongly agree, and 3 for neutral. Each question was preceded by the following statement – This game could be used as a tool in the classroom to:

Table 2
Teacher Responses to Ability of the Video Game to Facilitate Learning

Question: This game can be used to:	Teachers Response (Percentage)				
	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Facilitate learning	0%	0%	17%	67%	17%

Based on the table above, it can be seen that the majority of teachers selected believe that the video game *Civilization V* could be used as a way to facilitate learning. While none of the teachers disagreed with this idea, 17% of the teacher remained neutral. This may be in part to their unfamiliarity with video games; not knowing the potential. Furthermore, 67% were in agreement while 17% strongly agreed that video games could facilitate student learning. These

teachers wrote answers such as "they're engaging" and "students are used to this type of learning

due to the amount of technology they have in their homes" (Questionnaire, 2013).   The teachers

that agreed with this statement were more familiar with educational video games; they were

aware of what video games have to offer.

In response to this question, one educator claimed that learning would "depend on

student interest in the game" (Questionnaires, June, 2013). What the teacher is saying is that,

just like any learning tool, if a student is not interested in the topic, they are less likely to grasp

the concept; thus, learning declines. This concept could potentially be difficult for researchers,

educators, and game developers to grasp. While it has been observed previously that girls in the

fifth grade were playing the same games as the boys, it must be understood that this could

partially be in part to the universal popularity of the game; the game, in essence has transcended

gender boundaries. A game like Call of Duty, however, will never be considered as a part of

education curriculum. What this teacher is hinting towards, while it wasn't directly stated, could

possibly be the understanding that to use a video game in the classroom as an effective teaching

tool, it would have to pique the interest of not just a few individuals but all of the individuals in

the classroom.

Table 3 below shows the rankings of the teachers when asked whether or not the video

game *Civilization V* could be used as a way to encourage ELA skills.

Table 3
Teacher Responses to Ability of the Video Game to Encourage ELA Skills

Question:	Teachers Response (Percentage)				
This game can be used to:	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Encourage ELA skills	0%	0%	17%	50%	33%

In the above table it is evident that these teachers believe that participating in video games would encourage students to hone their literacy skills; none of the participants disagreed and only 17% claimed to be neutral. While the 50% of teachers agreed to the statement, they may believe, as one teacher in particular stated, that a video game "*must* contain a form of reading/comprehension" in order for it to be an effective learning tool. These teachers were missing out on what Steinkuehler (2007) referred to as "constellation literacy practices" (p. 301). These refer to the magazines, FAQ's, and game guides that a student may read as they become immersed in the video game. Believing reading and comprehension must be built into the game is likely a common assumption for those looking to integrate video games into schools. What is interesting is how this thought is the type that prevents video games from being included in the curriculum; video games offer a wide variety of educational opportunities despite whether or not there is actual text in the game the forces the student to read. In a study conducted on the influence of video games has on student writing, Harushimana (2008) claims that "teacher education programs need to prepare future teachers of Nintendo and Post Nintendo generation learner to adequately address pedagogical situations that involve digital intelligence" (p.2). If educators are worried that a game may lack insufficient reading and comprehension components, teachers must learn to look for the endless supply of teachable "treasures" hidden within video games. Out of the group of teachers questioned, 33% of them strongly believed that playing the video game would encourage ELA skills to grow. One of these individuals claimed that "students love interactive real-life simulations. I feel this would be engaging and motivating" (Questionnaires, June, 2013). The teachers that strongly agreed may have known that in order to play *Civilization* V, which is, in fact, a type of simulation game, the student would be required to

read directions in order to make informed decisions. Because this teacher believes that

simulations are engaging, the student would be less likely to skip the reading sections of the

game.

Table 4 shows the rankings teachers gave when asked if the video game *Civilization V*

could be used to motivate and engage the students in their classroom.

Table 4
Teacher Responses to Ability of the Video Game to Motivate/Engage Students

Question: This game can be used to:	Teachers Response (Percentage)				
	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Motivate/Engage Students	0%	0%	0%	33%	67%

It can be said that creating a motivating and engaging environment within the classroom

is one of the most quintessential building block to foster learning. It is with this reason that

many advocates of gaming integration believe video games could prove to be a valuable tool

within the classroom. While it must be noted that just because video games can be engaging and

motivating, does not mean every game would be a successful teaching tool. What is interesting

however, when analyzing the collection of data provided by the teachers, is that this question

received the highest scores with 33% agreeing and 67% strongly agreeing. The high results as

shown by the table could be due in part by the understanding that video games are extremely

popular in today's culture and anything, for the most part, that is popular can be used to

motivate. Many of the teachers had a lot to say about the motivational opportunities in video

games. One teacher in particular claims that "if (video games) promote engagement and student

learning it can be another tool used for student success" (Questionnaires, June, 2013). This

shows that the teacher is aware that student learning and engagement/motivation go hand-in-

hand. Another teacher, who felt the same way claims that they "like the idea of highly motivating students through gaming". This teacher believes that gaming can be utilized on a much broader scale; video games can motivate students throughout the day, not just when they need to learn. This feeling is likely because students are comfortable with and confident in their use of new age electronics and video games, much like the teacher earlier who claimed that students would be more engaged because they are used to the style in which learning is promoted through video games.

