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Six fifth grade students experiences participating in active gaming during physical education classes

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Six Fifth Grade Students Experiences Participating in Active Gaming during Physical Eduction Classes

by

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Dedication

I dedicate my dissertation work to my family. First, a special feeling of gratitude to my loving parents and sister, Dennis and Betty Witherspoon and Amy Robinson, whose on-going support and words of encouragement have truly assisted me not only through this journey, but through life itself. I love you so much; this work could never quantify the appreciation and gratitude I feel.

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I dedicate this work with passion and faith to our Lord and Savior. Without his love and support, nothing accomplished would have been possible.

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Abstract

As technology and sedentary lifestyles have become an integral part of children's lives, so too has the prevalence of childhood obesity. Although video games are often associated with influencing sedentary behaviors, active gaming is a new genre that requires children to become physically active while playing the games. In this inquiry I explored six fifth grade students' experiences participating in active gaming in physical education classes for 30 minutes, twice weekly, during an eight week (16 sessions) study. I used qualitative methods including interviews, journal entries, and observational field notes. Analysis of data revealed students have a "Persistence to Game" (P^2G) when participating in active gaming during physical education. When students experience P^2G I considered them to be at "play" demonstrating play-like attributes. Persistence to game includes eight elements. Although not all elements need to be present at the same time, when these elements interact, students experience flow. The discoveries of this study suggest active gaming can be an appropriate tool used in 21st century physical education classes that appeals and is desirable to students.

Chapter 1

Introduction

Technology has undeniably become an integral part of society (Lindstrom, & Seybold, 2003). The television has taken second place to other fascinating electronic devices such as computers, cell phones, iPods, and video games. Children now grow up in a culture that functions around the utilization of appealing and motivating technology driven gadgets; many of which are screen-based activities. The amount of time children engage in screen-based activities is astonishing. Children between the ages of 8 to 18 spend more than 44.5 hours per week in front of a computer, television, or game screen (Kaiser Foundation, 2005) and 49 minutes per day are spent playing video games alone (Roberts, Foehr, & Rideout, 2005). Children suggest these screen- driven activities are fun, which is significant given that 86.2% of adolescents consider having fun as the single most important element in their lives (Lindstrom, & Seybold, 2003).

One popular screen-based activity that children appear to enjoy is the video game. Eighty-three percent of American children between the ages of 8 – 18 have one or more video game consoles, such as Sony Playstation, Microsoft Xbox, and Nintendo GameCube (Roberts, Foehr, & Rideout, 2005). Eighty-six percent of children also have access to computers at home and 91% of those play video games on their computers (Chapman & DeBell, 2003). The amount of the time children spent playing videogames

nearly doubled from 1991 to 2003 from 29 to 49 minutes per day (Foehr, Rideout, & Roberts, 2005). Because of the amount of time this generation spends playing video games, it is often referred to as the "Gamer Generation", including over 90 million children (Beck & Wade, 2004). Furthermore, as technology graphics continue to improve, video games will likely remain a desired part of the Gamer generation's lives (Lindstrom, & Seybold, 2003).

Physical Activity and Obesity

The amount of time this generation spends playing sedentary screen-based activities leaves little time to engage in other activities, including the recommended amount of daily physical activity. This lack of physical activity contributes to a serious condition, childhood obesity. During the past several decades, childhood obesity has risen greatly worldwide. Over the past 30 years, the prevalence of overweight children ages six -11 increased from 6.5% to 18.8% and in children ages 12-19 from 5.0% to 17.4% (CDC, 2008). Additionally, one in three children is considered overweight or obese (CDC, 2008). Obesity in childhood causes a wide range of serious complications and is strongly associated with co morbid conditions such as cardiovascular disease, type 2 diabetes mellitus, coronary artery disease, hypertension, stroke, and heart failure (Daniels, 2006; Weiss & Caprio, 2005), Obesity also increases the risk of premature illness and death later in life (Ebbeling , Pawlak , & Ludwig, 2002). According to the CDC (2008), obesity is the number one health threat in the United States and the second preventable cause of death next to smoking. Unfortunately, the number of children who face overweight and obesity today continues to escalate with no apparent indication of it ending (CDC, 2004).

The rise of overweight and obesity in children parallels the rise in the lack of engagement in physical activity (CDC, 2004). Not only is it known that physical activity levels decline throughout the lifespan (Caspersen, & Meritt, 1995), but research indicates that a decrease in physical activity levels occurs greatest during adolescent years (Caspersen, Pereira, & Curran, 2000; Van Mechelen, Twisk, Post, Snel, & Kemper, 2000). National organizations suggest that children obtain *at least* 60 minutes of moderate to vigorous physical activity on almost every day of the week (NASPE, 2006; CDC, 2008). Some children, such as those with risk for overweight, may need more than 60 minutes per day in order to maintain or regain adequate health status. Many children do not acquire even the minimum amount of physical activity recommenced and needed on a daily basis (NASPE, 2006).

Physical Education and Physical Activity

Lack of physical activity in children is a result of various factors; one of which may result from unfavorable experiences in the physical education classroom (Dyson 1995). Although children generally enjoy physical education class (Dyson, 1995), physical education classes are difficult places for children who are not physically skillful and fit (Suomi, Collier, & Brown, 2003). It is inarguable that individual differences in motor ability exert a significant influence on children's decisions to engage in activities in physical education classes (Solomon & Lee, 2008). Children who have difficulty executing tasks are at risk for lower perceptions of competence if they struggle to succeed when others can perform motor skills easily leading to negative experiences in physical education (Solomon & Lee, 2008). When children have negative experiences in physical education classes they are more likely to avoid engaging in physical activities, which can

have negative consequences for their long-term health, and they may be at risk for low self-esteem because of low perceptions of competence in physical activities (Solomon & Lee, 2008). Based on National Standards, physical education teachers should create an environment that is individualized to meet the needs of all children in order for physical activity experiences to be enjoyable (NASPE, 2006). After all, enjoyment is one of the most important characteristics of quality physical education programs (Wechsler, McKenna, Lee, & Dietz, 2004).

The vision of NASPE, which reflects the goal of physical education curriculum is to guide children in becoming healthy and physically active for a lifetime (NASPE, 2008). Regrettably, research shows that children become less physically active as they progress in age (Sallis, Alcaraz, McKenzie, & Hovell, 1991; Telama & Yang, 2000) indicating that physical education programs do not accomplish this important goal. Research suggests that experiences in physical education that meet children's need for fun and accomplishment will encourage future participation in physical activity (Robertson-Wilson, Baker, Derbinshyre, & Cote, 2003; Weiss, 2000).

Physical Activity and Video Games

Finding ways to motivate children to be physically active can be difficult task with this generation, yet one of great importance. According to research children choose to spend more time playing video games instead of engaging in traditional physical activities. However, in this era largely influenced by technology, a new movement has emerged that involves video game play and physical activity. This contemporary phenomenon is called active gaming and is growing in popularity (Bogost, 2007). Active games are technology driven activities that are "screen-based" and require participants to

engage in physical movement in order to play the games (Hansen & Sanders, 2008). This innovative genre of video games allows children to participate in the activities while being physically active. A noteworthy aspect of active gaming is that children do not believe they are exercising; they are simply *playing* video games (Hansen & Sanders, 2008).

It is recognized that experiences in physical education, which meet children's needs for fun and accomplishment within a social context will encourage future participation (Robertson-Wilson, Baker, Derbinshyre, & Cote, 2003; Weiss, 2000;). Research explains that this generation of children desires to engage in video games (Beck & Wade, 2004; Chapman & DeBell, 2003; Roberts, Foehr, & Rideout, 2005) Therefore, it is important to explore how children perceive physical activity and video game play while participating in active gaming. Active gaming is a relatively new field and more research is needed to understand the potential benefits active gaming activities may have on children. Yet, it is also important to understand how children feel about active gaming during physical education. In addition, there is value in learning how the physical education teacher's perceptions assist in clarifying the students' experiences with active gaming in physical education class.

Purpose Statement

The purpose of my research was to explore the experiences of six fifth grade children as they participated in active gaming during physical education classes. In my inquiry I also explored the experiences of three boys and three girls as they participated in active gaming.

Research Questions

Little research regarding active gaming in physical education exists. Learning how children perceive this new phenomenon is important to better understand this popular physical activity. In order to facilitate an investigation of fifth grade children, the following research questions guided my study:

1. What are the experiences of six fifth grade students as they participated in an eight week active gaming unit in physical education class?

2. What are the experiences of three fifth grade boys and three fifth grade girls as they participated in an eight week active gaming unit in physical education class?

Significance of the Study

This study is significant for many reasons. First there is a need to learn more about active gaming in and outside of the physical education classroom. This modern day movement is largely under researched that allows for limited information in the current literature regarding active gaming. It is important to understand if children enjoy and desire active gaming as a part of their physical education class. This is significant because research suggests when children enjoy activities in physical education they are more likely to want to participate and learn new motor skills (Weiss, 2000; Robertson-Wilson, Baker, Derbinshyre, & Cote, 2003). In addition, although organizations suggest that children engage in at least 60 minutes of moderate to vigorous activity almost every day of the week, many children do not meet this goal. It is important to learn if

participating in active gaming may help motivate children to become more physically active in and outside of school. Furthermore, investigating fifth grade children's experiences while participating in active gaming will contribute to curriculum development for future practice in the physical education field. Due to the universally scarce research on active gaming, information on children's perceptions will contribute not only to the physical education field but also the innovative field of active gaming. The results from this study may be used to guide future research.

Delimitations

In this study, I used case methods. In research, delimitations address how the study is narrowed in scope (Creswell, 1998), and case studies are by nature limited in scope (Yin, 2003). As a result, this study is limited to respondents who participate in the case study.

I purposely limited this study to six fifth grade students and include the physical education teacher. I limited participation because of the nature of the data collected for this case study and the time required to analyze qualitative data. I selected an ample number of participants in order to secure appropriate triangulation and a sufficient inundation of data to secure the credibility of the information fabricated. Additionally, if participants chose to withdraw from the study the investigation could have proceeded as a case study as the participants remaining would have been sufficient (Yin, 2003).

Limitations

Limitations in research are meant to identify potential weaknesses of a study (Creswell, 1998). One main limitation in case studies is that generalizations cannot be

made to larger populations (Yin, 2003). I considered this restriction throughout the study (Locke, Spirduso, & Silverman, 2000). The following potential limitations are specific to this case study:

1. The fifth grade students discussed in this study cannot be representative of the total population of fifth grade students.

2. Students were videotaped and observed only during eight weeks of participating in active gaming. Their experiences and interpretations of their experiences may not be representative of experiences encountered during the entire school year or in active gaming facilities outside of physical education.

3. The experiences learned from the participation in the selected active gaming activities may not be representative to all active gaming activities or settings.

4. The physical education teacher is not experienced in implementing active gaming in physical education class. Although I am experienced in active gaming and will train and provide the physical educator with the lesson plans, this eight week study was the first experience she had implementing active gaming in a physical education class. Therefore, the students' experiences cannot be representative for all fifth grade students.

Definition of Terms

Active Gaming – Technology driven activities that are "screen-based" and require participants to engage in physical movement in order to play the games.

Dance Dance Revolution (DDR)– A dance pad that requires a player to move his or her feet to a set pattern that matches the general rhythm or beat of a song. Children stand on a "dance pad" in front of a monitor or television screen and step, stomp, or hop in the direction (i.e., up, back, right, and left) of the arrows that scroll up the screen to the rhythm of the music. DDR improves cardiovascular endurance and muscular endurance in the leg muscles.

Exergaming – A term interchangeable with active gaming referring to technology driven activities that are "screen-based" and require participants to engage in physical movement in order to play the games.

Gamercize - Gamercize - A fitness machine with an interface to a video games console. When in motion the fitness machine provides a signal to the interface module. The interface allows interaction between the game controller and games console only when the signal is present. Gamercize therefore requires the player to remain in motion in order to play the game. Gamercize improves cardiovascular endurance, balance, and coordination.

Game Cycle – An upper body ergometer bike that requires children to control onscreen actions by pedaling and steering the bike with their arms instead of the legs. The Game Cycle improves muscular strength and endurance in the arm muscles and also improves cardiovascular endurance.

Gamer generation – The term used to identify the current generation of children that are passionate about playing video games and spend more time playing video games then on other activities.

Interactive Fitness – Non screen-based technology driven activities that require participants to use their bodies to play the game. An example of an interactive fitness activity is 3 Kick.

Non screen-based – Technology driven activities that do not require a television screen or other monitor in order to play the game. All interactive fitness activities are non screen-based.

Screen-based – Technology driven activities that require the use of a television screen or computer monitor in order for participants to play the game. All active gaming activities are screen- based.

Virtual Bikes -- Virtual bikes resembling traditional bikes that allow children to control all on-screen actions, including steering, speed, turns, firing mechanisms and other strategies. The faster the player pedals, the faster the objects on the screen moves. The children also control the movement of the objects on the screen using the steering wheel. Virtual bikes improve muscular strength and endurance in leg muscles and also improve cardiovascular endurance. Examples of virtual bikes include the Cateye GameBike, the Expresso Bike, and the Dog Fighter Bike.

Virtual Sports - Virtual sports allow children to play tennis, go bowling, practice boxing, or participate in a baseball game inside of a virtual world on a screen. Children may actually hold an implement that simulates a bat, racquet, or paddle as well as wear a pair of boxing gloves during game play. Virtual sporting games are capable of providing children with a variety of health benefits—including cardiovascular endurance, muscular

endurance, balance, and flexibility—depending on the sport chosen. The Xavix console and Nintendo Wii are examples of virtual sport exergames.

XrBoard – A balance board simulator that allows children to experience the thrill of snowboarding down a mountain or practicing complicated skateboarding tricks. The XrBoard improves balance and coordination, muscular strength and endurance in leg muscles, as well as ankle flexibility and stability.

3 Kick – A martial arts simulator designed with resilient foam pads that can be punched, kicked, slapped, or tapped with shoes or bare feet, a fist, or an open palm. A light comes on in the pad and an audible tone sounds, when the pad is hit the light goes off and randomly another comes on. The score is based on speed as more points are allocated the faster children are able to get to a light. 3 Kick develops cardiovascular strength and endurance, muscular strength and endurance, and flexibility.

The Researcher

Patton, 2002 suggests it is important for researchers to understand who they are in order to understand how they can influence and learn from experiences during fieldwork and data analysis. In this section, I explain how my background and professional experiences relate to the research in this inquiry. I grew up in a small, southern town with my parents and one sibling, a sister. My parents worked very hard to provide a good lifestyle for both my sister and me, and they have always provided us strong support. Being physically active has always been a passion of mine. Growing up I was involved in many traditional sports and outdoor activities. Although I had access to video games, the majority of my recreational time was spent playing games with the neighborhood kids in

the backyard. Experiencing success playing basketball as a child inspired me to keep practicing and to pursue a college basketball scholarship. I spent many summers on the basketball court practicing or traveling to tournaments instead of at the amusement park or the beach with my friends in order to achieve this goal. In addition, I was an organized and driven student. I strived to be the best in both academics and athletics as possible. As a result, I received a collegiate basketball scholarship to Virginia Tech in Blacksburg, VA.

Initially, I desired to pursue coaching as a profession. After becoming involved in the Physical Education program at Virginia Tech, I realized a second aspiration I had was to work with people, including children and young adults, in the field of physically activity. I received a Bachelor's degree in K-12 Physical Education and taught elementary and middle school physical education and health for four years. Through various experiences teaching, I learned my ultimate goal was to pursue a Ph.D. in the field of Curriculum and Instruction in physical education. Therefore, I went back to school and received my Master's degree in Health Promotion. Following this degree, I assisted in opening the first children's facility based on active gaming activities in New Jersey. Having worked with children of varying ability levels, I realized that my passion to be active and competitive and my natural ability regarding athletics was far from common nor shared by many children; yet, seeing children finding success while participating in active gaming influenced my decision to pursue a Ph.D. with a research focus in active gaming.

In the Department of Physical Education and Exercise Science at the University in which I studied my Ph.D., and at a local elementary school there were

empty classrooms available used to create active gaming research labs. I and another colleague worked with an active gaming company in order to develop both research labs. The active gaming lab on the University campus was developed through equipment donations from various manufactures that worked with the active gaming company we had collaborated with for the project. The active gaming lab at the elementary school was developed after having received federal funding from an earmark. Through the relationship with the active gaming company, I met my husband who also shares a passion for active gaming.

Prior to beginning this research, I conducted three pilot studies involving children in the active gaming lab on the University campus. In addition, I presented at State, National, and International conferences as well as at invitational events including a Congressional Summit on the topic of active gaming. My previous involvement and experience with active gaming helped support Institutional Review Board (IRB) approval to conduct this research. The IRB is a formatted application that researchers must fill out related to how they plan to conduct their study. The main purpose of the IRB is to monitor the ethical intent and procedures used by the researcher in order to provide protection to the participants involved in the study.

