I, Joy Bensiger, hereby submit this original work as part of the requirements for the degree of Doctor of Education in Curriculum & Instruction.

It is entitled:
Perceptions of Pre-service Teachers of Using Video Games as Teaching Tools

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Perceptions of Pre-service Teachers of Using Video Games as Teaching Tools

A dissertation submitted to the Graduate School of the University of Cincinnati in partial fulfillment of the requirements for the degree of Doctor of Education in the Department of Curriculum and Instruction of the College of Education by

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VIDEO GAMES AS TEACHING TOOLS

Abstract

Teachers’ beliefs and perceptions are very critical to the integration of video games in the classrooms. This study was conducted to investigate the perceptions of pre-service teachers in using video games as one of their teaching tools. Along with this initial purpose, the intent was to understand the anticipated barriers involved in integrating video games into the learning environment. A web-based online survey with 50 items was prepared and sent via email using a listserv along with a detailed cover letter and information sheet that explained the research protocol. The results were analyzed using both descriptive and inferential statistics to answer the research questions. This study specifically investigated the following questions: (1) What experience do pre-service teachers have with video games? (2) Do pre-service teachers believe that the use of video games will enhance learning? (3) What barriers, if any, do pre-service teachers foresee in the integration of video games? (4) If provided opportunities, would teachers be willing to integrate video games in their learning environment? Findings from this study indicated that pre-service teachers believe that they have positive experiences playing video games, although they did not play video games on a daily basis. Further, most of the pre-service teachers believed that integration of video games in their classrooms would help their students develop social and academic skills. However, they responded that finding the appropriate educational video games, technical assistance in installation, and the cost of purchasing video games are barriers in the integration of video games. If provided opportunities, however, pre-service teachers expressed that they would be comfortable in integrating video games in their curriculum with the help of school administrators. To implement such technology, it is recommended that pre-
service teachers be provided with adequate training in choosing the appropriate video games and how such technology would enhance learning.
To my mom, wife Rachel
and to our children Karen and Kevin, whose love encourages me daily.
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CHAPTER 1

Introduction

Over the past decade there has been a massive explosion in the popularity of video games (Williams, 2006). In 2003, television network executives admitted that they believed video games had caused a sharp drop in television viewing among the young male demographic. Five out of every ten Americans – about 145 million consumers and employees – play video games in one form or another. Increased use of video games as an entertainment medium provides exciting opportunities to adapt games to educational purposes, addressing instructional goals from within highly interactive virtual environments (Shaffer, Squire, Halverson, & Gee, 2005).

According to Beck (2004), most of the gamers play video games with other family members. These numbers mean that video games are a standard part of American culture. Video games give consumers the freedom to interact and use variety of characters with people everywhere (Beck, 2004). Video games have gone from social predators to the favorites of the media, technology and now educational industries. Educators started to believe in building next-generation learning environments from games (Dalesio, 2004). For years, researchers have discussed the educational potential of video game technology as well as the game play itself (Gee, 2003), and we are beginning to see published research on the use of video games, such as Europa Universalis II and Civilization III, to support instruction in the classroom (Squire, 2005). Research indicates that video games and associated pedagogies work in designed settings. It seems the important question is not whether educators will use games to support learning, but how we can use games most effectively as educational tools (Shaffer, 2005)? The increasing
number of research initiatives, conferences, books, recommendations and software
focused on educational games suggest that computer and video games will play a part in
education, just as all media before them have been used for learning (Cuban, 1986).

Computer technology has already become an integral part of college students’ everyday
lives. Nearly two-thirds of the students said games were a good way to spend time when
friends weren’t around, but they also said that video games didn’t take time away from
family or friends (Weaver, 2011).

Many pre-service teachers have, indeed, learned the basics of computer
technology in previous high school classes or in college courses, some of which are pre-
requisites for graduate degree programs. Instructors often use presentation software (or
handouts of these files) to present lesson objectives and activities. Multiple studies show
that technology integration in the curriculum improves students’ learning processes and
outcomes (Gray, 2001). When pre-service teachers were introduced to computers as
problem-solving tools, it changed the way they perceived teaching (Zhiting & Hanbing,
2001). It was observed that instruction can change from a behaviorist approach to a more
constructivist approach (Beyerbach, Walsh, & Vannatta, 2001). The use of Learning
Management Systems (LMS) such as Blackboard or WebCT is becoming a very common
tool in educational contexts. In order to participate in a course, it has become mandatory
for students to use computers efficiently for their daily activities at school. Most of the
assignments and tests are posted online. Students interact with computer technology on a
regular basis.

As the price of technology continues to drop, computers, digital devices, and
video games have become affordable to schools. The use of computers in classrooms has
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increased tremendously since 1994. According to a survey commissioned by the National Center for Education Statistics (NCES), in 1999, 99% of full-time public school teachers reported that they had access to the Internet at their schools. Out of these, 35% of the teachers reported that they use computers often for preparing their teaching materials (NCES, 2000). This expansion of computer use has remained unabated in the past decade. The educational uses of computers are mostly associated with educational simulations/games and problem-solving techniques (Molenda & Sullivan, 2003).

Video games are considered as one of the software applications that could be used for problem-solving and creating simulations in classrooms. According to a study conducted by the National Endowment for Science Technology and the Arts (NESTA) and Electronic Arts (EA), 59% of teachers surveyed would consider using video games in their classroom for teaching purposes. Computer games have emerged as a popular leisure-time activity for many students (Durkin & Barber, 2002). The majority of them believed that mainstream games can lead to improved skills and knowledge (Orry, 2006).

Playing video games is a kind of literacy that helps us to critique the systems in which we live. Any social or cultural practice can be understood as a set of processes. Understanding each of them can be taught, supported, or challenged through video games. Video games have the power to make arguments, to persuade, and to express ideas. Salen (2008) states that educators should consider adopting video games as artifacts to be discussed in conjunction with traditional media in subjects like literature, language arts, and history. Within the context of a computer-mediated role-playing game, knowledge, skills, and other resources are combined with those of the player (Tea & Lee, 2004). Good video games distribute intelligence and allow players learning experience.
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The features of a good video game are interactivity, customization, strong identities, well-ordered problems that allow the players to make good guesses, mentoring and modeling. Good video games allow people to create order out of complexity, to gain and feel mastery, and to create new autobiographies, careers and histories. Video games create better learning conditions (Gee, 2007).

Historical Background and Growth of Video Games

The evolution of computer games emerged during 1960s. Though few scholars have undertaken empirical studies to explore the actual ways in which games can foster the learning of history, some research conducted in the 1970s into learning outcomes using a variety of non-digital games suggests that the games themselves are less important than the ways in which teachers use the games. There were different types of platforms used for playing video games, such as, home consoles used with television, computers, coin operated arcade machines and handheld devices. Educational games such as “Number Munchers, Math Blaster” “Oregon Trail” and “Carmen Sandiego” were some of the popular video games used in 80’s and 90’s. Video games became a popular leisure-time activity for many students (Durkin & Barber, 2002).

Annette Len (2007) stated that children today operate differently than they did ten years ago. Outside of school, students are multi-tasking with the use of technologies such as instant messaging, cell phones, computers, e-mail, digital music devices, and videogames. According to a report done by the Henry J. Kaiser Family Foundation (2005), multi-tasking is a growing phenomenon among children and teens. Kids spend more time on digital media than watching television. Students who have grown up with interactive technologies integrate them seamlessly in their daily lives.
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Students who are so thoroughly connected to technology outside of school are largely disconnected within their classrooms. Students increasingly express frustration and dissatisfaction with their school experience, and the limited Internet access during the school day. These digital savvy students need learning experiences to be parallel with the exciting and engaging digital formats that they use in other parts of their lives (Bradley, 2005). New methods of teaching strategies become necessary for the teachers in this generation (Prensky, 2001).

The theory of learning embedded in video games fits better with the modern, tech-world that children experience in their daily lives (Gee, 2003). The theory of constructivism describes how the learner constructs knowledge from experience, which is unique to each individual. Students come to school with pre-existing knowledge. Video games could be one of the sources, where children can gather such interesting experiences. According to Vygotsky (1978), with adult guidance, and with the collaboration of peers, the students will be able to solve problems independently. Social development theory promotes learning contexts in which students play an active role in learning. Roles of the teacher and student are therefore shifted, as a teacher should collaborate with his or her students in order to help facilitate meaning construction in students. Learning therefore becomes a reciprocal experience for the students and teachers.

According to the study by Schrader, Zheng and Young (2006), pre-service teachers believed that teachers use games as reward for positive classroom behavior and not as a tool for learning new concepts. Pre-service teachers were not aware of the pedagogical dimensions of video games but rather viewed them simply as rewards. The
study suggested that pre-service teachers should be provided opportunities to expand their awareness of the instructional merit of video games and underlying theoretical foundation of gaming contexts. Studies show that teachers lack the confidence to integrate technology into their lesson plans and update themselves with new technology, especially video games, to help students overcome frustration and lead the students to success (Charsky & Mims, 2008). Teachers should experiment new ways to engage their students. Teachers’ ability to implement new ways of engaging students is influenced by their attitudes and perceptions (Gee, 2003). Gee also believes that there is a need to shape learning and learning environments so that games can be integrated into the school environment.

There are several recent studies on using computer games but very few studies have been conducted on the implementation of video games in education. It is important to determine why video games are generally excluded from curriculum although theoretical understanding of applied gaming in education continues to emerge. There are many obstacles in implementing game-based learning in the classroom (Young Kyun Baek, 2008).

In 2006, 10% of teachers were using videogames in the classroom. The increased use of videogames is the result, in part, of more young teachers, who grew up playing games, recognizing the value of incorporating interactive features into learning. Games involve a lot of problem solving and constructive thinking (Danforth, 2007). According to a national survey conducted by the National Institute on Media and the Family (NIMF), 92% of children and adolescents age 2-17 play video games (NIMF, 2001).
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National Purchase Diary (NPD) groups reported that the retail sale of video games and PC games reached 20.2 billion in 2009 (Riley, 2010).

In the 1980s computer games (or video games as they are often called) became established as a new and significant mass cultural form. It is believed that computer games paved the way for digital imaging (Darley, 2001). In the 1990s, the Internet was released to the public after originally being used to connect college computers and military computers to different networks. Since the Internet was introduced to the public, it became a major part of modern society. Online video and computer games connected hundreds of people across the globe through dedicated servers. This new technology was a revolution in gaming, with online gaming becoming a standard on the PC by the mid-1990s. Studies have shown that the use of video games fosters novel learning outcomes. Squire (2005) found that when teachers used Civilization III in an inner-city school's world history course, students tended to become more engaged in the learning process.