Below, table 5 shows the scores teachers gave when asked how strongly they felt *Civilization V* could be used to teach students some basic understandings in social studies.

Table 5
Teacher Responses to Ability of the Video Game to Teach Social Studies

Question:	Teachers Response (Percentage)				
This game can be used to:	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Teach Social Studies	0%	0%	17%	67%	17%

According to the data table above, 67% of teachers agreed that *Civilization V* would be capable of teaching students Social Studies and 17 % strongly agreed; 17% of the teachers also remained neutral on the statement. There were, however, no teachers who disagreed or strongly disagreed. When teachers were asked to offer their opinion on whether or not video games could be used to promote learning on more concrete topic such as social studies, the written responses/comments were non-existent. The lack of responses could be due in part by a number of different factors. Many teachers referenced video games were best used as tools for math, because that is the only area in which they have been trained to facilitate video game learning.

For instance, one teacher claimed to "only use video games as an incentive or recess activity.

Games such as those found on coolmath4kids.com or *Reflex Math*" (Questionnaires, June, 2013).

An additional possibility could be due to the teacher's unfamiliarity with the game content.

While someone familiar with *Civilization V* may be able to site a number of different ways the

game could be used to teach certain parts of social studies, teachers may not always have that

same knowledge. McFarlane, Sparrowhawk, and Heald (2001) state that in order to successfully

utilize video games in the classroom teachers must "recognize and map the relationship between

activities in the games and the associated learning before they can embed the use of the game

within the wider learning context" (p.16). In order to use a game such as this to teach across

content areas, there must be a great deal of preparation made by the teacher. Often, they may

feel as if there is simply not enough time in the day.

The final set of data acquired from the teacher questionnaire, as represented by Table 6,

shows each teachers thought on how well video games could be integrated into the classroom.

Table 6
Teacher Responses to Ability of the Video Game to be Integrated into the Classroom

Question: This game can be used to:	Teachers Response (Percentage)				
	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Integrate into classroom	17%	0%	17%	50%	17%

According to the data provided by Table 6, it is clear there are diversified feelings of

whether or not video games could, or should, be integrated and to what end. 17 % of the teachers

strongly disagreed with the idea of integrating video games into the classroom, while 17%

remained neutral. Of the teachers questioned, 50% were in agreement and 17% strongly agreed.

An interesting concept appears here when connecting this data to the data analyzed in Table 5.

While it appeared that, for the most part, that teachers believed video games could teach Social

Studies skills, when they were asked if video games could be integrated into their classroom, the

scores dropped. Some of the fluctuation in data could partially be due to the hypothetical

situation that teachers were answering in. In other words, when teachers thought about whether

or not the game could be used to teach Social Studies, they may be have reacted positively.

However, when asked to consider their own classroom it forced them to consider their class,

schedule, teaching style, and habits which could have caused them to think slightly less of the

idea of video game integration.

What is most interesting from this set of data is the correlation between the answers given

by Teacher 3 and Teacher 4.   Both are teachers in the same 12:1:1special education classroom

but have dramatically different views on video games place in a classroom. On one hand

Teacher 3, who agreed with the statement, felt that video games could offer support to the

students as "an additional center activity, especially for students what struggle with reading and

math- for learners that are more concrete" (Questionnaires, June, 2013). The teacher believes in

the video game's ability to provide the student with good drill-and-practice scenarios that will

help them grasp fundamental concepts in reading and writing; this is a quintessential component

of video games that can make them successful in the classroom. As Dickey (2005) claimed

earlier, video games provide clear and distinct goals, provide immediate feedback, and offer little

to no consequences for failing and retrying an objective until it is completed. Teacher 4,

however, had completely opposing views on this topic, stating simply, "I would not use video

games in the classroom." When cross-analyzing this teachers data from Table 5 to Table 6, it

can be seen that their score dropped from a 3 to a 1. The variation could possibly be explained

by the teacher's teaching style or beliefs but could also show that there might be a lack of knowledge on video games. The individual may not know enough about the potential of video games or how to harness that potential to help her students. Disconnect between the two teachers may stem simply from opposing viewpoints of video games or a knowledge of how video games could be utilized. Regardless the reason, the ones that will could potentially suffer from this disconnect are the students. If a co-teaching classroom is going to go forward with an activity, both teachers need to be on board and willing to give 100%. If two teachers in the same class have such drastically opposing views on something it may, in the end, negatively affect their teaching styles. Students may become aware of this and the engaging/motivational factors that video games provide may get lost. In order for video games to work in a classroom such as this, both teachers need to be on the same page: educated, motivated, and confident.

There is still a tremendous amount of debate surrounding the use of video games in the classroom and even if video games were to one day be fully sponsored and universally used in every classroom, one obstacle still remains – are students equipped with the proper skills necessary to take part in video game learning and are there . In order collect data necessary to answer the question of whether or not video games can increase a student's literacy skills, two students were observed for the duration of three sessions playing the video game *Scribblenauts Unlimited.* In order to calculate student growth, both students were give a pre and post-assessment. The results of these assessments can be seen in the following tables (7-8).