Organization of Remaining Chapters

In the remaining chapters, I present significant information regarding my inquiry. Chapter 2 includes a detailed review of existing literature related to the importance of understanding experiences regarding active gaming in physical education class. Also in Chapter 2 you will find information supporting the various reasons for the growth of the active gaming field, and a theoretical framework which will provide a foundation for this

study. Chapter 3 provides a description and explanation of data collection methods and data analysis procedures I used in the study.

Chapter 2

Literature Review

The purpose of my research was to explore the experiences of six fifth grade students as they participated in active gaming during physical education classes. In my inquiry I also explored the experiences of three boys and three girls as they participated in active gaming. A review of literature suggests there are no studies that investigate the experiences students have during physical education while participating in an active gaming environment. In order for me to provide a foundation helpful when designing, conducting, and analyzing this research, the literature review encompassed seven areas. The first section reviews childhood obesity. The second section provides a review on students' lack of engagement in physical activity. The third section reviews the current generation's involvement with technology, specifically video games. The fourth section discusses active gaming including current research involving active gaming. Sections five and six provide information on children's attitudes toward physical education and gender appropriateness of physical activities. Section eight provides a review of several theories enveloping the nature and characteristics of students and active gaming. These theories were helpful when I analyzed the data collected for the study.

Childhood Obesity

One common problem related to lifestyle today is being overweight. Studies show there is a 50% increase in the prevalence of obesity since the 1960's. Childhood obesity

has reached epidemic proportions and its prevalence is increasing (Freedman et al, 1997). Worldwide, approximately 22 million children aged <5 are overweight (Deckelbaum & Williams, 2001). Over the past 30 years, the prevalence of obesity in children ages 6 -11 increased from 6.5% to 18.8% and in children ages 12-19 from 5.0% to 17.4% (CDC, 2008). According to the National Health and Nutrition Examination Survey, recent data suggests that a third of American children and teens – about 25 million kids – are either overweight or close to becoming so, the highest number ever recorded (CDC, 2008). In addition, about two-thirds of adults, about 136 million people, are overweight or obese (CDC, 2008). It has been estimated that 80% of obese adolescents become obese adults (Schonfeld-Warden & Warden, 1997).

Obesity in adolescence predicts a broad range of adverse health effects in adulthood (Dallal et al., 1992). Obesity is considered a major modifiable risk factor for cardiovascular disease and is strongly associated with comorbid conditions such as insulin resistance, type 2 diabetes mellitus, coronary artery disease, hypertension, stroke and heart failure (Eckel & Krauss, 1998). The seriousness of childhood obesity is illustrated by remarkable increases in type 2 diabetes among youths (Daniels et al., 1996). If this trend continues, projections indicate that one-third of children born in the year 2010 will eventually develop type 2 diabetes (Boyle et al, 2003); thus emphasizing the urgency of finding solutions for reducing the current epidemic of youth obesity. Behavioral strategies aimed at decreasing obesity are based on the first law of thermodynamics, which states that the amount of stored energy is equal to the difference between energy intakes and energy expended (Watts et al., 2005). Small imbalances of

energy intake and expenditure, which favor energy storage over a long period of time, are principally responsible for fat deposition.

Although many factors influence overweight and obesity including hereditary tendencies, environmental and behavioral factors, and ageing (Martinez, 2000); dietary factors and physical activity patterns strongly influence the energy balance equation and are modifiable factors. These conditions are largely preventable through sensible lifestyle changes such as finding ways to encourage this generation of children to replace sedentary activities with physical activities. A major report on overweight and obesity published in 1997 recommended that, in order to maintain healthy weight, children need to be involved in physical activity rather than dietary restriction because of fears relating to the adverse effects of inappropriate eating patterns, particularly during adolescence (Grau, Meyer, & Moon, 1999).

It is reported that the increase in fat mass in children and adolescents has occurred in tandem with a decline in reported time for exercise (CDC, 2000). Physical inactivity, or a lack of regular exercise, contributes to a variety of health concerns. Of all United States deaths from major chronic disease, 23% are linked to sedentary lifestyles that now begin at childhood (Bulwar, 2004). Given that non-physically active children are more likely to become non-physically active adults (Powell & Dysinger, 1987) it has been suggested that encouraging the development of physically activity habits in children, and reinforcing these habits in adolescents, helps establish patterns that continue into adulthood (Riddoch, 2000).

Physical Activity

Physical activity levels decline throughout the lifespan (Caspersen, & Meritt, 1995), and a significant decrease in physical activity levels occurs during adolescent years (Caspersen, Pereira, & Curran, 2000; Van Mechelen, Twisk, Post, Snel, & Kemper, 2000). In the National Institute of Child Health and Human Development longitudinal study of Early Child Care and Youth Development, from 1991-2007, 1032 participants (517 boys and 515 girls) ages 9yrs and 15 yrs were monitored 4 to 7 days in order to measure the amount of time the participants spend in moderate to vigorous activity (MVPA). The results demonstrated that starting at 9yrs MVPA was 3 hours per day including weekday and weekends. Weekday MVPA decreased by 38 minutes per year while weekend MVPA decreased by 41 minutes per year. By age 15 adolescents were engaged in MVPA for 49 minutes per weekday and 35 minutes per weekend day (Nader, et al., 2008). In addition, boys spent 18 more minutes per weekday and 13 more minutes per weekend in MVPA than girls (Nader et al., 2008). Recommended guidelines suggest that children obtain *at least* 60 minutes of moderate to vigorous physical activity on almost every day of the week (NASPE, 2004; AHA, 2007); yet, many children are not acquiring even the minimum amount of physical activity needed on a daily basis (NASPE, 2006).

Physical activity is associated with better cognitive performance and helps maintain cognitive function (Weuve, Kang, Manson, Breteler, Ware, and Grodstein, 2004). In addition, a physically active lifestyle can help prevent the development of many chronic diseases including cardiovascular disease and obesity. Therefore, it is important to understand ways to help children incorporate more physical activity in their daily lives.

One way is for children to develop motor skills that serve as the foundation for common forms of physical activity. It is widely believed that fundamental movement skills and habitual physical activity are related in childhood and adolescence (Booth, Okely, & Patterson, 2001; Hannah et al, 2006).There is a significant relationship between fundamental movement skills and self-reported participation in organized physical activity in adolescents (Booth, et al., 2001). It is clear that children with developed motor abilities are more physically active and less likely to be sedentary than children with poorer coordination. Motor skills or alternative movement strategies are essential to a child's development, and they contribute to an active lifestyle during every stage of life (Davis, Crim, & Leppo, 2000). Incorporating the fundamentals of movement into children's daily activities can enhance cognitive and affective skills and build a foundation for an active, healthful lifestyle. However, lacking the necessary movement skills is only one of many reasons children are physically inactive.

A major cause for the decline in physical activity in children is the reduction in physical education in American schools. Between 1991 and 2003, enrollment of high school students in daily physical education classes fell from 41.6% to 28.4%. Even recess has been reduced or eliminated in some elementary schools (Davis et al., 2006). Only one-third of states require physical education for elementary and middle school students according to a new report by NASPE and the American Heart Association (Dotinga, 2006). One reason for the reduction of physical education in schools is the implementation of the No Child Left Behind Act. This act has pushed schools to focus on subjects that are routinely tested and forcing school administrators to think more "seat" time is better for education, leaving little time for physical activity. Unfortunately, 65%

of children ages 9-13yrs. report that they are not physically active outside of school hours (Davis et al., 2006); indicating the importance physical education may play in providing opportunities for children to engage in daily physical activity. The decrease in daily physical activity in schools may be a contributing factor to the increase in weight gain among American children.

The decrease in physical activity in children can also be explained by the growing concern of safety in communities (Ginsburg, et al., 2006). In the past, children spent time after school hours engaging in physical activity through playing in the neighborhood and parks located close to home. Due to the growing safety concerns today, children in these unsafe communities are not allowed to play outside of the home unless they are under close adult supervision and protection; resulting in a reduction in the opportunities to engage in active play (Ginsburg et al., 2006).

Furthermore, as technology continues to develop, children spend more time engaged in sedentary activities such as computer use, video game play, and television viewing. American society is being referred to as a "screen-based" culture due to the amount of time individuals spend with technology involving screens. Unfortunately, the use of screens is considered another reason children lack the necessary daily physical active. These screen-based activities (computers, video games, iPods, and televisions) are associated with sedentary activity and are taking up time traditionally used for physical activity. Children consume approximately 40 hours of media each week, mostly on screens (Olfman, 2005). Walking 10,000 steps a day is recommended by the President's Council on Physical Fitness in order to produce long term health benefits (Blue Cross and Blue Shield Association, 2004), The American Journal of Public Health

published a study that found for each hour of television watched, there is an average of 144 fewer steps that are taken decreasing the probability that the desirable level of 10,000 steps a day is reached (Nagourney, 2006)

Television is just one of the many screen-based sedentary activities in which children engage. Computer and video games have become a popular screen-based activity with the current generation. Video games are considered an enemy to physical activity advocates as they consume children's attention typically in sedentary activity (Mileham, 2008). Regardless of the need for children to be active instead of engaging in video game play, video games are enjoyable, desirable, and children are motivated to play them.

Video Games and the Gamer Generation

We live in a technology driven society where electronic games, especially video games, have become a global attraction for children. In fact, 267.8 million computer and video games were sold in 2007 (Entertainment Software Association, 2008). Due to this fascination with technology-driven games, the current generation of children is being called the gamer generation. The total size of the gamer generation is already far greater than that of our previous generation of baby boomers. According to the game industry and bureau census data, it is estimated that there are over 90 million in the gamer generation compared to 77 million baby boomers (Lindstrom & Seybold, 2003). As the gamer generation continues to adapt to this electronic lifestyle, the children are visibly and measurable different than that of previous generations (Beck & Wade, 2004; Mileham, 2008).

The United States leads the way with internet saturation of 72.8 percent while 45% of urban gamers worldwide use the internet regularly. In addition, surveys show an astounding 68.3 percent of gamers who access the internet buy or download games to play online (Lindstrom & Seybold, 2003). Eighty-three percent of American children between the ages of 8 – 18 have one or more video game consoles such as Sony Playstation, Microsoft Xbox, and Nintendo GameCube (Foehr, Rideout, & Roberts, 2005). Eighty-six percent of children also have access to computers at home and 91% of those play video games on their computers (Chapman & DeBell, 2003). The amount of the time children spent playing videogames nearly doubled from 1991 to 2003 from 29 to 49 minutes per day (Foehr, Rideout, & Roberts, 2005).

What is so intriguing about video games that has the gamer generation attracted to playing? Koster (2005) suggests that the attraction to games is simply instinctive while Beck and Wade (2004) suggest "games deliver a 'reality' where the rules are quite different from any found out here in the rest of the world" (p.11). Games are a mix of entertainment content technology that are proven attention getters, respond to the player, reward technical skills, and are pleasingly simple allowing players to escape from boredom (Beck and Wade, 2004).

Although video games are often associated with the simple pleasure of frivolous play, they actually provide children with learning opportunities (Gee, 2005; Koster, 2005). Video games are great practice for real life. Games are models of reality, and teach players about the environment and spatial awareness (Koster, 2005; Mileham, 2008). Videogames are more effective than just watching television because they instantly engage the user in the decision making process (Beck & Wade, 2004; Gee, 2005).

Specifically, they provide a beneficial training environment for real life where collaborative problem solving is required. When playing games, gamers make a lot of choices, in a wide range of settings, in a short period of time and they seem to automatically care about the outcome.

The only big difference between games and reality is the risks are lower with games (Koster, 2005). Therefore, another positive characteristic of gamers is they learn failure is acceptable (Beck and Wade, 2004). Failure is a huge part of the gaming experience. Before winning most games, gamers will have failed hundreds of times. Because of this, gamers believe failure is part of the process which leads to success. Their attitude toward failure allows them to accept more risk and feel comfortable making mistakes, because from their perspective the risk is just part of the game. Allowing children to make mistakes seems to be a more effective way to learn than trying to constantly teach them (Koster, 2005).

The reasons children engage in an activity matter; children want an activity to be relevant and enjoyable. Fun is defined as a source of enjoyment. Fun from games arises out of mastery of learning skills and the solving of puzzles within the game. "…with games, learning is the drug" (Koster, 2005, p. 40). School may not be fun because it is taken more serious—it is not practice, it is real. If children are pushed by parents, teachers, or other external demands, they are more likely to resist the request (Koster, 2005). This generation of children is less accepting to authoritative figures teaching styles and would rather work with another peer or gain assistance via technology (Beck and Wade, 2004). Video and computer games are evolving to offer this assistance to

children. In fact, “that’s what games are, in the end. Teachers. Fun is just another word for learning” (Koster, 2005, p. 45).

Unfortunately, video games are considered sedentary activities occupying children’s time that would typically be spent being more physically active. As technology continues to develop, a new genre of video games have emerged. This new concept is called active gaming and is turning traditional video game play into a physically active activity.

Physical Activity and Gaming

Electronic media is such an integral part of life that it no longer holds any significant attraction in and of itself, especially to the gamer generation. In many ways, the heavy emphasis on technology we saw in the 1990’s has shifted. The computer with its valuable and intriguing abilities is now the vehicle for other activities. The emphasis is now on games, and how best to move through the levels, what modifications are available, and the release date of the next version. The introduction of interactivity in games is set to follow the same pattern of excitement that the computer provided, the only difference being that the period of market saturation will be shorter (Lindstrom & Seybold, 2003).

In the past, the emphasis during physical activity was on the intensity of the activity because the underlying philosophy was that the harder children are exercising, the greater the physical benefits. This approach has discouraged an entire generation not to participate in daily voluntary and involuntary physical activity. Today’s emphasis is on less intense, more moderate amounts of physical activity in hopes to encourage children to make physical activity a regular and sustainable part of their lives. Regardless, children

must view activity as a fun way to learn and grow or they are less likely to adopt it as a lifestyle. Hence the reason that having fun was rated by 86.2 percent as the most important element in adolescents' lives (Lindstrom & Seybold, 2003).

The current technology revolution has been criticized as being a significant cause of childhood obesity because it has captured the interest of children and has been adapted by them as a fun yet sedentary lifestyle. Videogames have long been considered an enemy to advocates of children being physical active; however, it is now possible they may join teams to assist one another in this inactivity crisis. There is a new genre of video games that requires players to physically move their bodies in order to control the actions in the game. The use of video game based technology-driven activities in order to increase physical activity levels in children is called active gaming or exergaming (Hansen & Sanders, 2008). Active gaming requires children to use their bodies to play the games instead controlling the game in a sedentary form. This innovative movement is trying to bridge the gap between exercise and fun by suggesting that children can become more physically active and reduce obesity levels while still playing the videogames they desire.

Although active gaming has just recently gained popularity, the concept of combining gaming and exercise surfaced almost 30 years ago (Bogost, 2007). Active gaming became more fashionable as the technology revolution began to take hold of society rapidly in the late 1990's. During this time, the capabilities of gaming consoles increased along with graphic quality, and with these improvements, prices began to fall. In 1998, Konami's *Dance Dance Revolution* (DDR) was introduced to the Japanese video arcades and quickly migrated to the United States. By the year 2005, there were 90

official versions of DDR, including those made for the residential game console. DDR is often considered the activity that has pioneered the active gaming industry. The popularity it has received, along with the growing epidemic of childhood obesity, has encouraged other manufacturers to support active gaming by producing new activities that continue to improve in quality. Since this movement began, many activities have been developed, such as virtual bikes, XrBoard, Cybex Trazer, Game Cycle, and virtual sporting games. Health clubs, YMCA's, JCC's, recreation centers, and schools have gained interest in active gaming and have incorporated the concept into their facilities in hopes that children will be encouraged to become more physically active.

According to Hansen and Sanders (2008) active gaming activities have been deemed by children as being:

1. Fun – Children do not even realize they are exercising. Children may be sweating but they are smiling and seem to enjoy the games.
2. Challenging – These activities offer a variety of self-motivating levels that children are able to progress through at their own pace.
3. Motivating – Walk into a room full of active gaming activities and you are immediately immersed in an atmosphere full of lights, noise, and plenty of action. Children are drawn to this environment.
4. Developmentally Appropriate – Active gaming activities are designed to meet the needs for all ability levels. Success is essential for children to continue to be physical activity and active gaming fosters such success.
5. Individualized – Active gaming provides a non-competitive environment without a focus on team sports. Children can create the competition level desired at their own discretion.
6. Contemporary – Children are living in a technology driven society that has ultimately changed every facet of the way we live from the way we think, work, and even the way we exercise. If we cannot beat this new generation, why not join them and bring technology-based physical activities to our children.