**Problem and Purpose of the Study**

Children in the modern world are familiar with the term video game. The theory of learning embedded in video games fits better with the modern, tech-world that children experience in their daily lives (Gee, 2003). Video games are often reviewed by others in the community before they are published (Selfe, 2007). Video games are often designed for the users to understand the game in a short period of time. Learning takes place instantly in many cases. It is hard to collect information on the number of schools using video games for teaching purposes. Although there are several research studies on video games, relatively few studies have been conducted on the implementation of video games in education (Gredler, 1996).
Vygotsky (1978) discussed that play is a crucial method through which we test ideas, develop new skills, and participate in new social roles. Even though more studies are conducted on video games in education, they are not very popular among teachers. In reality, there are numerous obstacles in implementing game-based learning in the classroom (Young, 2008).

Most studies show that experienced teachers are comfortable using their own teaching styles. New teaching methods become necessary for the teachers in this generation because children come into the learning environment with different learning styles and teachers should be prepared to facilitate their learning. Several learning styles have been adopted in the digital generation (Prensky, 2001).

Teachers’ beliefs and perceptions are very critical to the integration of video games in classrooms. Most teachers do not see the value of educational video games as a communication tool in their classroom, but rather view them simply as rewards (Schrader, Zheng & Young, 2006). As per the study conducted in two schools in Northern California it was found that even though teachers and students had access to equipment and software, they seldom used it (Cuban, Kirkpatrick, & Peck, 2001). Research studies published on the topic of teachers’ flexibility concerning innovation have shown that video games are not used as effectively as they could be due to teachers’ lack of skills or confidence to integrate this technology into their courses. Teachers need to update themselves with new technology especially video games, to help students to overcome frustration and lead the students to success (Charsky & Mims, 2008).

Teachers’ use of new technology as an instructional tool and their ability to implement new ways of engaging students is influenced by their attitudes and perceptions (Gee,
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2003). Thus it is necessary to understand the perceptions of pre-service teachers in using video games in their classroom.

Rationale for Study

Timothy Magner, the director of the Office of Educational Technology at the Department of Education points out that *video games do a better job of gauging a student’s mastery of a subject than actually teaching them a subject* (Yusuf, 2008). In order to improve learning for all students, educational leaders and teachers need to continuously explore new tools for learning (Pensky, 2001). Video games are identified as one of the best tools for teaching in getting the students engaged in the classroom (Gee, 2003). Video games can conceptualize stories, environmental elements, and characters and connect them with the real life that students experience in their daily life (Clark & Ernst, 2009). Administration also plays a vital role in perusing and upgrading the technology used in the classrooms, which involves money and decision-making. They make their own buying decisions and are likely to be dubious about the value of games (eSchool, 2006). Controversial results within the literature concerning video games and their effects on students might also lead teachers to question the effectiveness of these games for educational purposes. All of these considerations could potentially affect the perceptions of teachers, as well as their future plans to use video games in their classrooms. Teachers’ ability to implement new ways of engaging students is influenced by their attitudes and perceptions (Gee, 2003).

Teachers constantly struggle to understand the effective use of video games as instructional tools. Availability of resources, consideration of the curriculum, organizational issues, and technical support are some of the major concerns of pre-service
teaching methods. Since pre-service teachers are future teachers, it is important to understand their beliefs in using new technologies such as video games as one of their teaching tools.

**Research Questions**

The main purpose of this research study is to investigate what experiences pre-service teachers have using video games and what their beliefs are for using video games as a teaching tool. Along with this initial purpose, it is important to understand the anticipated barriers involved in integrating video games into the learning environment.

This study specifically investigated the following questions:

1. What experiences do pre-service teachers have with video games?
2. Do pre-service teachers believe that the use of video games will enhance learning?
3. What barriers, if any, do pre-service teachers foresee in the integration of video games?
4. If provided opportunities, would pre-service teachers integrate video games in the learning environment?

**Definitions of Educational Video Games**

Games are based on the concept of fun (Prensky 2001). The main characteristics of games are that they are enjoyable, voluntary, and involve physical and mental activities that have goals and ways and achieve these goals through moves and actions while obeying the rules of the game. A game involves a sense of competition even if that is with oneself. Educational video games are considered as games that have strong purpose of learning the course materials. It is an electronic medium with all the
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characteristics of a gaming environment and intended educational outcomes targeted for a group of learners. Educational games create a continuous cycle of cognitive disequilibrium and resolution (Van Eck, 2003).

In this study, video games are defined as educational video games. An educational video game is one that is designed for learning with fun. It is a combination of educational content and learning principles (Gee, 2007).

Theoretical Framework

Constructivism is a theory that describes how the learner constructs knowledge from experience, which is unique to each individual. It can be defined as a process of internalization of new experiences through past experiences or previously established knowledge constructs. In theory, constructivism could also mean a holistic approach to teaching by encouraging thinking about the nature of learning rather than direct instruction (Marsh, 2001).

The theory of constructivism describes how the learner constructs knowledge from experience, which is unique to each individual. Students come to school with pre-existing knowledge. Video games could be one of the sources, where children gather such interesting experiences. According to Vygotsky (1978), with adult guidance, and with the collaboration of peers, the students will be able to solve problems independently.

Social development theory promotes learning contexts in which students play an active role in learning. Roles of the teacher and student are therefore shifted, as a teacher should collaborate with his or her students in order to help facilitate meaning construction in students. Learning becomes a reciprocal experience for the students and teachers. According to Piaget, children construct their own knowledge through the processes of
assimilation and accommodation, making new experiences to make sense in accordance with the existing internal constructs. Constructivist writers Brooks and Brooks state that “deep understanding occurs when the presence of new information prompts the emergence or enhancement of cognitive structures that enable us to rethink our prior ideas” (Brooks & Brooks, 1999, p. 16). Greeno (2001) offers yet another definition for constructivism in the form of a mission statement. He states,

   “we need to organize learning environments and activities that include opportunities for acquiring basic skills, knowledge, and conceptual understanding, not as isolated dimensions of intellectual activity, but as contributions to students’ development of strong identities as individual learners and as more effective participants in the meaningful social practices of their learning communities in school and elsewhere in their lives” (Greeno, in Wilson & Lowry, 2000, p. 5).

What Makes a Constructivist Classroom?

In a constructivist classroom, learning is not a linear process. Instead, teachers encourage their students to actively construct their own knowledge, meaning, and interpretations of the world based upon their personal experiences, beliefs, and preexisting knowledge and to modify their understanding in the light of new contexts mostly on the interest of the learner. According to constructivists, learning is an active process in which learners actively construct their own conception of their environment. Gokleksiz (2007) suggests that teachers should be aware of the student-centered instruction to implement new curriculum. Success of a curriculum mostly depends on how the teachers adopt and use it.
Constructivism stresses that knowledge is constructed in children from their own experience. In order to facilitate a constructivist-learning atmosphere, teachers design instructional tasks that embody the essential elements of constructivism. Video games could be tailored into the curricula and they can be used appropriately in the classroom when they fit into ongoing curricular activities (Baek, 2008). Learning activities can help them make connections between present and past experiences. Through the use of such activities as probing questions, defining the problem, acting out the problematic situation, and drawing analogies to real world situations, teachers try to engage their students and make them focus on the instructional tasks. As a next step, teachers provide materials necessary for students’ exploration and inquiry process. Teachers become facilitators and guide students through the learning process. Thus, teachers are no longer active transmitters of knowledge and students are no longer passive receivers of knowledge (Vygotsky, 1978).

Learning activities such as student exploration and inquiry processes require students’ full participation. An important part of the learning process is that students are active. They reflect on and talk about their activities. They create understanding of the concept for themselves. The teacher allows the students to experiment, ask questions, and try things that don’t work. In a constructivist classroom, teachers provide their students with meaningful activities and group processes that encourage them to work collaboratively and cooperatively to solve problems in relevant contexts. Working in groups creates an environment for students to support each other’s understanding of the learning concepts as they articulate their observations, ideas, questions, and hypotheses. Sharing and discussing their learning experiences with their peers help them to overcome
possible misconceptions that might arise during the learning process and enhance their understanding of the concepts better. The cooperative learning opportunities provided by constructivist teachers help students to get an overall comprehension of global interdependencies, multiple perspectives, and different points of views and values. It also helps them to develop the ability to make decisions, think critically and creatively, and synthesize knowledge. In a constructive classroom, students control their own learning through the process of inquiry and reflection on experiences. This way, students become experts in their own learning.

**Video Games Meet Constructivism**

Falance (2001) discusses how followers of constructivism believe in creating environments of learning through cognitive apprenticeships. Learners must interact with experts to experience how they think and solve problems. In many ways today’s commercial games follow this model. Gee (2003) argues that the underlying architecture of commercial games helps foster mastery of content by pushing players to the limits of their abilities, but always staying within those boundaries, creating a sense of both pleasure and frustration. In this way players are motivated to gain new knowledge.

Video games help to create a constructive learning environment for students. This is where constructivism coincides with video games. Mark Wright (2011) stated in his article “Games as Constructivist Learning” that multiple role-playing games like World of War Craft where players are able to work on their own to learn and favors the use of team play provide players an opportunity to not only learn from their immediate peers, but also to interact with players and students all over the world. Teachers therefore
should guide the students in how to apply the learning and provide a safe classroom environment for students to learn new concepts.

Games can help to create a constructivist learning environment for students, and the teacher can become a facilitator of learning rather than a provider of non-contextual information. In order for appropriate learning to occur, the students must have an opportunity to reflect on what they have learned, and must be provided guidance to avoid missing the learning opportunity because they were too distracted by the game content. Teachers must therefore provide guidance to students to understand how to apply the learning that occurred in the game back into the real world, and provide a safe classroom environment for students to explore these new concepts.

The rapid rise of new technologies actually creates greater opportunities for creating constructivist learning environments. The best way to learn something is through authentic interaction. This has always been hindered by limited opportunities for interaction caused by socio-economic realities. However, the increasing availability of computers and the games that drive them creates new opportunities for authentic interaction for all students.