Below, Table 7 shows the results from Emily's Pre Assessment and the Post Assessment given one week later.

Table 7
Emily's Scores for Pre Assessment and Post Assessment

	Nouns – Adjectives	Spelling	Writing

Pre-Assessment (7/1/2013)	2/5 – 3/5	12/20	3/5
Post-Assessment (7/8/2013)	3/5 – 3/5	14/20	2/5

The results as shown by Table 7 indicate a steady growth in many of the areas Emily was tested in. Specifically, she increased the number of nouns she was able to recognize by one. Emily's improved use of nouns is best seen in the question that asked her to select the common noun from the sentence *Mandy is going to name her new puppy Toby*. During the pre-assessment, Emily answered "Mandy" but during the post-assessment she correctly identified "puppy" as the common noun. This can be attributed to the design of the video game *Scribblenauts'* which focused on user imagination to spawn a person, place, or thing. Furthermore, the game forces the user to decipher between common nouns and pronouns as the rules do not allow for trademarked items. Emily showed no improvement in her use of adjectives which may be attributed to the difficulty she had in utilizing the "add adjective" feature within the game. Had she been more comfortable with the feature, she may have practiced with adjectives more, thus, increasing her skill when identifying and using adjectives. Emily also increased the number of words she correctly spelled by two. In Emily's case, both words *fire-hose* and *invisible* were incorrectly spelled during the pre-assessment but correctly spelled in the post-assessment. This progression can be attributed to the persistent use of the specific spelling words throughout each gameplay session. While she did show signs of improvement in these areas, there was a noticeable decline in her writing score. Using the *6+1 Writing Traits Rubric*, her ability to rewrite a boring, incomplete story using nouns and adjectives was scored. During the pre-assessment, it can be seen that Emily put much more

thought and description into her writing with better transitional phrases. During the post-assessment however, her writing seems rushed and bland. There are a number of reasons this could have happened. First, given the time of year, summer vacation, and the fact that the post-assessment was the last thing keeping her tied to the study, she may have rushed through just to complete it and be done. Emily, however, was also quite sick throughout the week, suffering from anxiety attacks and getting very little sleep. While she appeared to be healthy alert on the last day of testing, there is no doubt this could have played a significant role in effort she exerted.

Below, Table 7 shows the results from Quinn's Pre Assessment and the Post Assessment given one week later.

Table 8
Quinn's Scores for Pre Assessment and Post Assessment

	Nouns – Adjectives	Spelling	Writing
Pre-Assessment (7/1/2013)	2/5 – 3/5	17/20	3/5
Post-Assessment (7/8/2013)	4/5 – 4/5	19/20	4/5

According to Table 8, Quinn showed signs of growth in almost all areas he was tested in. To begin, he was able to increase his ability to identify nouns, specifically, common nouns. One example of this occurring was Quinn's response when asked to identify the common noun in the sentence *David wants to travel many countries when he grows up*. His initial answer in the pre-assessment was "David", however during the post-assessment he was able to correctly identify "countries" as the common noun, knowing that David is a pronoun. Again, this progression can be directly attributed to the game's design, which focuses the player to use common nouns, not the names of a person, organization, building, etc. Quinn also showed progress in his ability to

identify adjectives. During the pre-assessment, when asked to pick the adjective from the sentence: *The chubby baby clapped his hand excitedly* Quinn claimed that "excitedly" was the adjective. During the post-assessment, however, he correctly identified "chubby" as the adjective. Quinn's growth here was due to his ability to utilize the in-game "add adjective" feature. He became fascinated with the ability to apply an adjective to anything in the game and make it fast, gigantic, red, invisible, etc. Quinn's ability to use this function in the game can be cross-analyzed with Emily's lack of growth in adjective use, as she, unlike Quinn struggled with the "add adjective" feature. Quinn also showed growth in his ability to spell a set of words. The words "guitar" and "chocolate" were incorrectly spelled during the pre-assessment but spelled correctly during the post-assessment. Again, this can be attributed to the instructor's guidelines that they were to use their spelling words throughout the game to help them achieve objectives. Quinn's writing, to some degree, showed significant improvement. While there are still many areas in which Quinn needs additional help, the assessment was judging his ability to add nouns and adjectives to a boring/incomplete story to make it more interesting; by those terms he was successful. While his initial piece was longer and had a better transition/flow, his writing during the post-assessment showed a significant increase in his ability to add meaningful nouns and adjectives to make the story better. It was clear the game had an effect on his writing. For instance his inclusion of a "tall guy", "gracefully swimming ducks", "hungry ducks", and "average looking house" made his post-assessment piece look like something that could have been written for the game itself.

The game certainly helped both individuals in a number of ways; most notably their use of common nouns. While both individuals knew what a noun was, prior to beginning the study neither Quinn nor Emily could describe the differences between a pronoun and common noun.