What does an active gaming environment look like? Imagine standing on a snowboard flying down a snowy mountain or dancing your heart away stepping to the beats of your favorite music while earning valuable points that will advance you to the next challenging level. You may even choose to jump on a bike and race a friend through an off-road course. These are just a few of the experiences children may have while participating in active gaming.

Research in Active Gaming

Although active gaming is a new concept in physical education and largely under researched, research continues to emerge supporting these modern day physical activities. There is evidence demonstrating that playing active computer games uses significantly more energy than playing sedentary computer games (Mellecker, R., McManus, A. 2008; Graves, Stratton, Ridgers, & Cable, 2008), and when playing active video games compared to sedentary video games energy expenditure more than doubles (Lanningham-Foster et al., 2006). Maddison, Mhurchu, Jull, Jiang, Prapavessis, & Rodgers (2007) found playing active electronic games resulted in moderate to high energy expenditure in children. Twenty-one children, ages 10-14yrs (11 males and 10 females) participated. Energy expenditure was significantly greater in the active videogames compared with the non- active video gaming conditions. The active video games resulted in significantly greater heart rate and activity counts compared with the non-active resting condition and there were no differences found with genders.

Additional research with active gaming activities include evidence that video game bikes are effective in enhancing exercise adherence, and significantly improve several markers of health status in sedentary college-aged males (Warburton et al., 2007).

Widan, McDonald, and Abresch (2006) found that the Game Cycle, an upper body ergometer active game, is an adequate exercise device to improve oxygen uptake and maximum work capability in adolescents. This study also reported the video game component is enjoyable and provides a motivation to exercise.

Dance Dance Revolution is a popular exergame used in schools and health facilities globally. A study with 22 overweight and normal weight children ages 11-17 found that DDR increases players' heart rates so that they obtain an aerobic workout and gain cardio-physiological benefits, even at the easiest levels of the game (Unnithan et al., 2005). The study found that all children raised their heart rate within the range for developing and maintaining cardio-respiratory fitness. The overweight children expended more energy to play than did normal weight children, but all raised their heart rate enough to reach an effective aerobic workout level. Another study looked at the exercise intensity of playing DDR at a medium level of difficulty and found that it met official standards for developing and maintaining cardio-respiratory fitness in an active and aerobically fit population (Tan et al., 2002). A third study, with 35 adolescents, found that DDR raised participants' heart rates to double their resting level during a 45-minute period, on average, and this is evidence that participation in DDR can achieve and sustain an aerobic exercise effect throughout a workout period (Hindery, 2005)

West Virginia Public Schools conducted a study that identified the impacts of the DDR on students in 20 West Virginia schools that used DDR in physical education and health classes, and found that some of the children lost five to ten pounds after playing the game every day during the first few weeks (Barker, 2005). Another West Virginia public school study with 35 overweight children ages 7 to 12 found that playing DDR at

least five times a week led children feeling more coordinated, less winded, and less self-conscious. The children developed stronger self-esteem, on average, improved their aerobic fitness, and reduced their chances for developing diseases associated with obesity, such as diabetes and heart disease. Study participants' parents reported that most of the children stopped gaining their typical three or four pounds a month and, with increased self-confidence, started exercising and playing sports regularly in daily life (Brubaker, 2006). Based on the positive results of these studies, the state of West Virginia has now included DDR in all 765 public schools and is developing a school-based DDR curriculum.

A study by Yang and Graham (2005) supported participation in DDR when they found that all but two children voluntarily chose to play DDR the designated 45 minutes allotted for activity time. This study also suggested that playing DDR can be classified as moderate to vigorous physical activity (MVPA) according to NAPSE guidelines. Another study suggests that ADHD children demonstrated improved reading comprehension when they participated in Dance Dance Revolution (McGraw, 2006). In addition, a pilot study examined the feasibility of playing DDR in participants home to increase physical activity time and decrease sedentary screen time. Results demonstrated that DDR reduces sedentary screen time and may facilitate slight increases in vigorous physical activity (Maloney, Carter, Kelsey, Marks, Paez, Rosenberg, Catellier, Hamer, & Sikich (2008).

It is important that active gaming be further researched to provide evidence that children enjoy the activities and are motivated to engage in them. Understanding

children's attitude toward physical activity is important in order to provide them with enjoyable experiences which may foster future participation.

Children's Attitudes toward Physical Education

Although physical education programs may vary in what is taught to children, a common denominator for most programs of value is the belief that enjoyment is one of the most important characteristics of quality physical education programs (Wechsler, McKenna, Lee, & Dietz, 2004). It is recognized that experiences in physical education that meet children's needs for fun and accomplishment within a social context will encourage future participation (Weiss, 2000; Robertson-Wilson, Baker, Derbinshyre, & Cote, 2003). In addition, research has shown children who find physical education exciting and fun are more likely to learn new motor skills and accomplish a level of competence (Ntoumanis, 2001). This notion is significant given children are often more motivated to engage in physical activity if they feel competent in the skills needed to perform a task (Sallis, Prochaska, & Taylor, 2000; Ferrer-Caja & Weiss, 2000; Ntoumanis, 2001; Weiss & Ebbeck, 1996; Vallerand et al., 1993). Clearly, success or failure in performing curriculum tasks can influence children's attitudes toward physical education (Graham, 1995).

Sollerhed, A. C.; Apitzsch, E., Rastam, L., & Ejlertsson, G., (2008) conducted a study to identify factors associated with, self-reported physical activity (PA), self-perceived physical fitness and, competence in physical education (PE) among children. The study included physical tests, anthropometric measures and a questionnaire. The study group comprised, 206 children (114 boys and 92 girls, aged 8-12 years). Correlations between children's self-perceived competence in PE and actual measured

physical performance, between the, self-perceived fitness any endurance performance and, between self-reported PA and physical performance could be seen as a form of concurrent validity. One implication suggested from this study for the physical education teacher might be that children's own perceptions of their physical competence and activity levels could be used to roughly identify groups of children who are at risk of remaining physically inactive and therefore more prone to be unhealthy. In another study by Couturier, L. E., Chepko, S., &Coughlin, M.A., (2007), 5000 students were surveyed, to collect data about attitudes toward physical education. The data was analyzed for gender differences, and while boys and girls responded similarly on many items, there were some significant differences based on gender. Boys and girls differed on activity preferences as well as responses to environmental and social obstacles. Girls were more interested in cooperative activities, fitness, and dance than boys. Girls also cited logistical issues, such as discomfort with showering and changing, as barriers to participation at higher rates than boys. This study suggests that physical educators need to consider the differing needs of girls and boys when planning and implementing the curriculum if they are to be successful in attracting and retaining the interest and participation of all their students. Additionally, another study investigated the relationships between perceived athletic competence and the fear of negative evaluation (FNE) in physical education, specifically with gender differences and with primary and secondary schools.. The participants were 192 children in three primary schools (N=85, mean age=9.5±1.1 years) and two secondary schools (N=107, mean age=14.5±0.8 years). Results indicated Girls had a higher FNE but lower perceptions of athletic competence than did boys. Older girls had a higher FNE and lower perceived competence than the remaining three groups.

Additionally, a significant and reverse but weak correlation was observed between girls' perceived athletic competence and FNE. The findings suggest that girls with a high FNE report lower perceptions of their athletic competence. Individuals who are high in FNE behave in ways to avoid the prospect of being evaluated negatively. However, they may seek feedback from significant others as a signal that unfavorable evaluations have been avoided. Therefore, positive, encouraging feedback used in physical education may foster feelings of competence in boys and girls and could reduce girls' social anxiety (Nicola, Della, & Stuart, 2007). These studies indicate there is an importance for physical education teachers to understand the perceptions of children in order to provide the most successful experiences in physical education possible.

A variety of studies have aimed to learn children's perceptions regarding physical education experiences by hearing their voices through interviews. Sanders and Graham (1995) reported that discussions with four kindergarten children suggested that children have a relentless persistence to play when physical education environments are less structured by the teacher, such as with stretching activities. Dyson (1995) learned that children enjoy their physical education experiences more when the emphasis is on personal goal setting and not comparing oneself to others. Dyson also learned that children are willing to express thoughts, feelings, and experiences when they had more choice and a voice with the instruction. Hopple and Graham (1995) wanted to discover what students of varying fitness levels knew and understood about the mile run test during physical fitness testing in physical education class. Results indicated that most students do not have a clear understanding of why they take the mile run and many students dislike taking the mile-run test so much that they become "test dodgers". In

addition, many students suggested they would change the mile run test to make it more fun if possible. Portman (1995) studied 13 6th grade children and learned that these children did not feel physical education was fun because they were not highly skilled. Portman suggested that it is reasonable to believe that if low-skilled children experienced some success and received support from teachers and their peers, they might experience physical education classes as fun. These studies suggest that hearing children's voices about their physical education experiences can and should be valuable for physical education teachers when providing children with appropriate physically active opportunities.

Graham (1995) discussed an interesting analogy regarding education's similarity to a business model. His main goal was to express the concept that education should "…satisfy its consumers, in this case the youngsters attending school" (364). Graham posed questions about students as the consumers in physical education, "What would they be thinking and saying about their physical education programs? Would they be satisfied consumers, or would they take 'their business' to fitness clubs and after-school programs at the YMCA or a gymnastics or dance studio?" (p.364). Graham further discussed the fact that as a profession, physical education teachers do not know how students feel about their programs and this needs to be addressed. He mentioned if a company were to guess at what the consumers liked or disliked about products, the company would more than likely not be in business long. Therefore, it is important for physical education teachers to find out how children feel about physical education in order to redesign and continue to improve the curriculum to satisfy the children.

Gender Appropriateness in Physical Activity

Another area of concern is gender differences related to physical education experiences. It is important to understand how and why girls and boys may not experience physical education equally. It is widely stated that physical activity levels decline during adolescent years for both boys and girls (Caspersen, Pereira, & Curran, 2000; Van Mechelen, Twisk, Post, Snel, & Kemper, 2000); yet, well established that boys' physical activity levels are greater than girls (USDHHS, 1996, 2000; Sherar, Esliger, Baxter-Jones,& Tremblay, 2007; Thompson, Campagna, Rehman, Murphy, Rasmussen, & Ness, 2005; Bungum, Dowda, Trost, & Pate, 2000). A Canadian study with normal-weight children (N=1057), found boys in the grades 3, 7, and 11 spend 9%, 22%, and 27% more time in moderate to vigorous physical activity (MVPA) than girls (Thompson, Campagna, Rehman, Murphy, Rasmussen, & Ness, 2005). A large sample (N = 2185) European Youth Heart Study demonstrated that 9- and 15-yr.-old boys spend 20% and 36% more time than girls in daily moderate physical activity (Riddoch, Andersen, & Wedderkopp, 2004). Another study measured MVPA in 410 children (194 boys and 207 girls) using accelerometers. Continuous MVPA (CMVPA) and vigorous physical activity (VPA) measures were also derived from the accelerometer data. Boys had higher MVPA levels at 10-13 years, higher CMVPA at 9-12 years and higher VPA at 9-13 years than girls (Sherar, Esliger, Baxter-Jones, & Tremblay, 2007). More specifically, the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development was a longitudinal study from 1991-2007 with 1032 participants (517 boys and 515 girls) at ages 9yrs and 15 yrs. The researchers measured the mean MVPA minutes per day, determined by 4 to 7 days of monitored

activity. The results demonstrated that boys spend 18 more minutes per weekday and 13 more minutes per weekend in MVPA than girls (Nader, Bradley, Houts, McRitchie, O'Brien, 2008).

For children to voluntarily participate in physical activity, both boys and girls suggest the activity needs to enjoyable and in a social environment (Weiss, 2000; Robertson-Wilson et al., 2003). Therefore, experiences in physical education that meet children's needs for fun and accomplishment within a social context should encourage future participation. Yet, one reason children do not find activities enjoyable and therefore do not engage in them is they lack the competency needed to enjoy the activity. In general, boys consistently report higher perceptions of their overall physical competence and are more positive than girls about their ability in most traditional sport and physical activities (Eccles, Wigfield, Flanagan, Miller, Reuman, &Yee, 1989). Boys also tend to be more positive toward physical education and appear to enjoy competition and risk taking. Girls, in contrast, often appear to enjoy only the aesthetics of movement experiences and the social aspects of class participation (Malina, Bouchard, & Bar-Or, 2004). Consequently, research suggests boys outperform girls in many motor tasks and the magnitude with the differences increases with age (Smoll & Schutz, 1990; Thomas & French, 1985).

In addition to girls feeling less competent towards physical activity than boys, research shows physical maturity influences adolescent participation (Sallis, Prochaska, & Taylor, 2000; Sherar, Esliger, Baxter-Jones, & Tremblay, 2007). As children begin to physically mature, physical activity levels have been shown to decrease (Sallis, Prochaska, & Taylor, 2000; Sherar, Esliger, Baxter-Jones, & Tremblay, 2007. Because

girls are known to mature more quickly than boys (Malina, Bouchard, Bar-Or, 2004), girls' physical activity levels may be lower than boys during adolescent years.

At an early age, children learn gender stereotypes and match their behavior to the information. They evaluate the appropriateness of their participation and effort accordingly (Solomon & Lee, 2008). Unfortunately, girls tend to perceive themselves as less competent regarding physical activity resulting in insufficient time spent in physical activity. Biologically, girls also mature more quickly than boys adding an additional reason activity levels are lower. The interest in studying gender differences in physical activity patterns is driven by evidence indicating the many health benefits of regular physical activity and the concern that females are at risk for health problems associated with inactivity (USDHHS, 1996). There are several intervention programs developed to help this problem of gender differences in physical activity: (1) Trial of Acivity in Adolescent girls (TAAG) (Stevens, Murray, & Catellier, 2005), (2) Project FAB, (Jammer, Spruijt-metz, Bassiin, & Cooper, 2004), and (3) Girls on the Move (Robbins, Gretebeck, Kazanis, & Pender, 2006). Each of these programs aim to provide girls with more daily physical activity.

Theoretical Framework

The following literature review discusses theoretical frameworks taken from play theory, The Zone of Proximal Development, Flow theory, and look at how each contributes to the foundation of active gaming.

Play Theory

Play is something children do because it is natural and they enjoy the experience. Children all over the world play regardless of the culture in which they reside. In fact, children will engage in play whenever the opportunity exists (Rogers & Sawyers, 1988). Some play theorists believe play is how children learn life skills (Johnson, Christie, & Wardle 2005; Koster, 2005), and how they learn about their world and their relationship to it (Davidson & Quinn, 1993). According to Fein, Rubin, and Vanenberg (1983) and Rogers and Sawyers (1988), there are six factors that make up what might be called the disposition of play: (a) Play is intrinsically motivated, (b) Play is relatively free of externally imposed rules, (c) Play is carried out as if the activity were real, (d) Play focuses on the process rather than any product, (e) Play is dominated by the players, and (f) Play requires the active involvement of the player. The concept of play may remain consistent; the way children engage in play continues to evolve due to the ever changing society in which children live.

Elements of Play. Play is intrinsically motivating and can be largely influential with children. Universally, play is considered intrinsically motivating – a child does not need to be directed to play. Play is not motivated by the basic needs or obligations, but by the intrinsic motivation for the enjoyment of play itself (Johnson et al., 2005); Fein, et al., 1983). When children are engaged in play, they are learning and enjoying every minute of it. Play does not need external rewards or additional intrinsic encouragement (Leeper, Greene, & Nisbett, 1973). External rewards may taint the child's own feelings and motives, and eventually even replace them. Self-paced, child-controlled play is the best way for children to make the most of their lives (Rogers & Sawyers, 1988).

Children need to be able to pick the level of skill and challenge with which they feel comfortable. Children who frequently experience failure or frustration with tasks that are too difficult are not likely to want to pursue the activity and may learn to avoid them (Rogers & Sawyers, 1988).

Another important element of play is that it is free of externally imposed rules. In physical education classrooms, if curriculum is saturated in direct instruction it does not allow the children the freedom to play. Teachers may "over teach" or not allow children time to explore and discover their learning. When adults interfere inappropriately with play, children's interest will diminish and the activity they are engaged in may cease (Rogers & Sawyers, 1988). As well as if more rules and structure are implemented, the need for external feedback will increase. If adults take too much control of an activity, children may begin to feel helpless (Seligman et al., 1984) and their self-esteem and sense of competence is affected by this feeling of not being in charge of their own play experience (Connell, 1985). Children who have a strong sense of self-worth are much more likely to be well rounded, mature individuals (Rogers & Sawyers, 1988).