**Limitations of the Study**

The participants of this research study are pre-service teachers from a particular university; therefore, the results cannot be generalized to all pre-service teachers. The survey for the research was an online survey which was sent through email using the College of Education, Criminal Justice and Human Resources (CECH) listserv. There are chances that some of the email addresses may not be current.
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A limitation in the survey methodology comes when examining the responses provided by the participants. Responses for the survey are self-reported; truthfulness and accuracy are dependent upon the participants.
CHAPTER 2

Review of Literature

The review of literature conducted for this research study examined the following as presented in Figure 1: (1) Video games emergence and pedagogy, (2) Video games and learning in terms of constructivist principles, (3) Perceptions and beliefs of pre-service teachers, (4) Barriers and challenges of integration of video games in the classrooms, and (5) Evolving of video games in the future.

Figure 1: Video Games Emergence and Pedagogy

Video games have been around for a long time, but this form of entertainment recently took its place in the mainstream media. While Apple and Microsoft completely revolutionized personal computers, the video game world was already booming when the latter decided to try its hand at the market. The X-Box was the end result, and, while it never gained any kind of notoriety in Japan, it was a huge success in North America and
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helped Western developers such as BioWare to rise to the forefront of the industry. Although Japanese developers still play a big part in the world of video games, North America is now a serious competitor and has forced Nintendo and Sony to reinvent themselves to try to appeal to more gamers. Although the Game Boy was not the first handheld video game system, it was the most popular and important one at the time. In fact, it is still possible to find games for the Game Boy Advance in stores, which is a testament to the format's longevity, considering the original Game Boy was launched at the end of 80’s. Ultimately, the Game Boy is the ancestor to the games on cell phones and other portable devices.

Over a period of time, there are so many new gadgets used in the video game world. It is a good start in figuring out how this emergence happened and how it is still happening. Video games are now a part of the mainstream media. We can see children and adolescents playing them at home, on the bus, and even at school. What is more, we can see adults playing them in the very same places. Research indicates that using video games as an instructional tool can be effective way of getting children to learn and remember new conceptual material very quickly (Gee, 2007). Dr. James Paul Gee presented research on gaming and learning at a New York City MacArthur Foundation seminar. He explained specific ways in which video games have the potential to unleash children’s learning potential.

The video game industry has become very competitive and there is a huge diversity within that industry, there is no end in sight. According to the MacArthur Foundation, 83% of children between ages 8 and 18 play video games and nearly 75% communicate using instant messages (Arias, 2007). Most of the studies on video games
suggest that video games are motivating tools for the kids to learn content effectively. Long (2007) provided examples of how we can effectively use video games as teaching tools. Whether teachers should tie together the video game as a pedagogical tool depends on their attitude towards reality, identity and their belief system. It is not a question about the content, but about what experiences should be valued.

**Perceptions and Beliefs of Pre-service Teachers**

Researchers observed during the 1990’s that pre-service teachers reported little opportunity to see technology use modeled in a college classroom setting by university faculty or in a student-teaching setting by supervising teachers (Marcinkiewicz, 1995). There is evidence that pre-service teachers believe that technology integration is effective for classroom instruction, but the issue is how they prepare themselves to implement a variety of technological tools that enhance learning. In fact, teachers’ practices were often based more on their own personal beliefs about teaching than on the best practices described in the literature (Ertmer, Gopalakrishnan, & Ross, 2000). Some of the factors that may affect teachers’ perceptions regarding the use of video games can be identified as teachers’ characteristics and their flexibility in regard to innovation. Prospective teachers’ decisions to use video games in their courses are somewhat dependent on their flexibility regarding innovation and their awareness of new students’ changing interests. Computers are not used as effectively as they could be in schools (Grabe, 1998). It is believed that most teachers do not know how to use computers to enhance instruction (Heinich & Molenda, 2005).

Educators have seen a recent explosion of initiatives expected to inculcate technology into teacher education programs. One of the conditions contributing to this
effort is the demand in K-12 schools for technologically sophisticated teachers. Although there are several research studies on video games, relatively few studies have been conducted on the implementation of video games in education (Gredler, 1996).

Teachers need to have an interactive session after the game using probing questions and get students to write about what they have experienced, because critical thinking is one of the major factors for effective learning. Teachers need to know and teach to the objectives and make the students realize the need for understanding that particular content. There are few schools trying to adopt video games in their classroom. The Parsons School of Design in New York proposed a new public school with a game-generated curriculum (Wallace, 2008).

Evolving of Video Games in the Future as Teaching Tools

An article published in The Seattle Times (2008) reported that video games could reshape education. Video games involve great discovery that captivates students so much that they will spend hours learning on their own (Feller, 2006).

"Increasingly, many video games—whether role-playing games or real-time strategy games, educational games or commercial games—have found new ways of synthesizing interactive narrative with historical narrative. Historical supplements now appear in many games, and though enterprises like the Educationa Arcade and Mussy Lane, educators have begun to collaborate more closely with game developers, a partnership essential to the success of game-based learning. Video games, they found, need not replace teachers. Infact, they give teachrs new importance as guides for counterfactual inquiry, helpting students to examine their motives in making decisions and framing the contrast
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between game events and historical events as in contingency" (Brown, 2008, p. 135).

Annetta (2008) suggests that more empirical research be done on why and how games can impact students. She says it is critical that game makers need to band together to make educational video games. Some history books may not deliver content in an exciting way, and while video games can provide excitement, they often don’t have the right content. But it is interesting to see the variety of educational games introduced in the educational system for effective learning.

The Seattle Times (2006) reported that video games are engaging, can teach higher-order skills, and are especially attractive to today’s young digital minds that have grown up with digital technology. In the same article, a group of scientists and software professionals recommended implementing educational video games in classrooms to help students develop strategic thinking, problem solving and analytical skills (Nyhan, 2006).

The George Lucas Educational Foundation funded a poll to measure how respondents felt about using video games in the classroom. Kids aged 8–18 spend about 50 minutes per day playing video games. The average adult male spends 7.6 hours per week playing video games, and the average adult female spends 7.4 hours per week. Thirty-five percent of computer and video game players are under 18 years of age, the age at which they participate in elementary and secondary education and 43 percent of game players are 18–49 years of age.

Barnard (2006) conducted a poll for Edutopia, an education website, posing the question, “Are computer and video games effective teaching tools?” The results reported that 78% of respondents (391 votes) said that “Computer and video games engage,
VIDEO GAMES AS TEACHING TOOLS

motivate, and inspire students, and educational researchers and game designers are collaborating to create their ideal niche in the classroom.” Twenty-two percent of respondents (110 votes) said that “Using electronic games in the classroom is not the best thing for students simply because games are part of the world they grow up in. Educational video games should be judged, critiqued, and proven before they're used in class”.

Carvin (2008) states that course materials should have connection with the real world situation, otherwise it will be difficult to learn. He suggests that video games could be used to help students to understand and learn the curriculum better. Video games are one of the most powerful learning tools ever invented (Etuk, 2008). Multimedia and video games could develop learning skills in children.

Gee (2003) states that all learning in all domains requires identity work. He adds that video games can help students to find new identities and help them to distinguish with other identities they already formed. He also adds that modern video games teach players to think about complex worlds, and how the games affect their daily lives. Gee strongly believes that these lessons are particularly valuable in social settings like schools and workplaces. Researchers who gathered in Boston for the American Psychological Association convention detailed a series of studies suggesting video games can be powerful learning tools (Leblanc, 2008). Fran Blumberg, researcher and psychologist from Fordham University said, “The younger kids are focusing more on their planning and problem-solving while they are actually playing the game, while adolescents are focusing less on their planning and strategizing and more on the here and now”. (Leblanc, 2008).
Watts and Gwinn (2007) suggested that pre-service teacher preparation and in-service teacher professional development of literacy-technology integration requires more than a focus on the information and communication technologies themselves. It is found that teachers who effectively integrate literacy instruction with technology are able to distinguish among motivation, engagement and learning, keeping their eyes trained on the ultimate goal of learning. With the help of modern video games, there are now more opportunities for teachers to engage with their students.

Kids are playing new worlds of games that were once published as science fiction. It is more like playing in a rich movie environment that reacts, responds, and waits for one to talk, build and act. And many kids today have this capability with game systems and computers at home. Many young people play Halo and other games on Xbox live in their living rooms; they play and learn with kids from all over (Dubbels, 2007). Video game designers have created such compelling experiences that children will go and spend hours trying to figure out (Etuk, 2008).

Forcier and Descy (2005) found that games can be fun and motivating, and many times students are not aware of the learning that is taking place. Gaming can be found in all computer-assisted instruction categories. The technique includes a set of rules and a clear contest. Students may compete against each other or against the computer or another fixed standard. Instructional games may be combined with any number of formats, such as drill and practice, simulations or problem solving. Most computer games are highly competitive, either with another player or with the computer, and many introduce the elements of speed or time. In most cases they involve some type of fantasy atmosphere. Online virtual connections with students allow instructors to monitor
students’ progress continuously and to individualize their learning. Orey, McClendon, and Branch (2005) stated that conducting ongoing, interactive virtual conversation with students enhances the mentoring process. It enables instructors to differentiate and be supportive of students’ diverse learning needs.

The British Broadcasting Corporation (2000) reported a study conducted by Sony Play station on how video games are used by young children ages 13 and 14. The study discovered that more than three-quarters absorbed facts contained in a historical video game as opposed to just more than half who are presented with the same information in a written form. It was concluded that teenagers learn more from video games than they do from books. Modern teenagers are easily able to make sense of fast-moving images in a way that would probably leave their parents puzzled. Today’s teenagers can easily understand rapid, jump cuts from one topic to another and also unusual visual perspectives.

Brooks and Brooks (1999) stated that educators must invite students to experience the world’s richness, empower them to ask their own questions and seek their own answers, and challenge them to understand the world’s complexities. Learning how to use an application software package effectively involves time and practice. Now almost all schools have started using computers as one of the teaching tools, and most of the classrooms in the U.S. are equipped with computers. It is no longer an unfamiliar thing for students and teachers (Coller & Shernoff, 2009). Students who play video games are more engaged with their work. There are various applications and software, which are used to enhance teaching and learning. Understanding these software applications increases computer literacy and helps one to understand how this knowledge can help
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after students finish their schooling and go to work (Gee, 2003). Extensive research conducted over a period of more than 20 years clearly confirms that the effective integration of interactive multimedia applications into curriculum can revolutionize the way students learn their subjects.