After completing the post-assessment however, I believe both students showed signs being able to decipher between the two. Spelling was another area in which *Scribblenauts* was able to help the students grow. The game's design allowed for zero consequences when spelling a word wrong. If the user incorrectly spelled a word, a list of possible answers would show up and the more the student used the word from their word bank, the more familiar they got with spelling said word. While the game itself did not directly enhance the writing style of either individual, I believe the game's ability to help the player identify interesting and useful nouns and adjectives indirectly made their writing more interesting, which, in the long run will only help the individual become a better writer. As the data from Tables 1-6 were further analyzed and investigated, two themes that emerged were that motivational factors determine success and gender differences may create a learning curve that affect success.

Motivational Factors Determine Success

When it comes to the question of whether or not video games should be integrated into the classroom, one of the most commonly debated topics is the role in which motivation can contribute to the educational value in video games. The role motivation played throughout this study was ongoing and observed in a number of ways throughout the study. However, the extent of which each participant was motivated directly correlated with their growth in the post-assessment.

While many students who engage in video game play are heavily motivated by completing obstacles and earning rewards for their success, Quinn's motivational factors were observed far before he was able to be rewarded with anything. In order to receive rewards in the game, the player has to help out the citizens in the game by spawning items. To make items appear, the player must correctly spell the word in their magic notebook. If the word is spelled

incorrectly, they are in no way penalized. Rather, they are brought to a "Did you mean…"

screen that offers a variety of words that are closely related to the way the user spelled the word.

To Quinn, despite there being no consequences to failing, he consistently got excited when the

"Did you mean…" screen did not show up, which meant he spelled the word correctly. This

occurred throughout each session as Quinn would consistently shout "YES!" or throw his hands

in the air (Field Notes, June, 2013). Emily, on the other hand, began each session with a sense of

engagement and would often claim "this is too easy" (Field Notes, June, 2013). This mindset

would last for approximately the first 15 minutes of each session. Emily would begin to get

frustrated when she could not figure out how to progress through the level which likely has more

to do with her inexperience of searching for cues in the video game to help her progress than

anything else. Had she been more familiar with the game, she may have had a better change of

knowing where to look to help her achieve her goal instead of relying on the instructor. This

routine happened time and time again when she could not figure out what the appropriate item

was that she needed to spawn or when she was prompted to use adjectives. Around the 20

minute mark, Emily would begin to show signs of boredom as she would hang her head for a

moment or begin to role backwards on the floor. Her actions most likely stem from the

frustrations she encountered of not being able to progress in the game. If she, or any other

individual for that matter, begins to get frustrated, their motivation and engagement in that

activity will ultimately suffer, as it did here.

    An additional observation that was made throughout the gameplay sessions was Emily's

loss of focus when she became frustrated at the game for not allowing her to progress. Her

attitude, in turn, caused her to take short cuts to find the easiest way through the level, ultimately

eliminating the fun out of the game and diminishing the point of learning to spell new words. In

order to demonstrate the discrepancy between Quinn and Emily's gameplay experience further, their gameplay during one particular mission was observed and recorded. The objective she faced was to provide dinner to four guests by spawning a meal for a boy, robot, vampire, and Hawaiian man. In order to feed the boy, Emily typed in pasta which was successful. For the robot guest, Emily attempted to spawn motor-oil but it did not work. Frustrated, Emily typed in "pasta" again and fed the robot pasta, which worked. From there she did not hesitate with the vampire or Hawaiian man; she fed them pasta and completed the task. In this situation, Emily was clearly too irritated to be creative and was simply doing what she could just to move on. Quinn, on the other hand, had fun with this mission. He fed the boy pizza, the robot – metal, the vampire – blood, and the Hawaiian man – chicken. Here, Quinn was much more confident and creative in his answers which could be attributed to his engagement and motivation when playing the game; he was playing to have fun. While the difference in gameplay certainly does not allow one player to come out on top of the other in terms of educational achievement, it does, in the long turn affect the individuals motivational factors that contribute to continuing the game, trying new words, which can lead to a more successful and enriching experience.

Another motivational factor that contributed to the success of the student was the in-game features that were given or awarded to the student for completing goals and the user's ability to make the most of them. For instance, the game would often reward the user with additional characters or outfits to use. The game also allowed the user to apply an adjective to the user's character. The adjective would then modify the player's characteristics. Quinn was extremely excited each time he was given a chance to try a new character or modify the appearance, making his player fly, gigantic, and fast. This gameplay feature showed his engagement was clearly in the game as he was trying to utilize all of the fun aspect the game had to offer. Emily,

on the other hand, took no part in using the rewards or in-game abilities to make the game more entertaining. This may be due to her not knowing there was a possibly to change the character traits, or, in a more likely scenario, she was not interested in the additional characteristics of the game and just want to play. After some time, I informed her that she could alter her characters appearance and attribute, to which she replied "oh, cool", yet only utilized the features one additional time throughout the three sessions. Emily's lack of interest ultimately affected her negatively as she appeared to lose focus quicker than Quinn. In doing so, she allowed the game to progress in a monotonous way. Quinn, on the other hand was consistently checking his character list and changing the things his character could do. In fact, it happened so frequently that he was prompted once or twice per session to stay on track. Although engaging and motivating factors are essential when a person learns through a video game, staying focused is also very important. In this instance, Quinn's engagement in the game went beyond what was necessary to be successful. As his excitement grew from earning rewards, he began to lose track of what was important. One motivational factor that contributes to student's positive opinions of video games in educational is that students participating in this study believe that playing video games can help them learn. The motivation data collected through the gameplay sessions as well as the questionnaires given to the fifth-graders connect on a number of different levels. Among the student data collected by the questionnaires shows that all of the students participate in a school-wide program called *Reflex Math*. This program is an educational tool on the computer aimed at strengthening the multiplication and division skills for students. It is a program they enjoy using because it allows them time away from whole-group learning to focus on their skills that are electronically rendered by the game's database. This characteristic is where the design in video games excels. Good video games create powerful emotions in the player due to the