Play and Development. Although play is most often associated with young children, children of all ages and adults need to play. It is unfortunate play is often referred to as "fun" or frivolous as many believe play lacks the rigor that learning or work desires (Elkind, 2007; Koster, 2005; Johnson et al., 2005). On the contrary, researchers consider play as an important element in life to achieve optimal development. Play is perhaps the only human behavior that integrates and balances all aspects of human functioning as it is a necessary component for all of us to develop our full potentials (Rogers & Sawyers, 1988). Play has been long recognized as a critical aspect of child

development. Play at a minimum reinforces cognitive development with respect to representational competence, operational thought, and problem solving; yet, also serves as a context and vehicle for the expression and consolidation of development, providing opportunities for new learning (Johnson et al., 2005). Play is an active form of learning that unites the mind, body, and spirit (Levy, 1978). The American Academy of Pediatrics (AAP) recently published a study entitled: "The Importance of Play in Promoting Healthy Child Development and Maintaining Strong Parent-Child Bonds". The report states that free and unstructured play is not only healthy, but essential for helping children reach important social, emotional, and cognitive developmental milestones as well as helping them manage stress and become more resilient (Ginsburg, 2006).

Recently, valuable information regarding the powerful impact that play has on brain development has been emerging. Play keeps children's minds actively involved in interacting with the environment and results have shown that optimal brain development occurs when the child interacts with the environment and the environment is responsive to that interaction (Johnson et al., 2005). Play experiences mediate brain development first by helping with the creation of the large number of synapses that are formed in the first three years and then by helping with the formation of the more complex neuronal structures that are created over the childhood years (Elkind 2007; Johnson et al., 2005). For this to occur, play must be meaningful to the child, adding to the child's understanding of the world and ability to adapt. Play can then optimally stimulate brain activity and growth and produce a positive change in structure of the brain (Johnson et al., 2005).

Prominent researchers in the field of psychology have viewed play as a critical trait to the human species (Patrick, 1996). Lev Vygotsky (1987) pointed out the importance of play in his theories in regards to both social and cognitive development. He believed play has its origins in emotions and it helps children cope with frustration. In his theory of the Zone of Proximal Development, skills that have not quite emerged can be further developed with the assistance of another more skilled peer or adult. (Miller, 2002; Patrick, 1996; Mooney, 2000; Vygotsky, 1987). This adult or peer stimulation is often capable of sustaining a child's play (Caldwell, 1995). In addition, Johnson et al. (2005), suggest that play alone promotes development by serving as a scaffold within the children's ZPD helping them to attain higher levels of functioning. In fact, play was so important to Vygotsky that he suggested it actually creates a child's Zone of Proximal Development:

> "Play also creates the zone of proximal development of the child. In play, the child is always behaving beyond his age, above his usual everyday behavior; in play, he is, as it were, a head above himself. Play contains in a concentrated form, as in the focus of a magnifying glass, all developmental tendencies; it is as if the child tries to jump above his usual level"(Vygotsky, 1978, p.74).

Piaget believed that children are able to learn only when their curiosity is not fully satisfied. He believed that children's curiosity actually drives their learning (Miller, 2002). Piaget suggested that children learn best when they are playing and actually doing the work themselves and creating their own understanding of what's going on, instead of being given explanations by adults. He believed children need every possible opportunity to have control of their activities and play (Piaget, 1963). As children mature, it is common to believe that their skills develop and the way they play may

change. Play becomes more complicated with age as children begin to manipulate environments or change reality when they become less dependent on toys or materials and begin to use their imaginations (Rogers & Sawyers, 1988). Piaget originated the stages, the taxonomy of play, he thought children experienced as they continue to develop (Piaget, 1963). His practice stage, symbolic stage, and games and rules stage explain how play changes as this maturation occurs. According to Piaget, children ages 7-12 years reside in the Games with Rules stage. In this stage activities begin to involve motor skills and rules and generally involve symbols because children are able to think more logically and systematically. Children are more likely to engage in play but set boundaries and parameters within the play activity. Team sports and self-imposed competition become more popular during this stage as children become more attracted and desire to accept games with rules.

Diminishing Play. Research suggests discouraging children's play is harmful to healthy development as children use play to foster cognitive, social, and emotional development (Elkind, 2007; Ginsburg, 2006; Johnson et al., 2005). However, in recent years, children's play has become less prevalent because of the high-tech commercialized world we have created. Outdoor pickup games that once filled neighborhoods have largely been replaced by organized team sports and computer games. Children's lives are being controlled by adults more and more with little time for free play. Karate class, music lessons, or sport sessions occupy much of a child's free time after school – all of which are instructed and controlled by an adult. Even our schools are now contributing to the suppression of curiosity, imagination, and fantasy by eliminating recess in favor of

more time for academics and the physical education programs are imbedded with direct adult instruction.

For the programs that are available in schools today, physical education practices often put an end to fun and free play as soon as the child enters first grade (Patrick, 1996; Rogers & Sawyers, 1988). Our society poses rules on children and wants them to hurry and learn the rules without the exploration procedure allowed. Physical education classes add structure and too many rules to activities involving skill development when they need to let children have more choice and control over activities in which they participate. A problem exists if the activity is not meaningful, skills learned in a highly structured setting will not necessarily transfer to other settings (Linder, 1993) and become useless to the child.

Instead of this adult imposed structure, Rogers & Sawyers (1988) suggest schools should offer a safe environment, be sensitive to and responsive to children's play, and offer toys or games which provide sensory stimulation or feedback. Children need to enjoy an activity and want to voluntarily participate in physical play. Unfortunately, children are suggesting traditional activities are not fun and as a result are not engaging in play. One result that has occurred from this reduction of play is the increase in childhood obesity. Type 2 diabetes which used to be rare in children is now becoming more common (Sutterby & Frost, 2002). Because play in the form of physical activity is enjoyable, physical play develops in each child a disposition toward physical activity – a positive habit which is continued in the future (Katz, 1985). Providing children with play activities they enjoy will help to increase voluntary physical activity time and reduce the hours spent in sedentary engagements.

Games and Technology. Piaget suggests as children mature they pass through certain stages in cognitive develop and the way they engage in play will change. As mentioned previously, Piaget defines one type of play as game play. Game play is a popular form of play for children all over the world. Games, in general, are a cognitive advanced form of play that requires children to conform to some kind of external rules while offering an enjoyable means for children to learn new academic skills and to practice skills that have already been taught (Johnson et al., 2005). Kamii and Lewis (1992) suggest that play of games compared to traditional drill-and-practice are more beneficial for children because of three major concepts:

1. In games the motivation to work comes from the children.
2. In games children invent their own strategies and ways of achieving their goals.
3. In games children supervise and correct each other which foster peer interaction.

Beck and Wade (2004) suggest "games deliver a 'reality' where the rules are quite different from any found out here in the rest of the world" (p.11). Therefore, if games are models of reality, then the things that games teach us must reflect on reality (Koster, 2005). Some games teach children about the environment and spatial awareness (Koster, 2005) while other educational games may teach content related to nutrition, exercise, math or science. Since games are teaching tools, children seeking to advance in a game will always try to optimize what they are doing. This often leads to making many mistakes in the game which they are able to problem solve and continue playing. In the modern society, it seems as if children have a more difficult time learning when they are being taught; they need to make mistakes themselves to encourage the learning and if they are pushed by parents, teachers, or even their own logical brains, they often strongly

resist (Koster, 2005). Game play is an effective teaching tool that provides children with an encouraging approach to learning.

Simulations are games based on a model of a real situation designed to teach principles which operate a particular situation (Clegg, 1991). Simulation games tend to be more complex than dramatic play and other types of games and lend themselves to teaching academic concepts and skills. Because children playing simulation games engage in role playing and fantasy, simulations are regarded as being playful and fun which leads to high levels of engagement and effort (Johnson et al., 2005).

One genre of simulation games is video games. Although video games are presently one of the fastest growing industries (EAS, 2006), they have been a part of our society for years. Looking back in the early 1900's, video games and computer games have continued to evolve and develop to suit the maturation of our culture (Koster, 2005). Since children are living in a society immersed in technology, they often find modern electronic games more attractive than traditional games. Koster (2005) believes that the attraction to electronic games by children is instinctive because they find these games intrinsically motivating and more fun to play. Even computer programs and games for infants, toddlers, and preschoolers are growing in number and becoming more popular with the belief that this play will prepare them for the demands of a technology driven and demanding society (Johnson et al., 2005). Computer programs engage a child in active thinking and problem solving providing them with a cognitive benefit (Johnson et al., 2005). Another important academic concept is that video game and computer game play can help solve the problem of individual differences in learning since curriculum materials can be presented in different game formats addressing differences in learning

styles and ability patterns (Johnson et al., 2005). There is a game for everyone as they offer different patterns of interests, talents, and abilities.

The stage independent part of Piaget's theory is influential when discussing game play using technology. Learning is defined as the construction of new knowledge resulting from the resolution to a conflict (Rieber, 1996). According to Piaget, learning can only occur when an individual is in a state of disequilibrium or when mental structures or schemes are not in "balance" (Piaget, 1952). When an individual arrives at a resolution or solution to this imbalance, the situation is solved as fitting an established mental structure (assimilation), or a new structure is formed (accommodation). Assimilation is the process of understanding the world through existing schemes, whereas accommodation is the process of building new schemes based on the refinements or blending of existing schemes (Piaget, 1952). If there is no resolution to the disequilibrium, no learning takes place. Electronic games serve as a vehicle for both play and imitation, two functions that Piaget (1951) considered crucial to the equilibration process (Rieber, 1996). Piaget considered play as an assimilation strategy and imitation as an accommodation strategy. Play, as noted earlier, is intrinsically motivating, child centered, and enjoyable. Imitation refers to the reproduction or performance of an act stimulated by the perception of a similar act by another person (Encyclopedia Britannica, 2008). When children are involved in digital game play, they are able to use both play and imitation to create learning experiences through the construction of new mental schemas (refine existing schemas) and through existing mental schemas. What the children experience during the digital game play may be imitated in a real context or the real context is practiced during the game play.

When playing games, especially video games, fantasy is often used to encourage children to imagine that they are completing an activity in a context in which they are really not present. This fantasy context can be further classified as being either endogenous or exogenous to the game's context (Reiber, 1996). Reiber (1996) suggests with exogenous games, the game is easily separated from the content; unlike endogenous games, which weave the content into the game. Physical educational games intend to serve the purpose of endogenous games by initiating learning through the play of games. It is with the endogenous games that children are able to experience more intrinsic motivation and encouragement for learning (Reiber, 1996).

Although many may continue to doubt the use of technology in fostering play habits in children, beliefs about play are beginning to change due to the alterations with new digital devices. Researchers are beginning to understand new forms of play have been made possible by technology and they are learning that elaborate forms of play can be stimulated through the use of certain computer software (Johnson et al., 2005). When children are playing games they often refer to the experience as having fun. Games in the digital form have become a popular aspect of play and can be an effective approach to learning. Koster (2005) suggests, "That's what games are, in the end. Teachers. Fun is just another word for learning" (p. 45).

The Zone of Proximal Development

Vygotsky's sociocultural theory continues to have a strong influence in many educational practices. The major theme of Vygotsky's theoretical framework is social interaction plays a fundamental role in the development of cognition. Vygotsky believed personal and social experience cannot be separated; therefore, the world children inhabit

is shaped by their families, communities, socioeconomic status, education, and culture. He showed that children's cognitive development is affected not only by their physical development, but also by their social surroundings and interactions (Mooney 2000). Vygotsky (1978) stated: "Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people and then inside the child." (p57).

An important aspect of Vygotsky's theory is the potential for cognitive development depending upon the "zone of proximal development" (ZPD). Vygotsky (1978) defined ZPD as 'the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers' (p. 86). There are basically two levels associated with a child's zone of proximal development. The lower level reflects what the child can already do independently and the higher level reflects what the same child can do with assistance (Bodrova, 2003; Beliavsky, 2006). The space between these two levels is the zone of proximal development. The assistance given can be in the form of a more competent adult or peer. The range of skill that can be developed with this guidance or adult/peer collaboration exceeds what can be attained by the child alone. Vygotsky referred to the assistance a teacher or peer offers a child as scaffolding. This assisted performance entails the active mediation between what is known and what is yet to be known by the students (Miller, 1993; Salomon, 1998; Subramaniam, 2007).

The zone of proximal development defines those functions in a child which have not yet matured but are in the process of maturation. A group of children may have equal

levels of mental development, but their capability to learn under a teacher's guidance could vary considerably (Vygotsky, 1978). Some children will benefit more than others. The difference between independent performance and aided performance seems to be peculiar to each child. Vygotsky believed the measurement of ZPD is a more accurate way to predict the child's future development or potential then by simply using a standardized test (Beliavsky, 2006). Therefore, a child who is able to profit from assistance with a task has a larger ZPD and will essentially do better in school based on the idea that learning has occurred and the previous task can now be completed independently (Beliavsky, 2006).

In accordance with Vygotsky's zone of proximal development is the notion child's cognitive development occurs within a social milieu (Beliavsky, 2006; LeBlanc & Bearison, 2004). The teaching-learning process (instruction) does not occur in isolation. The role of instruction for enhancing cognitive development is a joint activity – a collaborative effort between the child and assistance by a more knowledgeable partner such as a parent, a peer, or a teacher (Beliavsky, 2006). The instructional information presented by the teacher is a reflection of both the instructional requests presented by the learner and the teacher's perceptions of the instructional needs of the learner. The way a teacher provides information to a learner is influenced, among other things, by his or her perception of the learner's cognitive abilities (Bruner, 2006). This perception is directly influenced by the prior interactions between that teacher and learner (LeBlanc & Bearison, 2004). Brophy (1999), also known for his motivational ZPD theory, contends the features of an activity must be aligned with the learner's prior knowledge and experiences in such a way as to stimulate interest in pursuing the learning. This would

occur when the activity is familiar enough to the learner to be recognizable as a learning opportunity and attractive enough to interest the learner in pursuing it.

In the present culture that is driven by digital technological games, children enjoy video games and also enjoy being engaged in 'exploration' of these games in the social environment with others. However, they may reach a stage where they may need assistance from a more competent counterpart to advance their skills. Children participating in these interactive activities seem to naturally be more inclined to helping one another. Beck and Wade (2006) suggest that this generation enjoys strategy guides and prefer to learn from one another, not their elders as they are not as motivated by authority figures' demands. This peer scaffolding offers a great opportunity for social interaction and leadership roles to emerge. At the Summit on Educational Games, 2006, it was suggested "games and simulations can offer scaffolding, providing learners with cues, prompts, hints, and partial solution to keep them progressing through learning, until they are capable of directing and controlling their own learning path" (p.19). In this sense, the video game itself may become the guidance needed for the children to further develop these skills as they learn to use the tools provided on the screen to enhance their level of play.

Vygotsky (1987) believed learning is a social process before it is an individual function. He stated that learning processes are not synonymous with internal development but consist of a unity in which 'one is converted into the other' (91). If instruction proceeds ahead of development but leads development then the instruction is within the zone of proximal development (Vygotsky, 1987) and it is in this sense that

development and instruction are inseparable. Learning how a child responds to assistance guides how the learning precedes development (Rowlands 2000).

Wertsch (1985) suggests that we should not concentrate on the product of development, but instead on the process. The ZPD treats cognitive development as a development in process and change rather than as an-end-product established as a set of discrete levels. To understand the maturation of a child as a process, teachers have to facilitate the child's completion of a task in which the child cannot do unaided (Rowlands, 2000). How a child responds to the mediation in completing a task enables us to explain the abilities of the child as they mature, rather than simply describe the abilities that have already developed (Rowlands et al., 1996).

To engage children in the processes of learning and development, we must know who they are and where they come from (Delpit, 1995). Vygotsky's theory requires us to pay attention to the cultural contexts in which children are situated, to interactions between children and those who are more competent in skills, customs, and practices valued by the culture, and to what the children themselves bring to develop and understand during the interactions (Scrimsher & Tudge, 2003). Teachers have to understand the historically derived differences in backgrounds and the implications for interactions between our students and themselves. They also have to learn how to learn from their students, changing the traditional teaching mode that many still use in classrooms to one that allows a more collaborative learning process to develop, one in which teachers learn as our children are learning. Taking Vygotsky's theory seriously implies that we try to learn from our children while teaching them, as well as having the children teach teachers

while learning. Classrooms must therefore be designed, both physically and conceptually, to allow this to happen (Scrimsher & Tudge, 2003).

Today's children live in a culture where technology is shaping their learning and development. Within the context of teaching with computer technology (the physical tool), there is potential for mediation within the zone of proximal development by the teachers' psychological insights (psychological tools) as students interact with teachers, curriculum, and computer technology (Subramaniam, 2007). Teachers' roles are more than spatial and temporal movements in the classroom; teachers teaching with computer technology work at different and complex levels. Looking at participants' teaching with the integration of computer technology from the zone of proximal development construct reveals that the mediation process involves more than just the interaction of cultural tools (Subramaniam, 2007). Assisted performance within the zone of proximal development is achieved through the participants' perceptions of access, engagement and membership. Students are considered as part of the teaching-learning processes; this enables students to construct their own knowledge and not just pick up concepts from the computer technology (Subramaniam, 2007).