According to Hickey and Kindfiled (1999), computer access in the classroom enhances the teacher’s ability to use the technology-supported curriculum to support meaningful learning.

A student, in this virtual world, brings enormous knowledge to the schools. Most of their knowledge is acquired through social activities. Video games and other digital environments play a major role in their attitudes and behaviors. With video games and computers, students choose what to learn. It makes them happy and makes them think positively.

Video game playing could be associated with improvements in cognitively relevant tasks (Ferguson, Cruz, & Rueda, 2008). Video games and simulations help the users to collaborate with other users and work as a group. Team-based learning helps the learners to understand things in shorter amount of time. With the help of modern communication, one player can contact and play with another player across the globe instantly. Towne (1995, p. 68) stated that “in few years there will be a wide range of learning possibilities that permit collaboration with other learners and access to expert instruction, while retaining the freedom to choose the time or the place, or both. Individuals will be able to participate in instructor-led tours and explore interesting topics while retaining the abilities to make private excursions into virtual worlds to interact with fellow learners and to have an individualized dialog with the instructor”.

25
VIDEO GAMES AS TEACHING TOOLS

Traditionally, video games have been regarded as having a negative impact on children’s physical activity. The study by McDougall and Duncan (2008) found that active video games may provide viable alternatives to traditional physical activity. Video games help children to achieve the recommended daily physical activity. Computer gaming and violent socialization are not inextricably linked: they are discrete components of a complex culture undergoing rapid technological and social change during an era of unprecedented global transformation (Selfe, 2007).

Barriers and Challenges in the Integration of Video Games in Classrooms

Teachers must continuously update their technology and technology integration skills. Today, teachers have an incredible responsibility compared to any previous generations of teachers. The amount of knowledge that teachers must instill in their students is enormous and continues to expand at a phenomenal rate. The current emerging technologies help teachers to make a difference in the quality of their students. Teachers can use and integrate technology to influence future generations in immensely positive ways.

There are various factors that affect the use of computers and video game enabled classrooms, such as broken computers, low number of computers, insufficient space, classroom scheduling conflicts, seating arrangements in the class and inadequate seats. This becomes a major factor in implementing and experimenting technology enabled classrooms. Also the administration and the school standards play a major role in creating a modern innovative learning environment.

Teachers are responsible to take necessary steps for implementing technology in the classroom. They should be in the driver’s seat, making decisions about technology
integration on their teaching, based on their students’ knowledge and their understanding of teaching and learning (Bennett, 1999). Changes in teachers’ knowledge and classroom practice can improve student learning (McCutchen, et al., 2002). With that in mind, it is appropriate to find the perception of the pre-service teachers about their intention to use technology in the classroom. While bombarded with promises of tomorrow's technology, many teachers are struggling to make efficient and effective use of today's technologies (Planow, Bauder, & Carr, 1993). Is it because teachers do not believe in technology or they are not taught technology-related courses in their pre-service training?

Even though video games are considered as another recreational activity for students, they are identified as an addictive or isolating activity. Also children who play violent video games frequently will have a different perception of violence and its consequences (Video Game Addiction, 2012). Parents should be aware of these issues. Children who play video games aggressively may be getting less exercise and develop poor eating habits. Teachers need adequate training and experience in choosing the right video games for their students.

School administration also plays a vital role in the implementation of video games. Each school makes their own buying decisions and some are likely to be dubious about the value of games. This study adds to the literature of how pre-service teachers perceive the use of video games in their classrooms.
CHAPTER 3

Methodology

This chapter describes the participants, the survey instrument, the development of the survey instrument and the procedures used for data collection.

Participants

The study used a convenience sampling method to recruit participants. The participants were pre-service teachers enrolled in four pre-service programs (Early Childhood, Special Education, Middle, and Secondary Education) in the College of Education, Criminal Justice and Human Resources (CECH) at the University of Cincinnati. The pre-service teachers were contacted using the College of Education online database (listserv). Using the listserv, the online survey consisting of 50 questions was sent to pre-service teachers enrolled in the program.

The goal of their programs is to offer students experience with pedagogy of teaching, including the use of instructional technology. Graduates are expected to be able to integrate a variety of technologies into their teaching. A consent form explaining the purpose of the study and soliciting the student’s willingness to complete the survey was delivered and administered to the participating students in the pre-service program.

There were 75 pre-service teachers who participated in the study (Table 1). Out of the 75 pre-service teachers, 24 were from Secondary Education, 18 were from Early Childhood, 15 were from Middle School, 14 were from Special Education and 4 were from other programs (see Table 1).
Table 1

*Participants' Details and Pre-service Programs*

<table>
<thead>
<tr>
<th>Participants Information</th>
<th>Pre-service Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Numbers</td>
</tr>
<tr>
<td>No. of surveys emailed</td>
<td>140</td>
</tr>
<tr>
<td>Early Childhood teachers</td>
<td>18</td>
</tr>
<tr>
<td>Special Education teachers</td>
<td>14</td>
</tr>
<tr>
<td>Middle School teachers</td>
<td>15</td>
</tr>
<tr>
<td>Secondary School teachers</td>
<td>24</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
</tr>
<tr>
<td>Total surveys completed</td>
<td>75</td>
</tr>
</tbody>
</table>

*Note: n = 75*

Most of the pre-service teachers were from the Secondary School program, followed by Early Childhood and Middle School programs. The age range for this research study was less than 20 years to more than 35 years. A majority of the participants (62.7%) were between 20 to 25 years old (see Table 2 & Figure 2).
Table 2

Participants’ Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Early Childhood</th>
<th>Special Education</th>
<th>Middle</th>
<th>Secondary</th>
<th>Others</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 20 years old</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>-</td>
<td>12.0%</td>
</tr>
<tr>
<td>20 - 25 years old</td>
<td>15</td>
<td>5</td>
<td>9</td>
<td>14</td>
<td>4</td>
<td>62.7%</td>
</tr>
<tr>
<td>25 - 30 years old</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>-</td>
<td>12.0%</td>
</tr>
<tr>
<td>30 - 35 years old</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>5.3%</td>
</tr>
<tr>
<td>More than 35 years old</td>
<td>-</td>
<td>6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8.0%</td>
</tr>
</tbody>
</table>

Note: n=75
Out of 75 total participants, 54 were female and 21 were male. This is due to the fact that most participants in the program were female students (see Table 3).

Table 3

Participants’ Gender

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>Female</td>
<td>54</td>
<td>72</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note: n = 75*
Survey Instrument

A survey instrument was developed to determine the perceptions of pre-service teachers regarding using video games as teaching tools. The questions were developed in accordance with technology use in education. Three faculty members who are knowledgeable in this field examined the instrument. Suggestions from these experts were incorporated in the final version of the instrument.

The final survey included 38 statements (see Appendix D) that focused on the perceptions of pre-service teachers in using video games as teaching tools. Each item used a Likert scale ranging from 1-5 (Strongly Agree, SA = 1; Agree, A = 2; Neutral, N = 3; Disagree, D = 4; Strongly Disagree, SD = 5).

Some of the negative items in the survey were reversed from the overall direction of the scale. The reversed items were transformed with the Likert scale 5-1 (Strongly Agree, SA = 5; Agree, A = 4; Neutral, N = 3; Disagree, D = 2; Strongly Disagree, SD = 1). There were two negative questions in the survey that were reversed to get the accurate result. These negative questions were asked purposely by the researcher as a checkpoint to validate the reliability of responses.

The other twelve (12) statements were designed to obtain the demographic information of the pre-service teachers. The demographic information included age, gender, ethnicity, program enrolled, and experience in playing video games.

Items in the survey were organized into four sections for analysis: (1) Personal experiences with video games, (2) Beliefs about whether or not video games enhance learning, (3) Barriers in integrating video games (4). Personal willingness to implement video games. Here are the details of the four sections of the survey:
Section 1:

The focus of this section of the survey was to find out the personal and prior experiences of pre-service teachers with the use of video games in their daily life. In addition, this assessed pre-service teachers’ preference of video games played by their friends and family members.

Section 2:

This section was framed in a way that pre-service teachers were able to provide information on their video game experience at their work environment. The schools are considered as the working environment for the pre-service teachers. Also, these questions were developed for gauging whether pre-service teachers believe that integrating video games would enhance their teaching ability.

Section 3:

The focus of this section was to study the issues and obstacles that pre-service teachers may come across if they use video games as one of their teaching tools. Also, it addresses the support they get in schools both from technical staff and the schools’ administration. This section also focused on financial issues, time consumption, choosing the right video games, workload, and how comfortable pre-service teachers are in discussing the issues with their supervisors.

Section 4:

The focus of this section was to assess pre-service teachers’ willingness to implement video games.
**Instrument Validity and Reliability**

The researcher used face validity measures for the survey. Items on the survey were examined by faculty members who are familiar with the use of technology in schools. The reviewers were requested to rate the statements for their appropriateness with the research questions. All items showing agreement among reviewers were included in the final instrument. The reviewers proposed no further changes to the instrument and the survey was emailed to the participants using the CECH listserv.

Errors in survey design are most often associated with sampling, coverage, non-response, and what is actually being measured (Shannon, et al, 2002). To ensure the survey instrument was reliable, a sample of the data was tested using the Cronbach’s Alpha statistical test. A reliable test should minimize the measurement error so that the error is not highly correlated with the true score. On the other hand, the relationship between true score and observed score should be strong. Cronbach’s Alpha examines this relationship, which is a numerical coefficient of reliability. Co-efficient scores of 80 or more were considered reliable. The overall co-efficient score of the survey was 88.

**Data Collection Procedure**

The survey was generated using a secured software program (http://www.surveymonkey.com) suggested by the University of Cincinnati. The data were collected using the CECH email listserv, a databank that keeps the pre-service teachers’ contact information. The email message sent to the participants included the cover letter (see Appendix B) and the information sheet (see Appendix C) approved by the Institutional Review Board, at the University of Cincinnati. The survey (Appendix D) was made available to the participants online and kept active for six weeks.
The survey was sent as an embedded link within an email explaining the research study (Appendix D). The email included an information sheet file that explained that by participating in the survey, the subject is granting their consent. There was no recruitment incentive provided other than the fact that by participating, the subject would be contributing to a body of knowledge found worthy within educational research. To ensure confidentiality, email addresses were sent using the college listserv. No names or address of the participants were collected. The researcher has no access to contact the participants, as the collected data has no email id other than the IP address of the computer used for taking the survey. Two reminder emails were sent to the participants every other week with the cover letter and the information sheet. As per the protocol, the primary investigator will destroy the data three months after the study is completed.