game's dynamics which include character traits, challenges, chance for collaboration, and rewards (Squire, 2002). Both *Reflex Math* and *Scribblenauts* are capable of engaging the students because it is comprised solely of these attributes. Users are rewarded for their success and learn necessary skills while doing so.

An additional motivational factor that was observed during the gameplay sessions was one that had not been anticipated however, is a factor that could indeed play out in the classroom and contribute to the lack of success for some students. While I attempted to create a controlled environment for each session by having each participant remain alone, there was one instance where the two crossed paths. Quinn, who unknowingly entered the room to find an article of clothing, watched Emily struggle on a mission and shouted "Oh man, this is so easy! Really Emily?" Emily immediately reacted by letting out a sigh. Once Quinn was removed from the room, it was evident that Emily couldn't quite regain her focus and continued on a downward spiral until she gave up shortly thereafter. Any motivation Emily had going for her was immediately lost due to a comment made by an outsider. She may have been embarrassed, frustrated, or self-conscious about her ability to play the game at this point. The same scenario could very possibly play out in a general education classroom with a number of students with a variety of video game playing abilities. Student's may become discouraged and therefore not be able to progress through the game from embarrassment or frustration of not being the best. It will be important for the teacher using video games as educational tools to help the students understand that even though it is a video game, it is not a race or a context; although many students will undoubtedly see it that way no matter what.

Gender Differences May Create a Learning Curve That Affects Success

When both Quinn and Emily asked to participate in the study, they were extremely excited because they enjoyed the idea of spending one-on-one time with the individual conducting the research. However, when they were informed about the details of the study, specifically, the portion of the study that would have them playing a popular video game, only Quinn, the 10 year-old boy, showed any sign of excitement; either in his verbal response or body language. Emily, as observed by her reaction, couldn't have cared less however, still remained positive and enthused to continue the study. These attitudes directly correlate to the responses given by the fifth graders in Table 1. While the majority of participants carried positive and optimistic attitudes about using video games as a learning tool, the males showed a greater sense of enthusiasm.

To begin the process, before their pre and post-assessments were given, Quinn and Emily were asked a few start-up interview questions (Appendix E) to break the ice. Each student was asked about their video game playing experiences in school. Emily's response was immediate and not given much thought, "I have seen computer games, but have never played them" (Field Notes, July, 2013). This response could mean that even though video games may have been an option for Emily in school, she decided to not participate. Whether or not the video games were a part of her free time or did not fit in with her instructional plan is unknown.   Quinn's response was not only a "yes" but was able to list a few games that he himself plays in school, including: Club Penguin, Coolmath, as well as Andkon (Field Notes, July, 2013). His response, unlike Emily's shows that he is well aware of the games that are available to play in school, either recreationally or academically and also hints towards the notion that when available, Quinn will take the opportunity to play. Second, the students were asked about their opinion of whether or not schools should have video games as a part of the learning process. Emily stated that "It

could help, but it's just, I don't really care" (Field Notes, July, 2013). Again, this connects to the

findings in Table 1 which shows that females typically have a lower self-interest in video games.

Quinn's response, "Some, like Coolmath" was short, but showed his awareness that there are

games out there that can be played specifically to help out students in specific content areas

(Field Notes, July, 2013). Lastly, each student was asked why they think teachers would include

video games in their teaching. Emily claimed that "they (video games) would be used to make

you smarter; it's more interactive" (Field Notes, July, 2013). Here, Emily acknowledges why a

school might include video games in the daily schedule as they can be used as tools to help an

individual learn while maintaining interest. Quinn also believes video games could help because

they are able to guide the person to the right answer because "in the game if the player fails, the

game can help them find the right answer" (Field Notes, July, 2013). This response shows

Quinn's enhanced knowledge of video games as a teaching tool. It gives the player a chance to

practice but also guides them along the way which may give him more a better understanding as

to why he is being asked to play the game. It is clear, even based solely on the responses to the

discussion questions there is a disparity between the knowledge of information known between

the boy and girl in the study.