Adult-guided Instruction. Vygotsky also suggested a theory on adult-guided instruction. Because he was a constructivist, Vygotsky believed that children construct their own knowledge and do not simply mirror what is being taught to them (Bodrova, 2003). In Vygotsky's view, a child's knowledge is not simply modified by other people or cultural artifacts, such as technologies, that make up the environment – these things actually shape both the content and the nature of this child's emerging cognitive functions (Bodrova, 2003). Vygotsky proposed a distinction between spontaneous

concepts and scientific concepts. He believed spontaneous concepts could be discovered through a child's independent exploration but the scientific concepts need a type of formal instruction (Vygotsky, 1987). This formal instruction he described as assisted discovery, where the child integrates the results of his/her independent discoveries with the new nonempirical knowledge taught in a systematic and structured way. The teacher's goal in the assisted discovery method is to provide the child with specific "cultural tools" that will allow him/her not only to solve problems at hand successfully but will also contribute to the development of more advanced mental competencies. The child's role is then to take the tools and apply them within the context first and then adapt them outside of the context (Bodrova 2003).

According to Litowitz (1993), the use of the ZPD 'can come perilously close to a description of learning as a neobehaviouristic shaping of behavior' (p. 190) and that it is an 'adultocentric' view of the child's behavior which is 'too exclusively concerned with what is being done by the dispensers of knowledge' (p.190). Litowitz (1993) proposes, as a better 'capture' of the child's perspective, Winnicott's 'potential space' which is the range of the child's control, power, and supremacy. 'In that space, the child sees himself as more capable than he really is' (p. 190). If there is no correct understanding of what the ZPD really is, then it becomes a sign for the various individual pedagogical perspectives. For example, if the ZPD is regarded as too 'adult orientated', then it will be better to have a child orientated metaphor, such as 'potential space' that represents what the child doesn't know or understand. Litowitz argues that the benefit of 'potential space' unlike the ZPD includes fantasy and illusion. Litowitz prefers Winnicott's

'potential space' because of the inclusion of 'fantasy' and because it reminds us of where the child is coming from.

Flow Theory

Motivating children to be physically active can be a difficult challenge for physical education teachers. Motivation is defined as being an internal state that arouses, directs, and sustains human behavior (Aultman, Glynn, & Owens 2005). Motivation is associated with students' desire to participate in activities. Although students may be equally motivated to perform a task, the foundation of their motivation may differ. A student who is intrinsically motivated undertakes an activity for the enjoyment it provides or the feelings of accomplishment it evokes (Lepper, 1988). An extrinsically motivated student participates in an activity in order to gain some reward or avoid punishment. Extrinsically oriented students are inclined to put forth the minimal amount of effort necessary to get the maximal reward (Lepper, 1988). The efforts students are likely to invest in a task will be determined by how much they value the rewards associated with successfully completing the task and the degree to which they expect to be able to succeed on the task (Brophy & Good, 2000).

Students who are intrinsically motivated to perform a task often experience "flow" (Aultman et al., 2005). Csikszentmihalyi believed that people are most happy when they are in a state of flow or a state of total oneness with the activity at hand and the situation. The flow state is an optimal state of intrinsic motivation, where the person is fully immersed in what he or she is doing (Csikszentmihalyi, 1975b). Csikszentmihalyi (1990) described flow as being an experience that is so gratifying that people are willing to do it for its own sake or with little concern for what they will get out of it, even when it

is difficult. An important precursor to a flow experience is a balance between the persons' skills and the challenges associated with the task or activity. If the task is too easy or too difficult, flow cannot occur (See Figure 2).

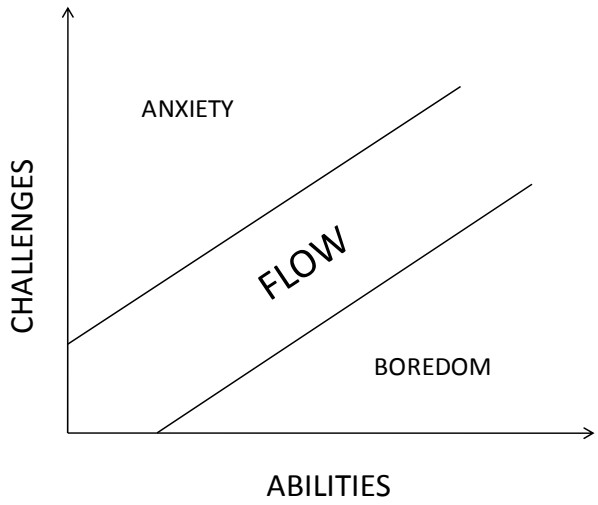


Figure 1. Csikszentmihalyi's flow state. From *Beyond boredom and anxiety: The experience of play in work and games, by M. Csikszentmihalyi (1975).*

Elements of Flow. Through interviews and questionnaires with basketball players, dancers, musicians, rock climbers, and surgeons, Csiksentmihalyi (1975a, 1975b) theorized 9 components of flow:

1. *Balance between a challenging activity with an individual's skills.* The accepted activity must represent a certain perceived challenge to the individual and must be balanced with the individual's skills.
2. *Clear goals.* Prerequisite to an optimal experience is a clear, non-ambiguous goal. This helps focus attention and discriminate between relevant and irrelevant information.
3. *Immediate feedback.* The activity itself should provide clear, specific feedback to the person's.
4. *Merging of action and awareness..* An individual in flow is aware of his or her actions but not of the awareness itself.
5. *Intense concentration.* The merging of action and awareness is made possible by a centering of attention on limited stimuli in the field.
6. *Loss of self consciousness.* Although a person becomes less self aware in flow, they do not lose touch with their physical reality. In most flow activity one becomes more intensely aware of internal processes.
7. *Sense of Control*. During flow, rather than feeling that the activity must be mastered, individuals usually feel that their skills were adequate to meeting the challenge of the activity creating a sense of control.
8. *Intrinsically motivated.* A flow experience needs no goals or rewards external to itself. Individuals voluntarily participate in the activity because it is enjoyable, not because they have been instructed to do so.
9. *Altered sense of time.* In a flow experience, the individual is in such an intense state that time no longer seems to pass in a typical manner.

Csikszentmihalyi (1990) states not all components are needed for an activity or technology to give users the experience of flow; yet, most of today's video games incorporate all components (Chen 2007).

Research in Flow. There are a variety of studies that have looked at Csikszentmihalyi's (1975, 1993) flow theory in terms motivation, skill development, and engagement. O'Neill (1999) adapted the theoretical and methodological approach used in flow theory to examine motivational and social factors associated with young musicians' development of musical performance skills concurrent with, and in the context of, their everyday life experience. The study employed the Experience Sampling Method (ESM), developed by Csikszentmihalyi to record young musicians' descriptions of thoughts and activities at random moments during the course of a typical week. The experiences of three groups of young musicians aged 12-16 years were examined: high achievers from a specialist music school (n=20), moderate achievers from a specialist music school (n=20), and young musicians from a non-specialist state school (n=20). The results indicated that high achievers spent significantly more time practicing during the course of the week than average achievers from both schools. Analyses of data collected revealed a significant difference in the extent to which the young musicians in each group reported "flow" experiences when engaged in musical compared with non-musical activities. In particular, high achievers at the music school and students at the non-specialist school reported more "flow" experience when practicing than the moderate achievers at the music school.

In a longitudinal study a sample of 526 high school students across the United States were investigated in order to learn how adolescents spend their time in high school and the conditions under which they reported being engaged. Results indicated participants experienced increased engagement when the perceived challenge of the task and their own skills were high and in balance creating a Flow experience (Shernoff, Csikszentmihalyi, Schneider, Shernoff, 2003). Another study investigating the effects that perceived challenges and skills in activities have on the quality of everyday life experience used The Experience Sampling Method (ESM) on a sample of 208 talented adolescents to measure daily variations in four dimensions of experience (concentration, wish to do the activity, involvement, and happiness) in four contexts (in school, with relatives, with friends, and in solitude). Findings confirmed the prediction of flow theory that the balance of challenges and skills has a positive and independent effect on the quality of experience (Moneta & Csikszentmihalyi, 1996). Additionally, researchers investigated the relationship between motivation and affect in upper elementary mathematics classes from the perspective of flow theory. The researchers examined the relationship between students' motivation and teachers' instructional practices. Students' reported classroom experiences formed 4 factors--Social Affect, Personal Affect, Efficacy, and Challenge/Importance. On the basis of student reports, the researchers concluded that (a) affect is essential to student experience in mathematics lessons, (b) skill is perceived in conjunction with affective variables, (c) challenge is identified as a threat to students' efficacy, and (d) importance of a task is more relevant to motivation than is its challenge. A qualitative investigation of teacher instructional discourse suggested that the following teacher practices related to student motivation: (a) provision

of substantive feedback and clarification of concepts; (b) support for autonomy, cooperation, and social relatedness; and (c) emphasis on learning for its own sake. Results suggest that emphasizing the balance of challenge and skill, supporting self-efficacy and value for mathematics, and fostering positive affect can enhance student motivation in the classroom (Schweinle, Meyer, & Turner, 2006). Furthermore, a study investigated whether flow occurs in the foreign language classroom and from what sorts of tasks it might likely result. Data was collected from one class of 13 fourth-semester, secondary school Spanish language learners and their teacher. Findings indicated that flow seemed to occur in this Spanish foreign language classroom and suggested that teachers can theoretically facilitate the flow experience for students by developing tasks that might lead to flow (Egbert, 2004). These studies suggest it is not only important to provide children with opportunities to experience flow in order to foster motivation in a task, but they also discuss the importance of children engaging in tasks in which their skills are in balance with the challenge provided.

Flow Research in Physical Activity Environments. The use of Flow Theory to examine the quality of physical activity experiences is a growing phenomena. Jackson (1992) surveyed 16 national figure skating champions to learn how they defined their deepest flow experience. Although 13 skaters originally admitted that they were not familiar with the term, they all agreed that a flow state was an apt descriptor of their most optimal experience and one where they experienced high levels of satisfaction and would remember for the rest of their lives. Such experiences were characterized by high ratings of challenge and skill, high levels of attention, clear objectives, focused concentration, perceived control, enjoyment, clear feedback, altered sense of time, and being at the

"cutting edge". General qualifications of flow included positive mental attitudes, positive pre-competitive and competitive affect, maintenance of appropriate focus, physical readiness, and partner unity. Similar qualitative results were also uncovered with 28 elite athletes representing a variety of sports (Jackson, 1996).

Jackson and Roberts (1992) took a quantitative approach to gain an understanding of flow states of 200 collegiate athletes from a variety of varsity sports programs. Results indicated the frequency of flow was predicted by perceived ability and task orientation. In addition, those who reported high levels of mastery and perceived ability reported significantly higher levels of flow as measured by a flow state questionnaire. When describing their best and worst athletic performances, athletes reported significantly higher scores on the flow scale during their best athletic performances compared to their worst performances. The best performance descriptions were also characterized by high perceived challenge and skill values while low performance descriptions were characterized by high perceived challenge and low perceived skill values. Interviews asking athletes to describe their best performances indicated that terms such as focused attention, enjoyment, control, focused concentration, mind and body unison, and clear goals were prominent.

Chalip, Csikszentmihalyi, Kleiber, and Larson (1984) used the ESM procedure to compare adolescents' physical activity experiences within organized sport, physical education and informal sport environments. The results revealed that the adolescents reported significantly higher levels of positive mood in informal sports and physical education classes and a significantly higher sense of skill competence and motivation in

informal sports. In addition researchers found that sense of control was highest in physical education classes and lowest in informal sports, sense of skill was lowest in physical education classes, and the level of what was at stake was higher in organized sports than informal sports or physical education classes. In applying the flow theory to the three environments, participants were more likely to report a balance between skill and challenge in informal sports and were more likely to report challenges exceeding the skill levels during organized sport and physical education classes. Kleiber, Larson, and Csikszentmihalyi (1986) reported that compared to other daily activities that adolescents did, games and sports resulted in higher amounts of intrinsic motivation, perceived freedom, positive effect, concentration, and challenge. Compared to other courses in school, adolescents reported their highest level of affect and activation during physical education (Csikszentmihalyi & Larson, 1984).

In an attempt to evaluate children's experiences in a physical activity environment using flow theory as a theoretical framework, Mandigo and Couture (1996) asked children ages nine to 14 to rate their perceived challenge, skill, fun, boredom and state anxiety immediately following six specific activities in a new physical activity program that was integrated into their physical education classes. The results demonstrated that when participants were coded in the flow quadrant (i.e., higher than average skill and challenge), they were more likely to report higher levels of fun than when they were coded in the anxiety (i.e., higher than average challenge and lower than average skill) and apathy (i.e., lower than average challenge and skill) quadrants. Sanders and Graham (1995) reported that kindergarten children were in a flow state when their skills and interests were at a level to successfully complete a task in physical education without

being bored or frustrated. This balance was often reached when children were allowed more control of their environment through play as opposed to more structured activities proposed by the physical education teacher.

These findings demonstrate that participants who experience a flow state during physical activities often report a high level of optimal experience. Optimal experiences are characterized by high levels of intrinsic motivation, perceived freedom, positive affect, concentration, challenge, skill development, enjoyment, satisfaction, clear objectives, peak performance, positive mental states, and perceived success. The variables that contribute to producing a flow state or quality physical activity experience are essential in creating environments where participants choose to voluntarily participate or participate for an extended period of time.

Video Games and Flow. An individual experiences flow most often in activities with clearly established rules for action, such as in games (Csikszentmihalyi, 1975a). Games have been defined as being voluntary and enjoyable, separate from the real world, lacking external rewards, and governed by rules (Caillois, 1961).

One popular form of games today is the video game (Koster, 2005). Researchers suggest people play video games and computer games because they are fun and entertaining (Koster, 2005; Sweetser & Wyeth, 2005) and believe children who are heavily exposed to video games are likely to develop a new attitude toward learning (Zuhal, 2003). Parker and Lepper (1992) examined the use of fantasy in instructional programs and found that learning was enhanced when content was embedded in such contexts.

Chen, (2007) suggests the description of Csikszentmihalyi's Flow Theory appears identical to what a player experiences when totally immersed in a video game. Although Csikszentmihalyi (1990) states not all components are needed for an activity or technology to give users the experience of flow, most of today's video games incorporate all components (Chen, 2007). In addition, video game play will continue only if the individual's greatest effort and involvement optimally matches the demanding levels of the contents of the game. In this sense, the flow state should be understood as the result of an optimal balance rather than a simple match between skill and challenge in a given situation (Chen, 007). Individuals value video games and will continue game play based on whether or not the games can provide flow experiences (Holt, 2000).

The length of time that children remain engaged in video games depends on the duration of their flow experiences and whether or not they reach the Flow Zone (Sweetser & Wyeth, 2005). Different "gamers" will have various skills and need challenges specific to their personal skill levels. The novice gamer will need challenges that are less demanding than those desired by a "hardcore" gamer to stay in "the zone" (Chen, 2007). Figure 3 depicts the flow zones for players of varying skill levels.

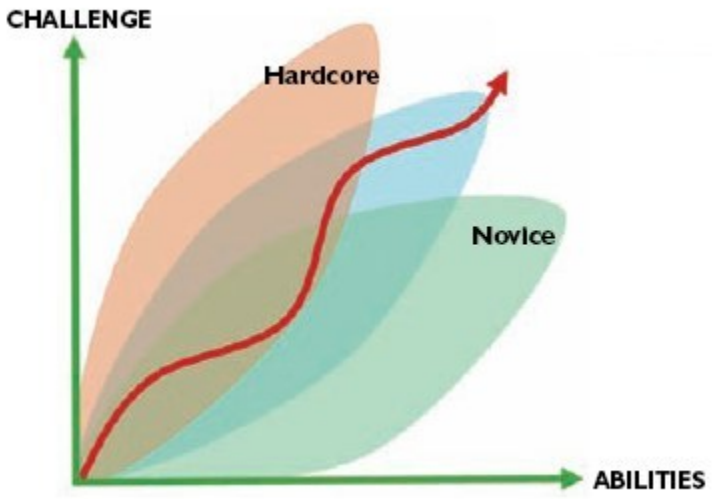


Figure 2. Different players have different flow zones. From "Flow in Games (and Everything Else)," by J. Chen, 2007, *Communications of the ACM, 50*(4), p. 32.

Summary

Learning more about the perceptions of children regarding physical activity is necessary in order to better understand the childhood obesity epidemic. The purpose of this research was to explore the experiences of six fifth grade children as they participated in active gaming during physical education classes. In my inquiry I also explored the experiences of three boys and three girls as they participated in active gaming. This review of literature assists in this task by providing a foundation from which to begin.

Chapter 3

Methodology

The purpose of my research was to explore the experiences of six fifth grade students as they participated in active gaming during physical education classes. In my inquiry I also explored the experiences of three boys and three girls as they participated in active gaming. I used qualitative methods to collect and analyze data for the study that included interviews, observational field notes, and journal entries. I describe these methods in sections that follow.