After completing the survey, the participants were prevented from accessing the survey link. The software contained an embedded tool to prevent any participant from completing more than one survey.
DATA ANALYSIS PROCEDURES

The Statistical Package for the Social Sciences (SPSS) was used to analyze the quantitative data. The data were exported from the survey collection software program as a Microsoft Excel file. The data were then imported to a statistical package for research software program (SPSS) for analysis. Both descriptive and inferential statistics were used to evaluate the results. Frequencies, multiple regression analysis and analysis of variance (ANOVA) procedures were used to calculate the significance of the items in the study.

Each question was analyzed individually for reporting purposes to avoid any statistical error. In addition, the questions were later combined in each section as string values for finding out the cumulative results. This helped the researcher to accurately report the results and answer the research questions. Cross tabulations were also used to better understand the dependent and independent variables. Knowing whether a relationship in survey items is strong enough or not strong enough to answer the research questions is very important in any survey. With that in mind, correlation analyses were also made between important survey items. The data were coded using the 5-point survey rating scale (1=Strongly Agree; 2=Agree; 3=Neutral; 4=Disagree; 5=Strongly Disagree).
CHAPTER 4

Results

The purpose of this research study was to investigate the perceptions of pre-service teachers in integrating video games as one of their teaching tools in the classroom. More specifically the study focused on four research questions.

1. What experiences do pre-service teachers have with video games?
2. Do pre-service teachers believe that the use of video games will enhance learning?
3. What barriers, if any, do pre-service teachers foresee in the integration of video games?
4. If provided opportunities, would pre-service teachers integrate video games in the learning environment?

The research study was designed to test the following hypotheses:

Hypothesis 1: Pre-service teachers have no experience in playing video games.
Hypothesis 2: Pre-service teachers believe that video games will not enhance learning.
Hypothesis 3: Pre-service teachers foresee barriers in the integration of video games in their classrooms.
Hypothesis 4: If provided opportunities, pre-service teachers would not implement video games in their learning environment.
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To answer the research questions, the items in the survey were grouped into four sections (see Table 4). For reporting purposes, fourteen items in the survey were identified and grouped into a single variable as section 1, nine items into section 2, ten into section 3, and nine into section 4.

Table 4

_Categorization of Survey Items by Sections_

<table>
<thead>
<tr>
<th>Category</th>
<th>Survey Item Number</th>
<th>Total Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 25, 26</td>
<td>14</td>
</tr>
<tr>
<td>Section 2</td>
<td>13, 14, 15, 16, 17, 18, 20, 27, 28</td>
<td>9</td>
</tr>
<tr>
<td>Section 3</td>
<td>29, 30, 31, 32, 33, 34, 35, 36, 37, 38</td>
<td>10</td>
</tr>
<tr>
<td>Section 4</td>
<td>19, 21, 22, 23, 24, 34, 36, 37, 38</td>
<td>9</td>
</tr>
</tbody>
</table>

*Note: See Appendix D for the complete survey items.*

In Table 5, the statistical summary of participants and their average responses to the questions in each section is documented.
Table 5

Summary of Responses by the Pre-Service Teachers

<table>
<thead>
<tr>
<th>Section</th>
<th>Early Childhood</th>
<th>M</th>
<th>SD</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1</td>
<td>18</td>
<td>3.21</td>
<td>0.58</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>3.10</td>
<td>0.46</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>3.29</td>
<td>0.68</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>3.14</td>
<td>0.60</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3.02</td>
<td>0.95</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>3.17</td>
<td>0.60</td>
<td>0.07</td>
</tr>
</tbody>
</table>

| Total     | 2.80 | 0.72 | 0.09 |

| Section 2 | 17 | 2.91 | 0.64 | 0.16 |
| Special Education | 12 | 2.58 | 0.50 | 0.14 |
| Middle      | 15 | 2.71 | 0.59 | 0.15 |
| Secondary   | 23 | 2.86 | 0.86 | 0.18 |
| Others      | 3  | 3.13 | 1.36 | 0.78 |
| Total       | 70 | 2.80 | 0.72 | 0.09 |

| Section 3 | 17 | 2.74 | 0.46 | 0.11 |
| Special Education | 12 | 2.65 | 0.26 | 0.08 |
| Middle      | 15 | 2.86 | 0.37 | 0.10 |
| Secondary   | 23 | 3.02 | 0.36 | 0.08 |
| Others      | 3  | 3.00 | 0.36 | 0.21 |
| Total       | 70 | 2.85 | 0.39 | 0.05 |

| Section 4 | 17 | 2.64 | 0.64 | 0.15 |
| Special Education | 12 | 2.36 | 0.61 | 0.18 |
| Middle      | 15 | 2.69 | 0.52 | 0.14 |
| Secondary   | 23 | 2.84 | 0.76 | 0.16 |
| Others      | 3  | 3.21 | 1.06 | 0.61 |
| Total       | 70 | 2.69 | 0.69 | 0.08 |

Note: n’s range from 69-74 due to missing data.

What Experiences do Pre-service Teachers Have with Video Games?

Table 6 reports the responses of participants to the 14 items in Section 1 on a 5-point Likert scale ranging from 1(strongly agree) to 5 (strongly disagree). The \( \chi^2 \)
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goodness-of-fit test results indicate significant differences in response, indicating that the level of experience with video games differs considerably among the study participants.

Table 6

*Pre-service Teachers’ Responses on their Experience in Using Video Games*

<table>
<thead>
<tr>
<th>Survey Items</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>n</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>14</td>
<td>8</td>
<td>27</td>
<td>21</td>
<td>75</td>
<td>22.00**</td>
</tr>
<tr>
<td>2</td>
<td>18</td>
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<td>10</td>
<td>7</td>
<td>76</td>
<td>24.92**</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>17</td>
<td>27</td>
<td>23</td>
<td>7</td>
<td>76</td>
<td>29.26**</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>42</td>
<td>16</td>
<td>2</td>
<td>0</td>
<td>75</td>
<td>74.93**</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
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<td>15</td>
<td>2</td>
<td>0</td>
<td>75</td>
<td>68.53**</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>22</td>
<td>16</td>
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<td>10.40**</td>
</tr>
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<td>7</td>
<td>5</td>
<td>10</td>
<td>33</td>
<td>23</td>
<td>5</td>
<td>76</td>
<td>40.31**</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>13</td>
<td>5</td>
<td>26</td>
<td>26</td>
<td>75</td>
<td>29.73**</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
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<td>26</td>
<td>9</td>
<td>74</td>
<td>44.37**</td>
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<tr>
<td>10</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>15</td>
<td>56</td>
<td>73</td>
<td>157.34**</td>
</tr>
<tr>
<td>11</td>
<td>0</td>
<td>1</td>
<td>9</td>
<td>20</td>
<td>43</td>
<td>73</td>
<td>86.65**</td>
</tr>
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<td>26.71**</td>
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<td>26</td>
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<td>14</td>
<td>4</td>
<td>36</td>
<td>15</td>
<td>69</td>
<td>56.58**</td>
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</tbody>
</table>

*Note: n’s range from 69-76 due to occasional missing data. \( \chi^2 \) = chi-square, Critical \( \chi^2 \) for 4 degrees of freedom = 13.28, **p< .01.*

With participants’ experience levels found to be significantly different, it would be interesting to test whether the pre-service teachers have experience in playing video games. To test this, the following null and alternative hypotheses were used:

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VIDEO GAMES AS TEACHING TOOLS

H₀: μ = 4.5 (participants have no experience), H₁: μ ≠ 4.5 (participants have experience).

The test value of 4.5, signifying no experience, is the average of the point values for the “disagree” and “strongly disagree” responses on the Likert scale.

The results of the t-test reported in Table 7 indicates that the average experience level that pre-service teachers have with video games is statistically significant (M = 3.17, SE = 0.069), t (74) = -19.2, p<.01. Based on these results, we reject the null hypothesis of no experience, and conclude that pre-service teachers have experience in playing video games.
Table 7

\textit{t-test for Average Experience Level}

<table>
<thead>
<tr>
<th></th>
<th>(n)</th>
<th>(M)</th>
<th>(SD)</th>
<th>(SE)</th>
<th>(t)</th>
<th>(df)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1</td>
<td>75</td>
<td>3.17</td>
<td>.598</td>
<td>.069</td>
<td>-19.20</td>
<td>74</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note: Scale: 1= Strongly Agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Strongly Disagree
Test Value = 4.5

The chi-square test and the \(t\)-test results reported thus far indicate that: (i) pre-service teacher’s average experience playing video games is different from zero, \textit{i.e.}, they have experience, but (ii) they differ significantly with respect to their individual level of experience with video games. As a logical next step, it would be interesting to analyze whether the difference in experience level is more pronounced between or across the different education groups.

A one-way analysis of variance (ANOVA) test was used to examine whether there is significant difference in experience level between the pre-service programs (see Table 8). The results suggest that there is no significant difference in the average experience level between the pre-service programs, \(F\) (4, 70) = .295, \(p = .880\).

Table 8

\textit{One-Way ANOVA: Video Game Experience Level Across the of Pre-service Programs}

<table>
<thead>
<tr>
<th>Pre-service programs</th>
<th>Sum of Squares</th>
<th>(df)</th>
<th>Mean Square</th>
<th>(F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>.440</td>
<td>4</td>
<td>.110</td>
<td>.295</td>
</tr>
<tr>
<td>Within Groups</td>
<td>26.099</td>
<td>70</td>
<td>.373</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.539</td>
<td>74</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\textit{Note:} \(n\)’s range from 69-74 due to occasional missing data.
Further examination of the items in section 1 reveals that pre-service teachers do not play video games on a daily basis or for learning for new concepts. Interestingly, over 43.4% of the participants reported that they are not sure that they like their friends or family members playing video games on a regular basis. And over 69% of the respondents do not like their family members playing video game on regular basis. Pre-service teachers enjoy playing video games occasionally to relieve tension or stress. However, 76% of the pre-service teachers reported that they have positive experiences in playing video games and they play for fun. Also it is interesting to note that most of pre-service teachers use consoles such as Play Stations, Wii, and X-Box as their devices for playing video games (see Figure 3).