The discussions provided the first inclination that there would be a disparity between

what Quinn and Emily would take from this game. However, the first major contribution that

played a role in the belief that gender differences play a role in video game playing was how

quickly Quinn took off with the game. While both players were forced to play through the initial

training mode, Emily required an additional walkthrough to familiarize her with the gameplay,

whereas Quinn jumped right in and began playing with little to no interaction. While both

individuals had claimed to be familiar with the previous version of *Scribblenauts*, only Quinn

was able to begin his quest with minimal guidance or prompting. The imbalance in start-up time here could potentially hint that, although girls typically stop and read the directions that are given in that game (as seen in Table 1), boys are more inclined and eager to jump in and get to work; boys may do this because they are more familiar, comfortable, and confident with video games. In order to play the game, the user needs to be comfortable with using both their left and right hands to move the character in the game; not to mention familiarity with the keyboard in order to spell the words necessary to complete the goals. Quinn's familiarity with the game's controls proved to be a positive factor that contributed towards his success as it allowed him to quickly advance through the stage. It took Emily, however, approximately 10-15 minutes to sustain a level of comfort necessary to maintain interest. Other individuals, who may not be as familiar with computer hardware such as the keyboard and mouse, may lose interest in the game because the controls for this game can, at times, become tedious for the inexperienced gamer.

What is interesting about the analysis of data collected throughout this study is that while there are both motivational and gender differences which contribute towards student achievement in video games, some of the differences overlap one another. The findings here correlate to the findings of Gros (2007); in her work, she observed that "gender differences did not influence interest in the games, but do influence different lines of play or preferences (p. 27). This idea not only focuses on the gender issues at hand but also delves into what keeps the player motivated. In this particular study, it was observed that while the boys and girls in the fifth-grade class played the same kinds of games, the frequency and duration of which they played were vastly different. Furthermore, the observations of Quinn and Emily showed that while they were equally excited, motivated, and engaged, Emily lost focus much quicker throughout the course of each gameplay session.

According to one of the teacher responses from the questionnaires, video games would be best used as "an additional center for extra work and support" (Questionnaire, June, 2013). As noted before, this feeling towards games is likely due to the teacher's understanding that video games offer excellent drill-and-practice routines which will allow the student to hone their skills. In order for the centers to run successfully, students would have to be comfortable with their game in order to progress independently, with little prompting or help. For this reason, observations of each individual's independent gameplay was observed and recorded. Quinn, who at the beginning of each session knew exactly where to go to open the game and how to pick up where he left off, could jump from one obstacle to the next with minimal participant/instructor interaction. Emily, however, required the instructor to open the game for her each time and required numerous prompts throughout each session to direct her on where to go. When she got stuck, she would rarely look for any clues and hints that were on the screen to help her. Once she did complete the objective it was generally followed with the question "ok, now where?" The differences in game-playing abilities between Quinn and Emily throughout the sessions were very evident. Essentially, the two were at polar opposites as video game players in terms of proficiency which would explain why they had two different experiences. The male's was generally positive and the female's, while not negative, would be considered more neutral. VanDeventer and White (2002) claim that proficient gamers often exhibit common characteristics such as risk-taking, categorizing, information seeking, critical thinking, and confidence in knowledge. These characteristics are ones not only necessary to be a successful gamer, but an independent one at that; all of these were characteristics observed in Quinn to some extent. Furthermore Blumberg, Rosenthal, and Randall (2008) claim that more frequent players display common characteristics of strategizing and thinking. These are

quintessential components of video games and when a player is unable to strategize or use a certain degree of thinking/problem-solving skills, the likelihood of achieving success in video games are greatly diminished.

Once the data was collected and analyzed three main themes that derived from the sources were that students and teachers hold optimistic views on the integration of video games in education, motivational factors determine success, and gender differences may create a learning curve that affects success. While the general conclusion from the data collected in the study is that video games would play a positive role in the classroom as a new-age teaching tool, there is still much more research and studies that need to be conducted, on a larger scale. The data from this study shows findings that could be the start of something much more.

Implications

At first glance it would appear that the integration of video games into the field of education would pose positive benefits to all parties involved. However, the preceding research found that, in accordance with research previously conducted, there are implications that exist which, if not discussed, would prove detrimental to the successful integration of video games in schools. These elements include the potential problems educators face in order to successfully integrate games into the classroom as well as factoring in the time necessary for students to acquire the ability to play the games. Furthermore, there must be a mutual understanding between researchers, educators, and game developers to determine what makes a video game a successful learning tool. While these two implications show themselves as negative ones, this study found a number of positive implications. This includes the positive benefits video game playing has to develop 21st century skills, which could prove beneficial to those that believe video games provide a stimulating and positive learning environment.

No matter how much research is conducted on the benefits of video games to student learning, there will always remain one obstacle that would prevent successful integration into the classroom; the teachers. It is essential for teachers to both "recognize and map the relationships between activities in the games and the associated learning before they can embed the use of the game within wider learning contexts" (McFarlane, Sparrowhawk, & Heald, 2007, p. 16).   It is with this reason that it is imperative for educators to understand that if video games are to play a role in the classroom, teachers themselves must become students. They must learn the ins and outs of the games to better prepare themselves and their students; video game integration requires confidence with the material and imagination to integrate games into learning tasks.