The following questions guided my inquiry:

1. What are the experiences of six fifth grade students as they participated in an eight week active gaming unit in physical education class?
2. What are the experiences of three fifth grade boys and three fifth grade girls as they participated in an eight week active gaming unit in physical education class?

Case Study Design

In this inquiry, I employ case methods. In addition, I applied a phenomenological framework with the case study design.

> "A case study is expected to catch the complexity of a single case. A single leaf, even a single tooth pick, has unique complexities… We study a case when it itself is of very special interest. We look for the detail of the interaction with its contexts. Case study is the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances" (Stake 1995; xi).

A case study is a comprehensive, holistic description and analysis of a single entity, experience, or phenomenon (Merriam, 1998). Researchers use the case study methodology when they develop a descriptive and heuristic account of a specific situation or setting (Merriam, 1998). Most research scholars concur that a case study is the exploration of a 'bounded system' (Creswell, 2003; Stake, 2000). The defining feature of a case study is the boundaries that establish the parameters of the unit of study. Thus, case study methods involve the study of an issue explored through a case within a bounded system (Cresswell, 2003). By concentrating on a single entity (the case), I aim to uncover the interaction of significant factors characteristic of a phenomenon (Merriam, 1998). In this single case study, six fifth grade students serve as one entity, the single case, and active gaming experiences serve as the phenomenon. Therefore, I designed this study as a phenomenological case study.

A common focus in phenomenology is on exploring how human beings make sense of an experience (Patton, 2002). Phenomenology allows for observation of the phenomenon within the context of its occurrence (Yin, 2003). In this approach, a goal of the researcher is to capture and describe how people experience some phenomenon including "…how they perceive it, describe it, feel about it, judge it, remember it, make sense of it, and talk about it with others" (Patton, 2002, p. 104). Researchers focus on

interpreting a phenomenon in such a way as to develop a worldview. At this point, there is no objective reality from others; only what they know the experience is and means (Patton, 2002). Patton 2002 describes two implications in phenomenology that are often confused in qualitative research. The first is that it is important to understand what people experience and how they interpret the world which is the focus of the inquiry. The second is the methodology involved. Patton (2002) explains the only way for researchers to really know and understand how another person or people experience something is to experience the phenomenon for themselves as directly as possible. In either case, reporting the findings in a language that shows the lived quality and significance of the experience entirely is significant. This study was a phenomenological case study with active gaming serving as the phenomenon to be studied and six fifth grade students' experiences providing perspectives to be observed and analyzed through multiple forms of data collection. This case study employed a general phenomenological perspective in order to illuminate the importance of using methods that capture students' experiences of active gaming without conducting a phenomenological study that focuses on the essence of shared experience (Patton, 2002).

In addition, cases studies are identified as being intrinsic or instrumental. An intrinsic case study focuses on the actual case while an instrumental case study focuses on an issue (phenomenon) that can be illuminated by studying the case (Stake, 1995). I classified this study as an instrumental case study with active gaming serving as the issue and the six fifth grade students' experiences provide the illuminating information.

School Setting

Kadia Elementary school (a pseudonym) served as the data collection site. Kadia Elementary is a school in the southeastern United States with 534 students in grades K-5. Students at Kadia Elementary School participated in physical education class with a certified physical educator 30 minutes twice weekly. I selected Kadia Elementary because it had an active gaming facility. In addition, the physical education teacher agreed to participate in this research project and used active gaming as a part of the planned curriculum. During physical education class, students participated in active gaming activities for 16 visits (twice a week for 30 minutes for 8 weeks).

School Description

Kadia Elementary School opened in the fall of 1959. The founder of the school was born in Werts Center, N.Y. and she taught school in the same county in which the school is now located. The school was named after her because of her dedication to teaching. The school mascot, the wildcat, and the colors of red, white and black, were selected by the student body. Kadia is a Kindergarten through fifth grade elementary school in which 534 students attend and 75 faculty and staff are employed. Approximately 62% of the student population is African American and 26% is Hispanic. Ninety-four percent of students are considered a minority (See Table 1).

ETHNICITY / DEMOGRAPHICS		
2	0.37%	American Indian / Alaskan Native
10	1.87%	Asian / Pacific Islander
331	61.99%	Black (African American), Non Hispanic
136	25.47%	Hispanic
22	4.12%	Multi-Racial
33	6.18%	White (Caucasian), Non Hispanic
534	100.00%	TOTAL

Table 1: Ethnicity and Demographics of Kadia Elementary School – School Year 2007-2008.

Kadia Elementary is a Renaissance School. The local school system defines a Renaissance school as having greater than 90% of students on free or reduced lunch. Kadia Elementary school has 92.32% of students considered economically disadvantaged and 94% of students on free or reduced lunch. Approximately 23% of students are ELL (English Language Learners) and 13% of Kadia students had a disability. There was a Hispanic interpreter available for parents, guardians, and visitors who do not speak or understand the English language.

Kadia elementary is located in a low socioeconomic neighborhood. Yards of many homes are insufficiently landscaped, the grass was in need of trimming, weeding, and watering, and the trees were overtaken by moss. Debris and trash are visible in the yards and the outside many homes needed extensive painting. My conversation with the physical education teacher suggested the neighborhood was not safe. She mentioned that

homes were often vandalized. The school had been broken into twice in the school year. As a result, the administration decided to put up a more durable fence enclosing all of Kadia Elementary for added security.

Kadia's academic standards are a central focus at the elementary school. In fact, the start of second semester is dedicated to the students practicing the FCATs (Florida's Comprehensive Assessment Test). The students are not allowed to attend specialty classes such as art, music, and physical education periodically in order to take the practice FCATs which made it difficult to interview students. Kadia is considered a failing school based on FCAT testing but improvements were made the previous school year of 2007-2008. See the academic report card for the 2007-2008 school year below:

Grade including learning gains	C
Meeting High Standards in Reading	46%
Meeting High Standards in Math	51%
Meeting High Standards in Writing	80%
Meeting High Standards in Science	13%
Making Learning Gains in Reading	57%
Making Learning Gains in Math	67%
Percent of Lowest 25% Making Learning Gains in Math	70%

Table 2: Kadia Elementary School Academic Report Card for 2007-2008 school year

Kadia Elementary has a mandatory uniform policy for all students; however, the policy is not consistently enforced. Many students are not in uniform with school colors, which are red or white for shirts and navy or khaki for pants. The school administration believes the uniform policy promotes school safety, improves discipline, and enhances the learning environment. In addition, the staff at Kadia Elementary believes school uniforms help students experience a greater sense of school identity and belonging. Shoes must be worn and securely fastened to the feet and have a low heel height. In addition, all footwear has to be suitable for outdoor physical education classes. Unsafe shoes such as "skate tennis shoes" were not allowed. Kadia has spirit day on the last school day of each week where students are encouraged to wear the school's spirit shirt with jeans.

Figure 3: Kadia Elementary School

Based on the school setting and test scores, the school system is making a concentrated effort to improve the quality of the school environment. Kadia Elementary was renovated in the summer of 2008. The school is 50 years old and in need of remodeling. All classrooms are painted beige as well as the cafeteria which has made the

decor of the school much brighter and cleaner. All doors are painted a cherry red. The school is all one level and has five wings of classrooms. Two cherry red picnic tables and two trees are located in the grass area between the wings. Unlike the yards in the neighborhood the campus grounds are well groomed. The mascot is a wildcat. At the entrance of the school the wildcat is painted on a poster that says, "Welcome to Kadia, home of the wildcats where we are wild about learning." The school uses a theme of street signs to label the sidewalks that display a positive affirmation including Honesty Street, Respect Street, Self-respect Street, Courtesy Ave., etc. At the end of each sidewalk are two small red wildcat paws. When students are walking down the sidewalk in their class line, they are taught to stop at these two paws and wait for a teacher's instructions to continue moving.

Active Gaming Room Description

The active gaming environment is located in one of Kadia Elementary School's newly remodeled classrooms. The classroom is approximately 900 square feet. The walls are painted beige during the remodeling phase in the summer of 2008 to match the beige cabinets and tile flooring. When the active gaming room was installed, the décor of the room changed. The walls are painted a bright, sunshine yellow and murals were placed along the top portion of the walls as well as on the top row of cabinets. The murals are dark red with images of action figures splashed in black. The school's art teacher painted the name of the school and a picture of the school mascot on one wall as well as character building words (e.g. Discipline, Respect, Attitude) on the other walls throughout the room.

The active gaming room appeared as if students had just stepped into a video game arcade environment. The room contains a variety of activities with screens dispersed throughout the room, and bright colored yellow walls with busy décor. The room is carefully designed to allow necessary space for the games to be played safely. In addition, all cords to the television screens and activities are securely fastened and covered to avoid potential hazards. The game consoles (e.g. PS2, Xbox) are secured inside a locked box. The active gaming room houses 17 activities and 9 stations in which 19 students could be active at one time. The following is a description of the layout of the active gaming room from a perspective of the back wall being the wall directly across from the entrance and exit (Figure 4). When entering the room, there is a wall on the right, a wall on the left, the back wall directly across, and the front wall directly behind

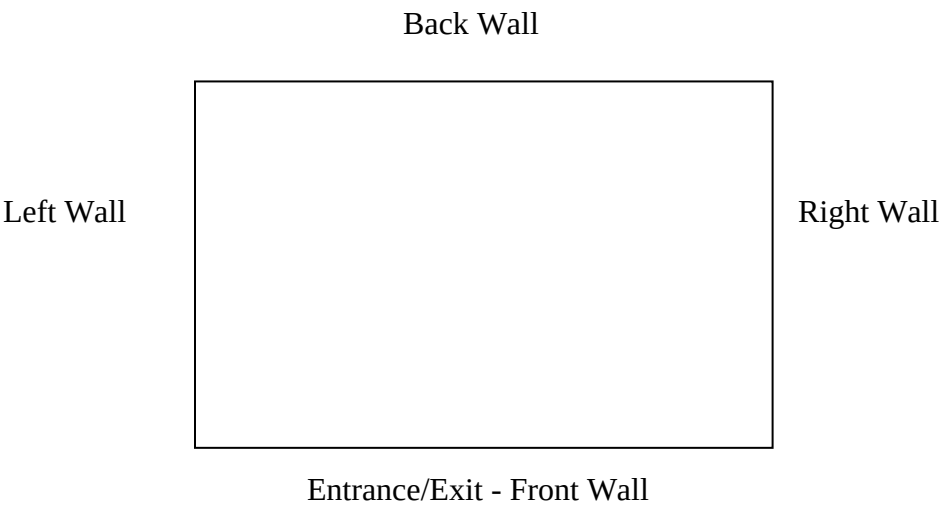


Figure 4: Illustration of Active Gaming Room Layout

Front wall – Entrance/Exit

Figure 5: Active Gaming Room - Front Wall

On the front wall there are two doors to enter and exit the active gaming room. When facing the two doors from the outside, the door on the right is the main entrance to enter and exit. Located on the wall between the two doors is a screen. Above the screen closest to the main entrance is a small shelf containing a lockbox for the Playstation 2 console. Below and in front of each screen are two Cateye Gamebikes. The Gamebikes resemble a traditional recumbent bike with an adjustable seat and pedals; yet, have a steering wheel resembling that of a race car with a video game controller located in the middle. Students control onscreen actions by pedaling and using the steering wheel. The faster the students pedal, the faster the action figure on the screen moves. To the right of the main door entrance on the front wall is a screen with a console lockbox below the screen. There are boxing gloves sitting beside the console as they are required to play this game. The game is called Xavix Boxing and is a game in which students wear gloves each with an electronic sensor in order to virtually participate in boxing matches against a variety of characters.

Right Wall

Figure 6: Active Gaming Room – Right Wall

The right wall houses an activity called GameCycle. The GameCycle is an upper body bike in which the students' arms and hands are used to pedal the bike, not the legs. The students pedal and steer with their arms controlling an onscreen action figure truck trying to pass checkpoints and gather points in the game. The GameCycle is connected to a Game Cube console and a built in screen. Moving further along the right wall, there is a whiteboard that the teacher uses for her physical education lessons to write cues the students could read related to the activity as well as the classroom rules. This whiteboard took up the majority of the remainder of the right wall.

Back Wall

Figure 7: Active Gaming – Back Wall

In the corner between the right wall and back wall is an activity called 3 Kick. 3 Kick is a large, 3 tower durable activity with 3 foam pads on each tower. A light is embedded in the middle of each pad on each tower. When a light illuminates on the pad, the students' try to hit, kick, or punch the pad with the light as quickly as they can. Once they hit the light, it disappears and another light illuminates on another tower and pad. The quicker a light is hit, the more points are scored. There is a kiosk box attached to the bottom of the right side panel of 3 Kick. This kiosk is the control center for the game. Above 3 Kick is an air-conditioning unit built into the wall. To the left of 3 Kick are two large activities called Dog Fight Flight simulators. These machines resemble large arcade games that function similar to a bicycle with a seat and foot pedals; yet, with moveable handlebars on each side of the seat. There is a red fire button on the end of each handlebar and a small trigger controller on top and at the end of the left handlebar. These are the "firing" functions. A large built-in screen is located above the pedals. There

is a control panel under the screen which contains game functioning categories. Students pedal to move their selected aircraft forward and use the handlebars to control the direction in which the aircraft flew. The firing buttons are used to shoot down visual targets throughout the game.

Left Wall

Figure 8: Active Gaming – Left Wall

Next to the dog fight flight simulators are wall beige cabinets. The cabinets are located along the left wall. The video camera used to video tape all sessions and interviews is located in the space between the cabinets and the back wall. On the left wall before the cabinets are two screens. Below each screen is a lock box containing a Nintendo Wii console. Between the screens is a classroom desk where the remote controls are placed before and after game play. Students play virtual sports including boxing, tennis, baseball, golf, and bowling using the remote controls. There are two

remote controllers at each Wii station so students can play a two-player game. In the corner next to the two screens for Nintendo Wii is a small bathroom.

Center Room

Figure 9: Active Gaming Room – Center Room Facing Front Wall

Figure 10: Center Room Facing Back Wall

In the middle of the room is a mobile kiosk called iZone. The iZone has four congruent sides resembling a large tower. On each side of the tower is a mounted screen. There is a small door at the bottom of the iZone on the side closest to the front wall that is used to hold four game consoles and the cords for each. This door closes and locks when needed. In front of the screen above this small door are two Gamercize activities resembling steppers and attached to video game are hand held controllers. Students began stepping to activate the controllers in order to play the video game. If movement stopped, the video game paused. Students are required to continue stepping in order to play the video game. To the right of the Gamercize activities are two Dance Dance Revolution (DDR) electronic pads. Students at this station follow arrows on a screen by stepping in the appropriate direction to score points while dancing to the beat of a chosen song. Located in front of the screen to the right of the DDR pads are two platforms with snowboard simulators called XrBoards. On the XrBoards, students are balancing on a board resembling a snowboard and their movements on the board control the onscreen character's actions. Students virtually race down a mountain performing tricks to earn points and compete to cross the finish line first. On the last side of the iZone, are two more DDR electronic pads.

Participants

I selected six fifth grade elementary school students to participate in the study. I selected the fifth grade level because the active gaming room was located in an elementary school and physical activity levels between the ages of nine and 15 years have been shown to drop dramatically (Nader, Bradley, Houts, McRitchie & O'Brien, 2008). I

selected six students due to the time constraints related to conducting interviews as well as needing to have an equal number of boys and girls.

Prior to data collection, I obtained parental permission forms and consent forms for all participants. The physical education teacher gave the forms to the parents of the students and then collected the forms from each student willing to participate. I assigned a pseudonym to protect the anonymity of all participants. I provide a detailed description of the six fifth grade students and the physical education teacher that included but was not limited to gender makeup, the physical education teacher's teaching style and strategies, and the students' general attitude toward physical education in the section below.

The physical educator selected a class in which the music teacher and the reading and language arts teacher were willing to provide assistance with the study. The music teacher provided time during class for me to interview students, and the reading and language arts teacher provided time during class for students to complete journal entries for the study. I purposefully selected the six students from this class. "The purpose of purposeful sampling is to select information-rich cases whose study will illuminate the questions under study" (Patton, 2002, p. 46). I looked for three criteria as I purposefully selected the six participants: 1) Students who were willing to carry on quality conversations during interviews; 2) Students who provided quality information while journaling, and 3) Gender makeup – three boys and three girls. I discussed with the physical education teacher and the reading and language arts teacher the importance of selecting students that would provide sufficient, quality information during interviews and with the journal entries. In addition, before the study began I spent 4 classes with the

students during journaling sessions and during traditional physical education. During this time I initiated conversations with students in order to learn which students may be more willing to work effectively with me during the study.