*Figure 3: Devices Used by Pre-service Teachers for playing video games.*
Do Pre-service Teachers Believe That Video Games Would Enhance Learning?

To understand the belief of pre-service teachers on whether video game would enhance learning, 9 items grouped in Section 2 on a 5-point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree) were analyzed.

The chi-square test (see Table 9) and the t-test (see Table 10) results reported below indicate that: (i) Pre-service teachers differ significantly in their belief about whether or not video games enhance learning, and (ii) On an average pre-service teachers believe that video games enhance learning, \( M = 2.80, SE = 0.085 \), \( t(69) = -19.85, p<.01 \). As a logical next step, it would be interesting to see whether the difference in beliefs is more pronounced between or across the different education groups.
Table 9

*Pre-service Teachers’ Responses on their Belief on Video Game Enhancing Learning*

<table>
<thead>
<tr>
<th>Items Section 2</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>n</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>6</td>
<td>23</td>
<td>14</td>
<td>18</td>
<td>9</td>
<td>70</td>
<td>13.28**</td>
</tr>
<tr>
<td>14</td>
<td>11</td>
<td>34</td>
<td>18</td>
<td>6</td>
<td>1</td>
<td>70</td>
<td>47.00**</td>
</tr>
<tr>
<td>15</td>
<td>6</td>
<td>12</td>
<td>18</td>
<td>23</td>
<td>11</td>
<td>70</td>
<td>12.42**</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>14</td>
<td>22</td>
<td>19</td>
<td>10</td>
<td>67</td>
<td>18.44**</td>
</tr>
<tr>
<td>17</td>
<td>0</td>
<td>3</td>
<td>45</td>
<td>9</td>
<td>10</td>
<td>67</td>
<td>98.29**</td>
</tr>
<tr>
<td>18</td>
<td>0</td>
<td>9</td>
<td>21</td>
<td>29</td>
<td>11</td>
<td>70</td>
<td>36.00**</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>34</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>69</td>
<td>50.20**</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>8</td>
<td>20</td>
<td>23</td>
<td>18</td>
<td>70</td>
<td>24.14**</td>
</tr>
<tr>
<td>28</td>
<td>14</td>
<td>38</td>
<td>13</td>
<td>5</td>
<td>2</td>
<td>70</td>
<td>57.28**</td>
</tr>
</tbody>
</table>

*Note:* n’s range from 67-70 due to occasional missing data $\chi^2 = $ Chi Square, Critical $\chi^2$ for 4 degrees of freedom = 13.28, **p<.01

Table 10

*t-test for Average Experience Level*

<table>
<thead>
<tr>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>SE</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>2.80</td>
<td>.715</td>
<td>.085</td>
<td>-19.85</td>
<td>69</td>
<td>.000</td>
</tr>
</tbody>
</table>

*Note:* Scale: 1= Strongly Agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Strongly Disagree

Test Value = 4.5

A one-way ANOVA test was used to examine whether there is significant difference in experience level between the pre-service programs. As reported in Table 11, no significant differences were found in the beliefs of pre-service teachers across the pre-
service programs $F (4, 65) = 0.636, p = .638$. Together with the t-test results, we conclude that pre-service teachers in all pre-service programs agree that video games enhance learning.

Table 11

*One-Way ANOVA: Video Games Enhance Learning Across Pre-service Programs*

<table>
<thead>
<tr>
<th>Pre-service programs</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 2 Between Groups</td>
<td>1.332</td>
<td>4</td>
<td>.333</td>
<td>0.636</td>
</tr>
<tr>
<td>Within Groups</td>
<td>34.019</td>
<td>65</td>
<td>.523</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35.351</td>
<td>69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* n’s range from 69-74 due to missing data.

Figures 4 and 5 illustrate pre-service teachers’ beliefs on integrating video games in the classrooms and whether they enhance their teaching ability.

*Figure 4: Importance of Integrating Video Games*
What barriers, If any, Do Pre-service Teachers Foresee in the Integration of Video Games?

To understand the barriers that pre-service teachers foresee in the integration of video games, 9 survey items were grouped in Section 3 and the responses analyzed.

The chi-square test (see Table 12) and the t-test (see Table 13) results reported below indicate that: (i) Pre-service teachers differ significantly in their perception about the existence of barriers in video game integration, and (ii) On an average, pre-service teachers foresee barriers in the integration of video games in their learning environment $t(69) = -39.26, p<0.01$. It would be interesting to see whether the difference in beliefs is more pronounced between or across the different education groups.
Table 12

Pre-service Teachers’ Responses on the Barriers of Video Games

<table>
<thead>
<tr>
<th>Items</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>n</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>8</td>
<td>32</td>
<td>22</td>
<td>6</td>
<td>1</td>
<td>69</td>
<td>47.59**</td>
</tr>
<tr>
<td>30</td>
<td>4</td>
<td>11</td>
<td>32</td>
<td>16</td>
<td>5</td>
<td>68</td>
<td>38.02**</td>
</tr>
<tr>
<td>31</td>
<td>6</td>
<td>16</td>
<td>36</td>
<td>8</td>
<td>3</td>
<td>69</td>
<td>51.36**</td>
</tr>
<tr>
<td>32</td>
<td>6</td>
<td>21</td>
<td>32</td>
<td>9</td>
<td>1</td>
<td>69</td>
<td>45.71**</td>
</tr>
<tr>
<td>33</td>
<td>9</td>
<td>19</td>
<td>25</td>
<td>18</td>
<td>6</td>
<td>70</td>
<td>26.42**</td>
</tr>
<tr>
<td>34</td>
<td>2</td>
<td>19</td>
<td>21</td>
<td>28</td>
<td>2</td>
<td>70</td>
<td>43.51**</td>
</tr>
<tr>
<td>35</td>
<td>0</td>
<td>32</td>
<td>21</td>
<td>10</td>
<td>1</td>
<td>69</td>
<td>46.29**</td>
</tr>
<tr>
<td>36</td>
<td>1</td>
<td>14</td>
<td>21</td>
<td>31</td>
<td>3</td>
<td>70</td>
<td>44.85**</td>
</tr>
<tr>
<td>37</td>
<td>5</td>
<td>34</td>
<td>15</td>
<td>11</td>
<td>2</td>
<td>67</td>
<td>47.25**</td>
</tr>
<tr>
<td>38</td>
<td>10</td>
<td>21</td>
<td>23</td>
<td>8</td>
<td>6</td>
<td>68</td>
<td>18.02**</td>
</tr>
</tbody>
</table>

Note: n’s range from 67-70 due to occasional missing data. \( \chi^2 \) = Chi Square, Critical \( \chi^2 \) for 4 degrees of freedom = 13.28, **p< .01

Table 13

t-test for Average Perceptions on Barriers in Video Game Integration

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>SE</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 3</td>
<td>70</td>
<td>2.85</td>
<td>.391</td>
<td>.046</td>
<td>-35.26</td>
<td>69</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note: Scale: 1= Strongly Agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Strongly Disagree

Test Value = 4.5
The one-way ANOVA test results reported in Table 14 below indicate no significant difference between the pre-service education groups as regards their beliefs about barriers foreseen in the integration of video games in their learning environment, $F(4,65) = 2.467, p = .053$.

Table 14

One-Way ANOVA: Barriers Foreseen in Integrating Video Games Across the Pre-service Programs

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>$df$</th>
<th>Mean Square</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>1.391</td>
<td>4</td>
<td>.348</td>
<td>2.467</td>
</tr>
<tr>
<td>Within Groups</td>
<td>9.163</td>
<td>65</td>
<td>.141</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10.554</td>
<td>69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: n’s range from 69-74 due to missing data.

If Provided Opportunities, Would Pre-service Teachers Integrate Video Games in the Learning Environment?

To answer the research question of whether or not pre-service teachers would implement video games if they are provided opportunities to do so, 9 survey items grouped in Section 4 were analyzed.

The chi-square test (see Table 15) and the t-test (see Table 16) results reported below indicate that: (i) While pre-service teachers differ significantly in their willingness to integrate video games in their learning environment, (ii) On an average, they would be willing to integrate video games in their learning environment if provided opportunities to do so, $t(69) = -22.16, p < 0.01$. 
Table 15

*Pre-service Teachers’ Responses on the Integration of Video Games*

<table>
<thead>
<tr>
<th>Items</th>
<th>Section 4</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>n</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>8</td>
<td>19</td>
<td>26</td>
<td>11</td>
<td>5</td>
<td>69</td>
<td>21.36**</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>10</td>
<td>25</td>
<td>22</td>
<td>9</td>
<td>3</td>
<td>69</td>
<td>25.13**</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>10</td>
<td>23</td>
<td>18</td>
<td>11</td>
<td>6</td>
<td>68</td>
<td>13.61**</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>10</td>
<td>32</td>
<td>12</td>
<td>11</td>
<td>4</td>
<td>69</td>
<td>32.82**</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>9</td>
<td>19</td>
<td>20</td>
<td>15</td>
<td>7</td>
<td>70</td>
<td>9.71**</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>0</td>
<td>19</td>
<td>21</td>
<td>28</td>
<td>2</td>
<td>70</td>
<td>43.57**</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>1</td>
<td>14</td>
<td>21</td>
<td>31</td>
<td>3</td>
<td>70</td>
<td>44.85**</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>5</td>
<td>34</td>
<td>15</td>
<td>11</td>
<td>2</td>
<td>67</td>
<td>47.25**</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>10</td>
<td>21</td>
<td>23</td>
<td>8</td>
<td>6</td>
<td>68</td>
<td>18.02**</td>
<td></td>
</tr>
</tbody>
</table>

Note: n’s range from 67-70 due to occasional missing data. $\chi^2 = \text{Chi Square}, \text{Critical } \chi^2 \text{ for 4 degrees of freedom } = 13.28, **p < .01$

Table 16

*t-test for Average Willingness to Integrate Video Games*

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>SE</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 4</td>
<td>70</td>
<td>2.69</td>
<td>.682</td>
<td>.081</td>
<td>-22.16</td>
<td>69</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note: Scale: 1= Strongly Agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Strongly Disagree

Test Value = 4.5

Table 17 indicates the results for the one-way analysis of variance test. Based on the test results, we conclude that there is no significant difference between the pre-service
education programs in pre-service teachers’ willingness to integrate video games, $F (4, 65) = 1.45, p = .228$.