Furthermore, with regards to the amount of time needed to familiarize them with the game, another issue comes to light is the understanding that not all students bring the same gaming abilities and motivational factors to the table. According to Hamlen (2012), in order to become a "good" video gamer and proficient in video game activities, "efficient video game learners will spend time practicing during concentrated sessions where there is a lot of time available to spend without interruption." (p. 538). If true, this characteristic set forth by Hamlen causes a problem when keeping in mind the day-to-day schedule of classrooms. The implication rests in understanding that there simply may not be enough time in the day to teach individuals the rules and skills required by each game. Gros (2007) proclaims that often, the individuals capable of mastering the game are the same ones that have had prior experiences with said game. The same situation happened in this particular study. Both students, who prior to the testing week, had heard of *Scribblenauts*, Quinn was the only individual to spend time playing the game on his Nintendo DS. In the end, only Quinn appeared to have mastered the game. As related to the concern of time in the classroom to practice with the game, Gros claims that students who

have mastered the game can become tutors for the groups who have greater difficulties. If a teacher is capable of encouraging peer-tutors, it would open the door for a whole new realm of positive opportunities for students as they learn to work as a team, collaborate, and communicate which, again, are some of the essential building block of creating a 21st century learner.

In addition to the discouraging implications of time management within the classroom needed to successfully adopt video games into the curriculum, the findings also suggest that further collaboration is necessary between researchers, educators, and game developers. McFarlane, Sparrowhawk, and Heald (2007) claim that "the greatest obstacle to integrating games use into the curriculum is the mismatch between the skills and knowledge developed in games, and those recognized explicitly within the school system." (p. 16).   In conducting the necessary preparations needed to acquire the findings of this study, a great deal of time was spent attempting to uncover a worthwhile game. The first choice, *Civilization V*, was selected due to its stress on reading, critical thinking, and historical figures. However, as it was played through by the lead researcher, it was apparent that the game, while educational, would serve no purpose in the classroom as it would seemingly take the whole day of instruction to make it through the introduction. In other words, it was clear that the demands of the curriculum within schools would not be met with this particular game and this game is not the only one. There are very few games on the market that offer a fun, interactive, and engaging gameplay while the player is actively learning by doing. According to Bogost (2005), this imbalance happens because the "videogame industry is creatively rich but risk-averse, motivated primarily by wealth and reinforced by its own success. The education establishment is bureaucratic and self-effacing, endorsing the production of complacency over challenge." (p. 119). In order for one of these systems to meet the needs of the other, a significant transformation within one establishment

would be crucial. If researchers and educators are serious about the integration of video games into the schools, then they need to begin to look at smaller independent video game companies that are not in the market to make the next blockbuster videogame.

Findings in this research provided suitable insight into the potential of video games as an educational tool in the classrooms. There were few limitations in the research done for this study. However, because of the time of year in which this study was conducted, students were out of school but were not as accessible as they would be during the school year. Camps, sports, and vacations minimize the window of opportunity available for additional observation. That being said, future research on this topic would need additional observational sessions and perhaps the introduction of multiple games for the purposes of comparing and contrasting genres.

After the completion of research, there were a number of factors that led me to further questioning and consideration, especially in regards to the apparent disconnect between teachers and students. While it seemed as though the majority of teachers were on board with integrating video games, it appeared as though there was not much thought put into how they might integrate the game. According to the teacher questionnaires, it is clear that many of the teachers have experience with free online games that children play in school. However, these are not the sorts of games that this study was looking into. The games the teachers were familiar with required little to no background knowledge or preparation. This observation further intensified the notion that in order for video games to be successfully integrated into the classroom, teachers must be educated on how to use the games as tools in their classroom, not just an extra activity or free-time incentive.

Conclusion

The purpose of this study was to examine research on the effectiveness of integrating video games in the classroom and research gathered from various theoretical interpretations with the common purpose to expose the ability of video games and simulators to facilitate learning. Furthermore, this study used the theory of new literacies, or the 21st century learner, to interpret the research and data in order to decipher whether video games would facilitate learning. What this study found was that video games are, to some degree, conducive to learning. According to Luterbach and Brown (2011), all 21st century learners should: be literate, possess ICT skills, be independent problem solvers, possess social skills, ethical, and have systematic thinking skills. The findings in this study suggest that student interactions with the videogame *Scribblenauts*, successfully touched upon each of these qualities to varying degrees. Games are designed from complex decision-making platforms, capable of reaching out to individuals with various learning styles (Squire, 2006). Video game design is the reason these games are often referred to as vital mechanisms for teaching 21st century skills. These skills are the essential building blocks of what will help an individual become a successful 21st century learner. As time progresses, the technological advancements that are made will help mold our society by placing new demands on a growing population, demands that require a 21st century learner. One way to effectively acquire these skills to meet the demands is through video games.

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Appendix A

Grade:

Civilization V is a turn-based strategy game, where each player represents the leader of a certain nation or ethnic group ("civilization") and must guide its growth over the course of thousands of years. It starts with the founding of a small primitive settlement and ends after achieving one of the victory conditions—or surviving until the number of game turns end, at which point the highest-scoring civilization, based on several factors, is declared the winner. During their turn, the player must manage units representing civilian and military forces: directing units to explore the world, found new cities, go into battle to take over other civilizations, control production in their cities to produce new units and buildings, improve land, handle diplomacy with other civilizations in the game, and finally direct the civilization's growth in technology, culture, food supply, and economics. Victory conditions can include taking over the entire world by force, convincing the other civilizations through diplomacy to acknowledge the player as a leader, building the "Utopia Project" wonder by adopting social policies or winning the space race to build a colony spaceship to reach a nearby planet, or winning from being the most powerful civilization on the globe after a set number of turns.