Leslie, the physical education teacher served as a key informant during the study. I interviewed her three times and also asked her to discuss in journal entries her perceptions on the students' experiences in active gaming. I used this information to support and provide triangulation to the resulting themes that emerged from this study.

Description of Participants

*Joey***.** Joey is a light skinned African American boy. He has course, black, closely trimmed hair. Joey's eyes are dark brown and when he smiled his teeth appeared straight and a dull white color. Joey is noticeably overweight and his face is round with chubby cheeks. Joey often wears baggy jeans, t-shirts, and usually a black zip up jacket which is not the recommended school uniform. Joey may realize he is more overweight than other students because he made several comments about being the "fat boy" in general conversations with his peers. Joey appears to be a happy student who rarely complains and smiles often. Joey enjoys assisting his teachers at Kadia Elementary School and when having general conversations with these teachers, they consider Joey a nice kid and good student. Joey's physical education teacher is concerned about his weight but believes he is a friendly and happy student and has a chance to continue enjoying physical activity in the future. The following is a passage from an interview with the physical education teacher concerning Joey's enjoyment in exercise:

> "…just because of his size, that I would really like to look into; though he likes PE, he always wants to help me, he goes out and he

> tries 100% and he's always sweating buckets out there. He really tries and everything like that. But, I'm concerned about him just because of his weight. So, that he is this excited about it (active gaming) that he's going around and talking to people and his teacher is excellent. Hopefully this is gonna hook him into something. He's a big guy. Maybe football. Something, that he's gonna say 'I really like exercise, I really want to do something where I'm going to be involved.' He's such a nice kid, he really is."

Joey is not a shy student and is extremely verbal while playing many of the games whether he is s talking to himself or a peer. The following are short passages from fieldnotes taken while Joey is participating in active gaming:

> Joey is in between them (his partners) watching close and making comments on the game. Joey has a red face and is perspiring already from having been on the bikes. Joey says, "I want to play Harris, I want to play Harris. Restart it…ohhh….no don't restart it." Then he tells Harris to get off the equipment so they can restart it.
>
> Joey is watching Wilson on DDR and got real excited for him by saying, "Wilson, Wilsonnnnn" smiling so big and laughing as he watched Wilson on a level too hard for both players. Shortly after the screen says 'Failed' and the two boys look at each other and start laughing.
>
> Joey is back on boxing and says, "Oh my god, Oh my god – I'm so tired and my ribs are hurting." I asked, "why are your ribs hurting" and he said, "cause all the punching I have been doing. It's so fun, I would do this at home." Joey's face is red and dripping with sweat.

Joey is animated student often smiling, laughing, or showing a focused look on his face while playing the games. Joey tends to be an aggressor when it comes to choosing which activities he and his partners play and is often the first to be participate in activity in his group. He is aggressive and does not want to wait to play a game; however, he works well in groups and is respectful to his peers by sharing and taking turns on the activities. When Joey is not active, he is on task and involved in his peers'

game play. In addition, Joey is a very good student as he listens to instructions and always completes assignments for the lessons in physical education class whether it be individually or assisting his group.

Although Joey enjoys traditional physical education classes, he believes physical education class is better since active gaming has been implemented:

> For me this room is just amazing. Dogfight, three kick those games I didn't know existed and so I found out what it all is. and its just awesome, everything. And we are like the only class that can do this for now.
>
> I would have these in every single school, because the games they have here, the game room; it would get kids to have more fun. Like for PE, it would be fun too. But this one you just get their little minds going and just have fun.

The following is a passage from fieldnotes that demonstrates Joey's excitement regarding active gaming and his desire to share with his peers and teachers:

> I walked out with Joey and Wilson and I heard Joey say, "I love this room." Then he saw his teacher and said, "Mrs. Cross, I LOVE (drawn out) this room. I wish I had one in my house, especially DDR." Mrs. Cross said "what is that?" He said, "The game where you have to step to these arrows on the screen to music." She said, "Great". Joey turned to Wilson and said, "I'm gonna beat you next time." Wilson just grinned.

The following interview response from Leslie summarizes Joey's personality regarding physical activity and his enjoyment participating in active gaming:

> …Joey who is a big guy, still loves PE and he always did everything I said. I mean he'd be sweating bullets out there, but he would do everything. And which I hope he keeps up because I'm worried about him. You know, I don't want him to get any bigger than he is, I hope he gets into football or something like that because he's a big guy. But

> I mean he went crazy in here, I mean he is going every second in here. Because he had the chance to be the one who would do it, the one who could be in control of his own destiny kind of thing. Sometime when you're out and in a game you don't really have that much control. And you really say how motivated he is. He is really doing something all the time in here, and when he isn't he is dying to get on something.

Angela. Angela is a tall, Hispanic girl who is noticeably overweight. She has long, wavy, dark hair and wears glasses. Angela dresses conservatively and in my opinion she appears to want to hide her weight by wearing layers of clothing or a light jacket. She is quiet and avoids confrontations. Angela is a great student because she remains on task and is concerned about completing worksheets correctly during class. She is considered academic by her teachers as she always turns in assignments on time and with great quality. Angela is capable of articulating her thoughts intelligently using complete, well developed sentences. The following are examples of responses to journal entries:

> I like it (active gaming), it's so fun. I mean, still being fit while playing games and having fun too.

> There is really nothing wrong (with active gaming) so I guess I'll just compliment it. I just think they (active games) are awesome and I'm still being active.

> I love DDR because I like the dancing. I think it's fun to dance. I like 3 kick because I like having to think where the next light will pop up. Also, it's just fun.

When it comes to being active, Leslie suggests Angela is typically lazy or less aggressive although always on task. However, while participating in active gaming, she was much more outgoing as documented in an interview with Leslie:

> …Angelic who might normally be very laid back and not be very motivated, she'd actually seemed excited and that is a change, I think,

> for her. She comes and does what she's supposed to do just because she's a well behaved girl. But you don't normally see, she's a laid back kid, you don't normally see a lot of excitement. But I could tell, even if she is like (making loud screeching noise) that she is about what is going on. So that is nice to see… And I think it is a good thing that Angelic is one of the kids that we had. Because there's your typical overweight kid. Highly academic, not into PE at all, and yet we saw a big change in here.

Angela is not an animated student around her teachers or her peers; yet, enjoyed playing with her peers during active gaming. She usually had a serious or straight look on her face but would often smile or giggle when playing with her peers.

> Angela is on DDR watching the screen intently. Her eyes are focused on the screen and her mouth is open with her tongue changing positions in her mouth as she continues to step. Every once in awhile she will smile but quickly go back to a serious look.
>
> The girls (Ashlyn and Angela) are focused still playing DDR. Ashlyn, "Ohh gosh" on a double jump – she had a big smile on her face. Angela, "Gosh" when missing an arrow. At the end of the game Angela is sweating with a red face. Ashlyn gave her a high five and both are smiling. Ashlyn said, "Same score again." Angela smiled.
>
> Angela is on 3Kick with two others playing one at a time, but they will help each other out if a light comes on near one of them waiting to play. Angela is near a tower when a light comes on and she tries to hit the light before the peer gets to it. The girls start laughing when this happens. She tried to play in front of another peer and the peer said, "It's my turn" and Angela smiled and took a step back and let her play first.

Harris. Harris is a tall, large in stature, dark complexioned African American boy. He stood well above the rest of his peers. His head is closely shaved to the scalp leaving on a small appearance of hair on his head. He has dark brown eyes and a bright white smile. He is a larger boy that may have a challenging weight issue in the future if not attended too. Harris often wore baggy jeans with a red polo shirt. Although not the

suggested attire for the school uniform, the red shirt is aligned with the policy. Harris is quiet and shy with adults; however, he is animated and talkative with his peers when playing the games or waiting to play. He is a competitive student. The following passage demonstrates a conversation between Harris and a peer when playing an activity:

> Harris is on the XrBoards. Peer says, "So, we tied?" and Harris says, "How dare you. Oh, now we tied, how about that." Peer says, "No" as he smiles. The game finishes and they compare scores pointing at the screen. "I got you" Harris said, smiling and pointing at the score. Peer just shakes his head and smiles.

The physical education teacher stated that Harris is a "good student and really good kid". Harris is also a calm student when it comes to discipline and responds appropriately to demands from Leslie even if he does not agree with them:

> Herbert is sitting quietly watching Leslie...Leslie looks at Herbert and says, "Get your hand off of him (the student beside him) or get out. I mean it. I am not dealing with this." Herbert had a look of amazement as his hand is actually on the heel of his own shoe. He sunk down in posture, crossed his legs, propped his elbow on one knee and rested his head in his hand, still listening with his eyes on Leslie.

Harris gets excited about playing the games as he is frequently seen hurrying to jump on an activity when rotating stations. Harris is often focused on the screen with a more serious expression; yet, he often smiles and laughs with his peers as he is playing the games. Harris is aggressive and ambitious when being physically active. He pedals fast on the Cateye Gamebikes and Dog Fighter Fight simulators as well as punches hard at Xavix boxing, stomps heavy on DDR, and steps rapidly on Gamercize. He seems to enjoy being physically active because he enjoys playing sports. The following is an

interview conversation I had with Herbert about the relationship of active games to sports:

> Harris: I like the boxing, um... what's it called?
>
> Researcher: Three kick.
>
> Harris: And, the baseball game.
>
> Researcher: Why do you like those activities?
>
> Harris: Because they're sports, and I like sports.

Harris enjoys traditional physical education but is excited to have the active gaming room at his school. The following is an interview conversation I had with Herbert about active gaming in physical education:

> Researcher: Before this past week, when you were not able to come in here (active gaming room) for PE, how did you feel about your physical education class?
>
> Harris: It is good but it's better now that we have this.
>
> Researcher: Let's pretend you are the P.E. teacher. How would you use active gaming in your classes throughout the year?
>
> Harris: To be honest, I'd probably want to get on it with them.
>
> Researcher: We talked about exercise earlier, how do you feel about active gaming being a source of exercise, or type of exercise?
>
> Harris: I feel that it has made PE better than what it was before.

Ashlyn. Ashlyn is a short, petite Caucasian girl with long, thick brown straight hair that she often wore in a ponytail. Ashlyn dresses according to the school uniform policy, yet also wears a zip up, light blue jacket. She has large, brown eyes and tan skin. Ashlyn is considered a great student by her teachers. She is always on task and polite. Ashlyn is serious about her behavior and focuses on getting along well with her teachers

and peers. In addition, Ashlyn takes the FCAT testing serious and desires to do well in school. The following interview responses demonstrate Ashlyn's focus on academics and getting along with her peers and teachers after I asked her how she felt about active gaming and exercise during physical education class:

> I was feeling that I was really getting along well with my teacher and other students.
>
> I feel so excited, and that my group gets along very well. And we take turns doing all the equipment.
>
> Uhm. Like, if they don't wanna do that one, I would say would you mind switching, because I want it to be fair for other students. Yeah. And and like if they don't want to do Dance Dance Revolution, and I'm like 'oh well, would you mind going to the (clear throat) Dance Dance Revolution,' because I want it to be fair. And they'd say 'Yeah yeah I'd love to,' and it'd be good.
>
> No (I would not spend time at home playing active games), because it is taking away from my learning time and I want to get up my score on my FCATs.

Ashlyn enjoys physical education class and exercise in general. The following are interview responses from Leslie regarding Ashlyn's enjoyment for physical education class:

> Ashlyn is usually just very happy and motivated at PE things anyways, she's very athletic. So, um, they all seemed to really be into it.
>
> Ashlyn is very athletic. Ashlyn will probably be involved in sports, she's a natural.

Although Ashlyn is considered a quiet girl by her teachers, while participating in active gaming with her peers she is often verbal. She would illustrate excitement in her words and various expressions. The following fieldnotes illustrate Ashlyn's animated interactions with peers and enjoyment while participating in active gaming:

> Ashlyn is playing baseball on the Wii with Tonya. She is watching the screen close and says, "yeah….no….yeah" not sure if the ball she hit is a foul or a homerun at first. Tonya missed the ball again and threw both hands up in the air and back down and watches the screen to swing again. Tonya said, "I have hit a homerun" (in response to Ashlyn telling her she just hit a homerun) and Ashlyn said, "You didn't hit a homerun." And Tonya said, "the first time I did." Ashlyn threw a strike and said, "You're out, yeah."
>
> Ashlyn is now on DDR with a peer talking "I feel weird" giggling. The other student started laughing and said, "What am I doing" as she is missing the steps and getting "boos" on the screen. Ashlyn died laughing and the peer said while laughing, "Shut up". Ashlyn kept laughing very hard and then the boys behind them waiting started making comments about Ashlyn on DDR missing some of the steps. Ashlyn kept laughing (the boys are laughing) and she turned around and said, "Stop" then turned back around and said giggling, "Where am I stepping". The boys behind her are giggling and smiling.
>
> Ashlyn just finished a game on 3 kick by herself and she looked at her score and squealed a high pitched, "yeahhhh". She went straight to the paper on the wall and wrote her name as part of the 100pt club with 107 points. Her peer started playing and Ashlyn turned around to the board and traced her name and points with her finger. She appears to be proud of herself.

Wilson. Wilson is a petite, light skinned Hispanic boy. He stands at average height with his peers, approximately 4'8 feet tall. Wilson is always well groomed in a collared shirt and khaki pants both well ironed. He is always in school uniform. Wilson is a well mannered student and speaks politely about his teachers and peers. He would look me in the eyes during conversations and respectfully discuss his appreciation for having the active gaming room at his school. The following is an interview response from Wilson when I asked if he had anything else he would like to say about active gaming:

> I wanna, I wanna say that every single school should have these because every single students like sports and activities but they don't think that games is some exercise. I want like every single school should have these so every single student can have fun.

Wilson is quiet around his peers and teachers and is not animated when involved in game play. He smiles while he plays, and when others are playing the games, he is watching and occasionally making a comment:

> Wilson is watching Harris and Joey closely and very engaged in their competition. Joey finally caught a rail and Wilson said, "oooohhhh, you got it."
>
> Wilson seemed excited to play DDR with Joey. Wilson had a huge smile on his face. He looked at me and said "I love this game." Joey is looking at me and agreed by saying, "Me too, I love this game." Wilson said smiling, "I put it on expert (mode), and I am gonna be like, er er er (making funny noises)" as he is showing me how he is going to be moving his feet really fast to catch up.
>
> Joey and Wilson are back on DDR. Wilson keeps a smile on his face the entire time…They finish the song and quickly get off and wait one turn to play again. They start bouncing up and down waiting for the arrows to move up the screen. The lights go out to quit in the middle of the song and they keep stepping. They wait until all others are sitting before they get off. Wilson is smiling the entire time he is dancing to the song.

The following is an interview response from Leslie discussing Wilson's demeanor:

> "I (Leslie) recall Willy being very excited, and Willy isa lso a very laid back guy. He just seemed very excited to me, from his normal demeanor. He is a normally calm guy, smiles a lot, he is very pleasant-mannered kid. But he doesn't normally include a lot of excitement, but I did see that from him with active gaming.

Although Wilson is quiet, he is competitive when playing with his peers. Wilson enjoys challenging other peers when participating in active gaming. The following fieldnotes demonstrate Wilson's competitive attitude:

> Joey and Wilson are still on Dogfighters and all of a sudden Wilson found Joey and shot him down. Wilson looked up at me and said, "I got him." He seemed so proud! Joey said, "I'm gonna hurt him now" and Wilson said, "Sure you are" and is grinning ear to ear.

> Wilson and another girl are challenging one another on DDR. This is the girl that Wilson told me had beat him before…They are waiting behind the pad singing to "Get Busy" and practice stepping. Wilson and his peer are now on light mode and play the same song ("Get Busy"). She received a score of a C and he received a D. Wilson just smiled and said, "Ok, 2 to 1. I will beat you next time."
>
> Wilson just finished a game on DDR against his peer and won. He looked at me and said, "I have 2 points and she got 2 points." As he pointed at the girl smiling big.
>
> Wilson is back on against his peer and playing on Standard mode. They both are not doing great. The lights go off to finish up for the day and they finish their song. Looking at the score he says to her, "Yeah, I won." She said, "No we both got an E". Wilson said, "No, look at the actual score, right here" as he is pointing to the number score. She said, "Oh, ok". Wilsons said with a huge grin and sense of accomplishment, "Yeah, 3 to 2, I won". She said, "I'll get you Monday" and they both sat down quietly.

*Tonya.*Tonya is an African American girl approximately 4'6 inches tall. She has thick, dark black hair that lies directly below her shoulders. Tonya changes her hair style frequently and is always well groomed in appearance, including well dressed. She often wears clothes not aligned with the school dress code. Her attire is stylish as she wears designer jeans from "Baby Phat" and cute button up collared tops with shoes that resembled that of a dancer. Tonya is passive, patient, and non confrontational. She follows her peers when participating in small groups agreeing to play the games her partners choose. Although Tonya is not outgoing, she remains on task and does what she is asked during instruction. She tends to not attract attention because she is quiet and does not misbehave. Leslie suggested Tonya is "very quiet, participates does everything, but very quiet. And tends to not attract my attention just because she's always doing what she's supposed to be doing, very quiet, doesn't cause a problem."