Table 17

_One-Way ANOVA: Integration of Video Games between the Pre-service Programs_

<table>
<thead>
<tr>
<th>Pre-service programs</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>2.634</td>
<td>4</td>
<td>.658</td>
<td>1.450</td>
</tr>
<tr>
<td>Within Groups</td>
<td>29.521</td>
<td>65</td>
<td>.454</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>32.155</td>
<td>69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: n’s range from 67-70 due to occasional missing data.*

Further analysis was conducted to find out the frequency of age and gender (see Tables 18 and 19) influences on barriers. A cross-tabulation of responses to Section 3 items with age reveals that the majority (61.4%) of pre-service teachers who believe that there are barriers in integrating video games in the classroom fall in the 20-25 age groups.
Table 18

*Section 3 Frequencies with Age*

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 20 years</td>
<td>8</td>
<td>11.4</td>
</tr>
<tr>
<td>20 - 25 years old</td>
<td>43</td>
<td>61.4</td>
</tr>
<tr>
<td>25 - 30 years old</td>
<td>9</td>
<td>12.8</td>
</tr>
<tr>
<td>30 - 35 years old</td>
<td>4</td>
<td>5.7</td>
</tr>
<tr>
<td>More than 35 years</td>
<td>6</td>
<td>8.5</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>7.1</td>
</tr>
</tbody>
</table>

*Note: n = 75*

Most of the pre-service teachers who believe that there are barriers in integrating video games are female (70%) when compared to male pre-service teachers (30%).

Table 19

*Section 3 Frequencies with Gender*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>21</td>
<td>30.0</td>
</tr>
<tr>
<td>Female</td>
<td>49</td>
<td>70.0</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>7.1</td>
</tr>
</tbody>
</table>

*Note: n = 75*
CHAPTER 5

Summary, Conclusion and Implications

The first section of this chapter consists of a summary of the study. In this section, an overview of the methodology and methods are discussed. The next section contains the discussion of the findings and conclusions based on the statistical analysis of data. The final section contains the implications of the study as well as the limitations and recommendations for future research.

Summary of the Study

This study is an attempt to study the perceptions, beliefs and willingness of pre-service teachers on using video games as one of their teaching tools in their classrooms.

The study utilized survey methodology to specifically examine the perceptions and beliefs of pre-service teachers using video games as one of their teaching tools. The guiding questions were:

1. What experiences do pre-service teachers have with video games?
2. Do pre-service teachers believe that the use of video games will enhance learning?
3. What barriers, if any, do pre-service teachers foresee in the integration of video games?
4. If provided opportunities, would pre-service teachers integrate video games in the learning environment?

The descriptive analyses of the obtained data along with the inferential analyses of pre-service teachers’ responses offered answers to the four research questions posed by
the researcher earlier in this study. The study also analyzed whether the different age groups differ in their personal experiences and beliefs.

The results were analyzed using mean scores, frequencies, standard deviations, and standard error to examine the perceptions and beliefs that pre-service teachers have towards using video games as their teaching tools. More statistical analyses were done to find out if there was any significant difference with the age, gender and between the pre-service teachers’ programs.

This study found that pre-service teachers in all programs have prior experience in playing video games. Most of the pre-service teachers reported that they have positive experiences and fun in playing video games. Pre-service teachers believe that they need administrative and technical support in implementing video games in their classroom. Pre-service teachers in all programs universally responded that they need help in choosing the right video game for their classrooms. This may be due to the large number of video games introduced in the recent years.

**Findings and Discussion**

Conducting this research provided an opportunity to understand the beliefs of pre-service teachers in using video games as one of their teaching tools. The study revealed that pre-service teachers in all programs have had positive experiences in playing video games. Pre-service teachers reported that they did not take any video game classes previously in their program or from any educational institution. They play video games to relieve tension or stress. Interestingly, most of the pre-service teachers (56.2%) have access to play video games using Play Stations, Wii and Xbox, which are expensive and popular. It is reported in Education Database Online (2011) that 65% of United States
VIDEO GAMES AS TEACHING TOOLS

(U.S.) households spend approximately 18 hours a week playing video games using primary consoles such as Play Stations, Wii and Xbox. In general, pre-service teachers who reported having fun playing video games also reported that they had positive experiences. Pre-service teachers who have enjoyed playing video games are more likely to implement video games in the classrooms. Also, they reported that they play video games to ease their stress in the workplace. However, they do not prefer their friends and family members playing video games. This may be due to the fact that video games are not treated as educational video games; rather it might have been observed as violent and time consuming as per earlier literature. Video games once considered as violent can also be considered as an educational tool.

Pre-service teachers believe that video games in the classroom enhance students’ learning and engage them to pay more attention in the classroom. Out of 69 pre-service teachers, 32 agree that they can expand their teaching skills by using video games in their classroom. Also, they have reported that it is important to integrate video games in the classroom. Gee (2001) argues that good video games use the same instructional and learning processes that schooling does. Constructivism suggests that learners come up with ideas when they are actively engaged in making some type of external artifact, which they can reflect upon and share with others.

Video games are identified as one of the best tools for teaching, for getting students engaged, and enhancing learning in the classroom. Video games can conceptualize stories, environmental elements, characters and connect them with the real life situations that students experience (Clark & Ernst, 2009). Children don’t get ideas; they make ideas. With the increasing number of educational video games, the use of
video games has prompted considerable attention in schools as a powerful tool in classrooms for enhancing learning. Video games make learning ‘fun’. They engage students and make them pay more attention in the classroom. Engagement and motivation have long been established as better outcomes of using games in the classroom (Joyce, Gehard & Debry, 2009). A decade ago, Selfe and Hawisher (2004) reported that teachers have limited experience with online role playing games. But this is not true with this study when we asked pre-service teachers about their video game experience. Most of the pre-service teachers have access to video game consoles and they showed their willingness to integrate video games in their classrooms.

Pre-service teachers also reported that video games are time consuming but they believe that it would not affect their workload. The results are encouraging in that pre-service teachers are comfortable using video and integrating video games as a teaching tool. If pre-service teachers are provided opportunities, it will expand their awareness of the instructional merit of video games and understand the context of learning using video games.

While video game based learning has shown positive results among pre-service teachers, school administration plays a major role in implementing video games in the curriculum. Schools should encourage and experiment with video game enhanced syllabi. Most of the pre-service teachers did not feel that video games would increase their workload though they felt that it is time consuming and they need support. Another important finding of the study was support from the younger pre-service teachers between the ages of 20 to 25. This is a proof that the current generation of pre-service teachers has more
interest in experimenting with different techniques in teaching. They feel that students will pay more attention.

However, with all the positive beliefs and experiences of pre-service teachers with the use and integration of video games in the classrooms, they do foresee some barriers such as technical support, choosing the appropriate video games, and financial assistance. They were not sure what video games are apt for their students. In addition, pre-service teachers are concerned about proper training and financial assistance.

The first step towards understanding how video games transform education is changing the widely shared perspective that games are “mere” entertainment. Understanding how games can provide powerful learning environments might go a long way toward the shifting of the current anti-gaming language. The past century has seen an increasing identification of learning with schooling. But new information technologies challenge this union in fundamental ways. Today’s technologies make the world’s libraries accessible to anyone with the wireless Personal Digital Assistant (PDA). A vast social network is literally at the fingertips of anyone with the cell phone. As a result people have created their own learning environments and opportunities. But classrooms have not adapted. Theories of learning and instruction embodied in school systems designed to teach a large number of students a standardized curriculum are old fashioned in this new world. Good teachers and good school leaders fight for new technologies and new practices. Students will learn from video games. The interest in games is encouraging, but most educational games to date have been produced in the absence of any coherent theory of learning or underlying body of research. The important question here is how comfortable are teachers about this relatively new medium? Video games
have the potential to change the landscape of education if they are appropriately used and implemented.

**Implications for Future Research**

Video games are identified as one of the best tools for teaching and getting students engaged and learning in the classroom. Video games can conceptualize stories, environmental elements and characters and connect them with the real life that students experience in their daily life (Clark & Ernst, 2009). This study reported that pre-service teachers have prior experience in playing video games and they believe that using video games in their teaching would enhance their teaching ability. However, it is important to find that the school administration also believe the same. Future research could be conducted on the beliefs of teachers and administrators. The pre-service teachers also reported that they need help in choosing the appropriate video games for their classroom. This is an important concern and should be properly addressed. This suggests a future study to understand students’ preferences on the type of video games.

With computer-aided learning programs, teachers may assist students on social aspects such as critical learning, knowledge based communication and effective interpersonal skills that traditional methods of teaching cannot offer. The medium of educational games provides an opportunity for teachers to introduce educational and playful elements into the learning environment. Pre-service teachers reported that video games enhance effective teaching. However, it is important to know how it differs from traditional teaching. A comparative study on the learning outcomes of schools that use video games and schools that do not use video games is recommended for future research.
VIDEO GAMES AS TEACHING TOOLS

Most of the pre-service teachers responded that they need support from the school administration both technically and financially in implementing video games. This leads to the need for further studies with school administrators and their concerns on video game enhanced curriculum. This particular study was conducted with pre-service teachers enrolled for the year 2010-2011. The researcher recommends that a similar study of pre-service teachers in more than one institution be undertaken that would provide a more generalized understanding of teachers’ perceptions and beliefs.

Conclusion

It is hard to predict future trends in video gaming technology. Video games are diverse, engaging, attractive and complex and that is what the current generation of students expects. With the availability of technology, students get easily bored with information repeated more than once. Video games are one of the promising technology tools that can keep these students to understand concepts better. The challenge is now to find the adequate games to keep them engaged. There should be an awareness created for the school administrator regarding how such technology would enhance learning and make schools a better place.

Teachers believe teaching has a strong impact on the way teaching and learning takes place in the classrooms. This situation has not helped in any way when beliefs about teaching are considered in the use of technology. Many studies have been conducted to identify factors that determine teachers’ willingness to accept or adopt technology in education. However, a majority of the studies focused on whether or not teachers use technology in their teaching practices.
VIDEO GAMES AS TEACHING TOOLS

In conclusion, it is hoped that this study will contribute a better understanding of what pre-service teachers believe in integrating video games as one of their teaching tools. The current generation of pre-service teachers has experience in playing video games and they hope that video games will help their students to learn better. Pre-service teachers believe that school administrators would allow them to integrate such technology in their classroom. However, they expect technical and financial assistance in choosing the appropriate video games and with the installation. Integration of video games as a teaching tool will provide a motivation to pre-service teachers to engage in adapting new technology into their teaching methods.
References


Association for Supervision and Curriculum Development, Alexandria, VA 22311.