Using the provided information please answer these questions on a scale from 1-5.
5 for strongly agree. 1 for strongly disagree.

This game could be used as a tool in the classroom to:

Facilitate student learning	0 1 2 3 4 5
Encourage ELA skills	0 1 2 3 4 5
Motivate/Engage students	0 1 2 3 4 5
Help teach certain fundamentals in Social Studies	0 1 2 3 4 5
Integration into the classroom	0 1 2 3 4 5

Do your students currently play any type of digital game in the classroom? Do you believe these games are beneficial to the student?

Appendix B

What are your thoughts on the use of video games in the classroom?

Age:

Gender (Circle One):   Male   Female

Top three favorite video games:
1.
2.
3.

How many days per week do you spend playing video games? (Xbox, PS3, Wii, iPads, and cellphone games)

How many hours each day do you spend playing video games? (Xbox, PS3, Wii, iPads, and cellphone games)

How much do you feel video games influence your 'real' life, if at all?
(0: Video games do not influence me at all   5: Video games influence me a lot)

<center>0   1   2   3   4   5</center>

Do you think the video games that you are allowed to play in school help you learn?
(0: The video games do not help   5: Video games help me a lot)

<center>0   1   2   3   4   5</center>

When you play a game with a lot of directions, dialogue, and reading do you… (Circle one):

1. **Skip all of the reading, I just want to play**

2. **Start to read it, and then skip it because I'm bored**

3. **Read most of reading and sort of understand what was said**

4. **Read all of it because it's important to know how to play**

Appendix C

Observation Rubric - *Scribblenauts*

On task behavior:

- The actively playing the game without stopping, not getting distracted by other things, or talking about off topic subjects
- The student is playing the game but occasionally gets distracted, starts doing other things in the game that are outside the main objective
- The student either refuses to play, is very distracted by something else, continually talks about off topic subjects or gets off topic in the game, acts inappropriately, or all of the before mentioned

Engaged:

- The student is highly interested in the game, they have a lot to say about the game, and/or ask questions or show signs of excitement.
- The student shows a little interest in the game or parts of the game that he/she is playing, they make some comments, and/or ask some questions. They may show some signs of excitement.
- The student has no interest in the game that he/she is playing. They do not comment on the game, or ask any questions. There are no visual or auditory signs of excitement.

Motivation:

- The student is motivated by the goals and objectives within the game and utilizes all components of the game. The player asks questions when needed to help complete their objective.
- The student plays the game but is not interested in earning the prizes the game gives them for completing tasks. When stuck, the player sometimes communicates that they need help to achieve their goal.
- The student shows no sign of being interested in the game. They do not seek out to accomplish the goals and objectives put out by the game and will not communicate any problems with the instructor if they are stuck.

Appendix D

Initials: Age:

Date: Grade:

Quiz: Nouns	
*Theme/Title:	Proper Nouns VS. Common Noun
Nouns can be proper nouns or common nouns. *Common Nouns* refer to a person, place, or thing. *Proper nouns* include the names of **specific** people, **specific** places, and **specific** companies. They are **always** capitalized.	

Read each sentence then select the **proper noun** from the choices given.

1. Our teacher, Ms. Brownley, assigns a lot of homework over the weekend.

    A: over   B: teacher

    C: Ms. Brownley   D: assigns

2. My friend will be going to Journey Middle School next year.

    A: year   B: friend

    C: Journey Middle School   D: next

Read each sentence then select the **common noun** from the choices given.

3. Mandy is going to name her new puppy Toby.

    A: new   B: Mandy

    C: puppy   D: going

4. David wants to travel to many countries when he grows up.

    A: grows   B: many

    C: David   D: countries

5. Even though she is not a little girl, Amber likes to eat Oreos for breakfast.

   A: girl   B: eat

   C: Oreos   D: Amber

Quiz: Adjectives	
*Theme/Title:	Adjective Awareness
* Description/Instructions	
An adjective is a word that modifies a noun or a pronoun. Select the adjective in each sentence.	

Select the **adjective** in the sentence.

6. Juan handled the breakable glasses very carefully.

   A: glasses   B: very

   C: carefully   D: breakable

7. Tanya is a graceful dancer.

   A: graceful   B: is

   C: dancer   D: Tanya

8. The chubby baby clapped his hands excitedly.

   A: his   B: excitedly

   C: chubby   D: clapped

9. Miranda walked with her little sister.

   A: sister   B: little

   C: with   D: walked

10. The children were happily painting colorful pictures.

   A: happily   B: colorful

   C: painting   D: pictures

Spelling Test

1. _____	11. _____
2. _____	12. _____
3. _____	13. _____
4. _____	14. _____
5. _____	15. _____
6. _____	16. _____
7. _____	17. _____
8. _____	18. _____
9. _____	19. _____
10. _____	20. _____

Quiz: Writing

Instructions: Fix the story below using nouns and adjectives to add more detail.

The girl went to the store. She bought some candy. On her way home she ate it. When she got to her house, she went inside.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____