VIDEO GAMES AS TEACHING TOOLS


   Educational Technology, 43 (5), 17-23.


   Journal of Pragmatics.


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Appendix A

Recruitment Letter
Dear Participants:

My name is Joy Bensiger. I am a full time graduate student in C&I. My specialization is Education, Knowledge and Technology.

My research focuses on Perspective of pre-service teachers in using video game as one of their teaching tools. This study is a part of my doctoral requirement. Participating in the study is completely optional. However, I invite you all to participate in the study. As additional confirmation, I have my Information Sheet attached in the beginning of the survey instrument. Please Click on the link below to participate in the study.


Thank you for your help.

Respectfully,

Joy Bensiger


Doctoral Student, Curriculum and Instruction, CECH
Appendix B

Second Reminder Letter
Joy Bensiger

Doctoral Student,

College of Education, University of Cincinnati, Cincinnati, OH 45221

Dear Participants:

My name is Joy Bensiger. I am a full time graduate student in C&I. My specialization is Education, Knowledge and Technology. If you haven't participated in the study, please consider this as the final reminder.

My research focuses on Perspective of pre-service teachers in using video game as one of their teaching tools. This study is a part of my doctoral requirement. Participating in the study is completely optional. However, I invite you all to participate in the study. As additional confirmation, I have my Information Sheet attached in the beginning of the survey instrument. Please Click on the link below to participate in the study.


Thank you for your help.

Respectfully,

Joy Bensiger


Doctoral Student, Curriculum and Instruction, CECH
Appendix C

Information Sheet
Information Sheet for Research

University of Cincinnati

Department: CECH, Teachers College, University of Cincinnati

Principal Investigator: Joy K. Bensiger, Ph: 513-519-5019 email:
bensiger@gmail.com

Faculty Advisor: Piyush Swami Ph.D. Ph: 513-556-3567 email:
piyush.swami@uc.edu

Title of Study: Perception of pre-service teachers in using video games as teaching tools

Introduction:

You are being asked to take part in a doctoral research study. At the end of this document you may find a link that takes you directly to the survey questions. Please read this information carefully before you proceed with the questionnaire.

Who is doing this research study?

The person in charge of this research study is Joy K. Bensiger, doctoral student in Educational Knowledge and Technology of the University of Cincinnati (UC) Department of CECH, Teachers College.

What is the purpose of this research study?

The purpose of this research study is to investigate the perception of pre-service teachers in implementing video games in their classroom and also find out what are the barriers
VIDEO GAMES AS TEACHING TOOLS

that involved in implementing video games.

Who will be in this research study?
About 150 people will take part in this study. You may be in this study if you are currently enrolled in the pre-service program at the Teachers College, University of Cincinnati.

What will you be asked to do in this research study, and how long will it take?
You will be asked to click on the link at the end of this document, which would take you directly to the questionnaire. It will take about 10 – 15 minutes. Prior to accessing the questionnaire, there will be an option for you to choose whether you want to participate or NOT to participate in the study.

Are there any risks to being in this research study?
It is not expected that you will be exposed to any risk by being in this research study.

Are there any benefits from being in this research study?
You will probably not get any benefit from taking part in this study. But, being in this study may help you to understand the role of pre-service teachers in using video game as teaching tools.

Will you have to pay anything to be in this research study?
VIDEO GAMES AS TEACHING TOOLS

You will not have to pay anything to take part in this study.

What will you get because of being in this research study?
You will not be paid (or given anything) to take part in this study.

Do you have choices about taking part in this research study?
If you do not want to take part in this research study, after you click on the survey link, you may have an option to exit out of the survey.

How will your research information be kept confidential?
Your information will be kept confidential by keeping the research data on a password protected computer for three months after completing the study. After three months it will be deleted by Joy Bensiger, the principal investigator.

Agents of the University of Cincinnati may inspect study records for audit or quality assurance purposes.

What are your legal rights in this research study?
Nothing in this consent form waives any legal rights you may have. This consent form also does not release the investigator, the institution, or its agents from liability for negligence.

What if you have questions about this research study?
VIDEO GAMES AS TEACHING TOOLS

If you have any questions or concerns about this research study, you should contact Joy Bensiger at 513-519-5019 or, you may contact the PI’s faculty advisor, Dr. Piyush Swami at 513-556-3567

The UC Institutional Review Board reviews all research projects that involve human participants to be sure the rights and welfare of participants are protected.

If you have questions about your rights as a participant or complaints about the study, you may contact the Chairperson of the UC IRB at (513) 558-2086. Or, you may call the UC Research Compliance Hotline at (800) 889-1547, or write to the IRB, 300 University Hall, ML 0567, 51 Goodman Drive, Cincinnati, OH 45221-0567, or email the IRB office at irb@ucmail.uc.edu.

Do you HAVE to take part in this research study?

No one has to be in this research study. Refusing to take part will NOT cause any penalty or loss of benefits that you would otherwise have. You may start and then change your mind and stop at any time. To exit out of the survey, at any point of time during the survey, you may close down the browser.

BY TURNING IN YOUR COMPLETED SURVEY YOU INDICATE YOUR CONSENT FOR YOUR ANSWERS TO BE USED IN THIS RESEARCH STUDY.

PLEASE PRINT A COPY OF THIS INFORMATION SHEET FOR YOUR REFERENCE.
Appendix D

Survey Instrument
VIDEO GAMES AS TEACHING TOOLS

Perceptions of Pre-service Teachers in Using Video Games as One of Their Teaching Tools

For this survey, video game is defined as “educational games either using Computers, Wii, PS3, any mobile devices or virtual environment such as Second Life, peer to peer online gaming”. This survey is designed to determine the perception of pre-service teachers in using video game enhanced curriculum in their classrooms. By completing this survey, you give permission to use your response for the study. The data collected from this survey would be kept confidential. The data will be destroyed after the completion of the study. If you have any questions about the survey or any other aspect, please me at: bensigjk@email.uc.edu, phone: 513 519 5019. or my advisor Dr. Piyush.Swami at piyush.swami@uc.edu, phone: 513 556 3567.

Thank you

Joy Bensiger.
Please read each statement and then select the appropriate answers by clicking the buttons located on the right-hand side of each question.

SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD= Strongly Disagree

### I. Personal Experience about video games:

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<tr>
<th></th>
<th>SA</th>
<th>A</th>
<th>N</th>
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<tr>
<td>1. I play video game on daily basis.</td>
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<td>2. I prefer playing video games for fun</td>
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<td>3. I prefer playing video games for learning new concepts</td>
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<td>4. I have a positive experience in playing video games?</td>
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<td>5. I have a negative experience in playing video game?</td>
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<td>6. My friends play video games almost every day.</td>
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<td>7. I prefer my friends play video games</td>
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<tr>
<td>8. My family plays video games almost every day</td>
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<td>9. I prefer my family to play video games.</td>
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<td>10. I have taken several classes on video games</td>
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### II. Video game experience at work:

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<tr>
<td>11. I play video games whenever I am free at work.</td>
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<td>12. At work I play video games using computers or mobile devices?</td>
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<td>13. As an educator I believe video games would help my students to develop their social skills.</td>
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<td>14. As an educator I believe video games would help my students to develop their academic skills.</td>
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<td>15. My colleagues have always something to say about video games.</td>
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<td>16. Most of my colleagues play video games.</td>
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<td>17. My supervisor believes the use of video games in the classrooms.</td>
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<tr>
<td>18. The working environment supports the idea of playing video games.</td>
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</table>

### III. Personal belief in implementing video games:

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<th>SD</th>
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<tr>
<td>19. Integrating video games in the classroom is important.</td>
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<tr>
<td>20. I believe the use of video games in the classroom will increase the students’ engagement.</td>
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<td>21. I value the use of video games in teaching.</td>
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### IV. Barriers in integrating video game:

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<tr>
<td>29.</td>
<td>Video games enhanced classroom needs more technical support</td>
<td>(Use on daily basis)</td>
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<td>30.</td>
<td>My organization allows me to install software applications based on my classroom needs.</td>
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<tr>
<td>31.</td>
<td>It is hard to get video games installed in my classroom computers.</td>
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<tr>
<td>32.</td>
<td>My school allows me to get adequate training opportunities to learn new technology that could be used in the classroom.</td>
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<tr>
<td>33.</td>
<td>It is too hard to identify the right video game for the students.</td>
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<tr>
<td>34.</td>
<td>Integrating video games would increase my workload.</td>
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<tr>
<td>35.</td>
<td>Video game is time consuming.</td>
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<tr>
<td>36.</td>
<td>If I use a video game, I may not be able to cover the given syllabus.</td>
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<tr>
<td>37.</td>
<td>I am comfortable in discussing with my supervisor about integrating video games in the classroom.</td>
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<tr>
<td>38.</td>
<td>More financial assistance from the state government is needed to implement video games in the classroom.</td>
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### Video Games as Teaching Tools

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<tr>
<td>42.</td>
<td>How Many years have you lived in the US?</td>
<td>1&lt;</td>
<td>1-3</td>
<td>4-6</td>
<td>7-10</td>
</tr>
<tr>
<td>43</td>
<td>Do you have a disability?</td>
<td>Yes</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>44</td>
<td>Gender</td>
<td>Male</td>
<td></td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>What is your age?</td>
<td>&lt;20</td>
<td>20=25</td>
<td>25-30</td>
<td>30-35</td>
</tr>
<tr>
<td>46</td>
<td>What device do you mostly use for playing video games?</td>
<td>Computers Off-line</td>
<td>Computers on-line</td>
<td>PlayStations WII X-Box</td>
<td>Others</td>
</tr>
<tr>
<td>47</td>
<td>Does your major relate with video games?</td>
<td>Yes</td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Have you ever developed or designed video games?</td>
<td>Yes</td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Does your education experience help you to design video games?</td>
<td>Yes</td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Where did you learn how to play video games?</td>
<td>Family</td>
<td></td>
<td>Friends</td>
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</tbody>
</table>