Tonya is not emotional verbally or nonverbally. However, when participating in active gaming she is often seen with a big smile on her face. Tonya is intense when playing the active games (stomps hard on DDR and hits with more force on 3 Kick) but never loses a smile from her face. Tonya enjoys physical education especially now that she is participating in enjoy active gaming:

> I feel like whenever I go in there it like I just meet new physical games and I don't know why maybe I feel great, awesome, abnormal, about this but I no (know) I don't feel normal like I have done this already.
>
> Well I really enjoy everything I mean every things great good awesome and I like the way they make it for you to have fun and still physical but I loved everything.

The physical education teacher noticed Tonya's enjoyment with active gaming and made comments about it during interviews saying:

> And Tammy is also a quiet kinda girl, but she is just smiling, and you could tell she is enjoying it.
>
> Well they all loved it, there is no question, they enjoyed it, all of them. The two that I noticed the most change would be Tammy and Angela. Tammy, again, because I don't really know her that well, but I saw a lot more of her personality, a lot more smiling, a lot more, which maybe she did before and I didn't notice…
>
> I think Tammy and Ashlyn love it. It's just that they're more reserved in their whole demeanor about it. But they're smiling, and you can really tell they're enjoying it. The point isjust that they're kinda "ahh ahh!" (high pitched excited yell).

Leslie. Leslie is the physical education teacher at Kadia Elementary School. She hold an undergraduate degree in Physical Education and a master's degree in Adapted Physical Education. Leslie has taught physical education for 23 years in both elementary and middle school settings. This is Leslie's second year at Kadia Elementary. Leslie is a white, middle-aged woman approximately 5'4 tall. She has dark, tan skin and her hair is

black with natural grey. Although Leslie comes to class each day in gym shorts and a T-shirt that is not tucked into her shorts, she appears clean and well groomed. Leslie mentioned she is a "very organized individual who tends to be anal and in control of classes." When I was organizing my inquiry, Leslie, without delay, responded to emails, distributed and retrieved necessary documents on time, and relayed necessary conversations from teachers and administrators. Leslie is a confident woman serious about teaching physical education.

Leslie suggests her main focus at Kadia Elementary is behavior and discipline control. She believes if students are "on task and active the class is successful". She has a one warning rule where she warns a student of misbehavior in her class and the second offense leads to the student being sent out of class. Due to Leslie's focus on discipline, learning objectives in her lessons are not the main priority in physical education class. She mentions that her typical lessons are "nothing like the lessons the local University's interns are required to plan or the lessons you (researcher) have prepared with the active gaming unit. She believes students at Kadia Elementary benefit more from being active, learning how to behave, and staying on task, rather than focusing on various learning objectives and a progression of skill development. The following journal entries demonstrate Leslie's focus on staying on task and being busy:

> Today the students continued moving around the room freely. They did an excellent job of having only one person waiting their turns at the stations. The students were all keeping busy and they looked excited as they waited for their turn. All the research students looked busy when I observed them and I did not notice any behavior problems at all…In general, the students remained active and well behaved for the duration of the class.

> This was the last week for the research study. The students were allowed to go to whatever stations they wanted again. The students did very well with this on Monday. To my knowledge, the research students were not involved in any misbehavior and they remained on task during class. Whenever I observed them, they appeared to be enjoying themselves and keeping active.

Although Leslie seems strict and unemotional in her discussions about discipline control, she is often seen smiling and laughing with the students and even hugging them when they accomplish or achieve something they feel is important and worth sharing. She is responsive to her students with both behavior issues and successful, positive experiences as demonstrated in the following excerpt from fieldnotes:

> Wilson had been on the bike pedaling with Joey and then with Harris. Wilson got off and said to Leslie, "Wow, feel my heart" (smiling and holding his hand to his chest). Leslie put her hand on his chest and said with a big grin on her face, "Ooooh, yeah, really beating fast." Wilson smiled with his hand on his chest and went back to watch his group on the bikes.

Planned Lessons and Pedagogy

I developed the lesson plans for this study because the physical education teacher, Leslie, did not have the knowledge of how to implement active gaming in physical education. I consulted with and expert advisor to make sure the lessons I was developing were appropriate. I discussed the lesson plans with Leslie to make sure she felt comfortable implementing the lessons with her students. I created the lesson plans based on the students participating in an eight week fitness unit. The lessons focused on what the students should be learning first (components related to fitness), and then used the active gaming room as a tool to accomplish the desired objectives. The active gaming lessons were based on Florida State and National standards.

In a quality physical education classroom, lessons should have objectives based on National or State standards. In addition, each lesson should include at least one learning objective. Students should be made aware of the learning objective, provided with appropriate activities to practice the learning component, and then assessed in order to understand if they have successful accomplished the learning component. In a conversation I had with Leslie, she mentioned her traditional physical education classes focused primarily on behavior, discipline, and activity time. She did not focus on learning outcomes. Leslie stated that the population of students at Kadia Elementary "were not disciplined at home appropriately and therefore, did not behave at school." Therefore, she believed the students would benefit more from a strict, discipline focused environment that fostered activity time over skill development or other learning objectives. Leslie did mention her lesson objectives were intended to meet Florida State standards; however, the learning objectives were not discussed or related to the students before class began or discussed at the conclusion of class. Accordingly, Leslie did not implement the active gaming lessons with the students' learning the objectives as the focus. Leslie's priority continued to be behavior and getting the students up and moving as quickly and as long as possible. The active gaming lessons are discussed in Chapter 4 and can be found in Appendix G.

Data Collection

Data collection involves the attainment of information needed to answer research questions. I collected data for this study based on a qualitative case study approach (Stake, 1995; Yin, 2003). In qualitative research, it is important to provide enough data for validation of data to occur (Cresswell, 1998). Validation or justification refers to the

strength of qualitative research made possible by the extensive time spent in the field, the detailed descriptions produced by the data, and the closeness to the participants during data collection (Cresswell, 1998). I justify the data through triangulation, or the use of multiple methods and sources of data collection to verify the consistency of the final report. Triangulation builds a consistent justification for the themes that will evolve during data analysis (Creswell, 2003). My inquiry achieved triangulation through the examination of evidence through interviews, field notes, and journal entries across multiple participants.

The Role of the Researcher

Patton (2002) defines participant observation as a continuum that varies from being completely immersed in a setting as a full participant to only being a spectator. My role as the researcher in this study was in the middle of the continuum serving as an observer and a participant observer. I did not participate in the active games; yet, I observed and talked with the participants about what was happening while they were experiencing active gaming in physical education classes. Additionally, I was involved in developing the active gaming lesson plans and assisted with technological difficulties with the active games during the study.

I provided a manual to the physical educator that explained how to use the active gaming equipment, and provided ways to use the equipment including ways for students to rotate in the active gaming room, a variety of challenges, and suggestions for assessing the students (Oh, A., 2007). I developed the active gaming lesson plans and worked with the physical educator to develop appropriate lesson plans to use during this study. The lesson plans include structured (i.e. stations or fixed rotations), unstructured (i.e. open

play or student's choice), and semi-structured (i.e. activity cards or scavenger hunt) rotations. Each type of rotation was implemented before the 4th week of the study and again before the conclusion of the study in order to learn if the way students move around the active gaming room influenced their experiences during active gaming participation.

I provided training for the physical education teacher to learn about the active games, including how they function, possible options for game play, and instructional strategies that may be used. During the training, I explained and demonstrated each activity in the active gaming room. This training was videotaped as well as observed by a colleague in order to provide verification of activities that occurred.

Interviews

Student Interviews

Interviews serve as one of the most important data sources in case studies (Yin 2003). I conducted interviews with the six students. Although I was pursuing a consistent line of inquiry, the questions I posed to the students were fluid rather than rigid (Rubin & Rubin, 1995). In order to provide a convenient and comfortable time and place for the participants' interviews (Maykut & Morehouse, 1994), I rotated students out of their music class (as arranged with the music teacher), and taken to the active gaming room for interviews. The students have music class two times each week for 30 minutes. After the initial interview with three students I decided interviewing them in pairs would provide me with more quality data. The remaining interviews were conducted with the students in pairs.

I interviewed the students three times during the study - during week one, week four, and week eight. I recorded the interviews using a Sony ICD-8500 voice recording device. I asked the students 10-12 open-ended questions (Appendix A) with each interview lasting approximately 15 minutes. The information I learned from recording fieldnotes and reviewing the video tapes influenced the development of future interview questions that were asked. I consulted with and expert advisor to make sure the interview questions I had developed were appropriate and effective in reaching the goal of answering my research questions (Appendix H). All student interviews were immediately transcribed into a Word Document format that was used during data analysis.

Teacher Interviews

In addition to student interviews, I conducted interviews with the physical education teacher. Interviews with Leslie provided insight supporting the six students' experiences while participating in active gaming during the physical education classes. I conducted three interviews with the physical educator - during week one, week four, and week eight. I recorded all interviews with the physical education teacher using a Sony ICD-8500 voice recording device. Each interview was approximately 35 minutes in length and was guided by 15 open-ended questions (Appendix B). I transcribed all interviews with the physical education teacher into a Word Document format that was used during data analysis.

Fieldnotes

The six fifth grade students participated in active gaming during physical education class twice a week for 8 weeks. During each session I observed the students

and recorded fieldnotes, a written log of the events being observed (Stake, 1995). The first day of each week I observed the six students during active gaming in the general environment. I used a spiral bound journal to collect this data. During the second session of each week I collected detailed, in-depth fieldnotes on a specific recording form (Appendix E) in order to explain what was happening with each participant's experience during active gaming in the physical education classes. I recorded any informal interview sessions I had with the students during the active gaming sessions in the fieldnotes. Furthermore, I recorded personal impressions and thoughts related to what the students were experiencing during exergame play.

In addition to taking fieldnotes on the students' experiences, a graduate student assisted me with fieldnote data collection. The graduate student used a recording form (Appendix F) to document what the students were doing at various times during the active gaming session. I provided a pseudonym for each of the six students to use for identification. Every minute the graduate student rotated observation to a different participant and recorded the activity in which the student was participating as well as other thoughts and/or expressions that occurred during that time frame. All six students were equally observed; therefore, the graduate student used a rotation where the participants each had an equal opportunity to be the first and last observation. The data collected was immediately transferred in a word document with my observation fieldnotes. This data did not provide significant discoveries; however, this data did provide support to the fieldnotes recorded.

In addition to recording fieldnotes, I recorded each session using a video camera. The video camera assisted me in several ways: (1) I was able to review the information

recorded on tapes during class to validate the fieldnotes; (2) I was able to review the session that was recorded with the ability to capture any information pertinent to the study that may have been missed at the time when collecting the fieldnotes; and (3) I generated interview questions based on the information I reviewed in the video tapes. The video camera was mounted on a tripod and positioned to the side of the active gaming movement area which enabled the camera to capture a full view of the room. The video camera was turned on before students entered the active gaming room. The students were aware that they would be videotaped each session and consent forms were signed prior to participation in the study. The video camera did not have a significant influence on the reactions of the students.

At the completion of each session, I wrote a summary describing the six fifth grade students' experiences in active gaming. I reviewed the video tape to verify the fieldnotes were accurate and captured other information that was beneficial to the study. At the end of each session, I transferred all fieldnotes from the spiral paper journal to a Word Document so data could be analyzed.

Journal Entries

Journal entries completed by the six fifth grade students served as another data source. Following experiences with active gaming, students discussed those experiences through journal writing assignments. The reading and language arts teacher organized the journal writing assignments as part of the students' reading and language arts class. I provided Leslie with the journal questions on a one page word document for each student to submit their entries. Students were given guiding open-ended questions related to the

purpose of the study. Students submitted journal entries once a week on five out of the eight weeks of the study. Their first entry was before they experienced active gaming. This initial entry required them to discuss their experiences in physical education. The remaining four journal entries were collected at the conclusion of weeks two, four, six, and eight of the study. I collected the students' journal entries after each journaling session and immediately transferred the data into a Word Document Program. Future journal questions were derived from what I learned from the students' discussion about active gaming in their journal entries. Sample open-ended journal questions can be found in Appendix C.

In addition to the students' journal entries, the physical education teacher also submitted a journal. She wrote a journal entry following 10 of the active gaming session. Guiding questions for the entries can be found in Appendix D.

A more experienced colleague assisted in the review of both interview and journal question development. This process assured the questions were appropriate in order to provide the best information to answer the research questions in the study.

Data Analysis

"Data analysis in qualitative research consists of preparing and organizing the data for analysis, then reducing the data into themes through a process of coding and condensing the codes, and finally representing the data in figures, tables, or a discussion" (Cresswell 2007, p. 148). To prepare and manage data collected, following each interview session I transcribed them using a word processing program on the computer. Also, data from journal entries and field notes were transferred to a word processing

program. All documents were stored in a secure file on the computer and on a backup storage drive.

Following the organization of data, I continued analysis by getting a sense of the entire database. By reading the transcripts in their entirety several times for each fieldnote, interview, or journal transcription I was able to get a sense of the data as a whole before breaking it into parts (Agar, 1980). Next, I wrote short memos (e.g., short phrases, ideas, or key concepts) in the margins of the transcripts.

Using an inductive analysis approach which involves the discovering of patterns, themes, and categories in one's data (Patton, 2002), I reflected on the larger thoughts that were presented in the data and formed initial categories. Then, I looked at multiple forms of evidence to support each category (Cresswell, 2007). I did not use all the data I collected. I discarded the data that did not provide sufficient support to a category that was used. This lead to the list of tentative codes I developed that then evolved into themes. As I reviewed and re-reviewed the database, the number of categories were reduced and organized into themes (Cresswell, 2007). The themes were used to write a descriptive narrative in which I presented an in-depth picture of the case and it's setting using a descriptive narrative approach.

Summary

The purpose of my research was to explore the experiences of six fifth grade students' as they participated in active gaming during physical education classes. In my inquiry I also explored the experiences of three boys and three girls as they participated in active gaming.

Chapter 4

Descriptions of Student's Active Gaming Experiences

The purpose of this inquiry was to explore the experiences of six fifth grade students as they participated in active gaming during physical education classes. In my inquiry I also explored the experiences of three boys and three girls as they participated in active gaming. This chapter will focus on describing the six students' experiences while participating in active gaming during physical education classes. The six students in this study were Joey, Harris, Wilson, Angela, Ashlyn, and Tonya. Their physical education teacher was Leslie. These are pseudonyms used to protect their anonymity. In addition, this chapter discusses the students' prior knowledge regarding exercise, the active gaming lesson plans and how the students experienced this curriculum.

Knowledgeable Students

Prior to the students participating in active gaming, I explored how the students felt about their physical education class, what they had already learned about exercise, and how they felt about exercise. The students reported enjoying their physical education class. Harris said, "My feelings for physical education class are deep. School would be a pretty boring place if physical education wasn't involved," and Joey mentioned, "Physical Education outside was like fun. She (Leslie) gives us footballs and you pair up,

and you just throw it, have fun, talk to your friends, and just have a good time." Other students commented by saying,

> "Yeah I enjoy very much b/c you're with you're friends. You play with your friends." (Wilson)
>
> I think P.E. is good the way it is. We practice throwing and other stuff to and its fun. (Angela)

When discussing the word 'exercise', the six students had a basic understanding of what exercise meant. The students believed exercise was "good for the body" and "important to include in a healthy lifestyle." Harris believed exercise was important by stating, "Exercise means a lot to me not only does it help my body it is a way of life." Joey also felt exercise was good for him by saying, "Exercise means to me like if it's helping me and my body getting more healthy and feeling great about myself." The other students agreed by reporting:

> It's fun and get's your heart rate up, and it gives you excitement it makes you breathe harder. (Wilson)
>
> It means to do things or activities that keep you fit. (Angela)
>
> It means to get my body moving like not to just sit at home all day at lease go outside. (Tonya)
>
> Exercise means to me that it will give me a good heart rate and stronger abs (abdominals). (Ashlyn)

It was clear before the students started participating in active gaming that they not only understood exercise, but they related it to participating in physical education. As Ashlyn stated, "My feelings for P.E. are excitement because I like working out. I also like to gain more protein. But not just on protein bars but on P.E. In addition, Tonya

explained, “Well my feelings about P.E. are that when I exercise it gives me this feeling that my body’s getting stronger.”

The students clearly connected active gaming to an enjoyable form of exercise. Ashlyn commented, “I feel really good. This is a wonderful opportunity to play games at the same time you are working out. I feel all worked out because these games give you all types of exercises.” Angela defined active gaming simply being fun, however, she was happy to know she was also being active. Angela said, “Active gaming is when you play games that are fun, but still your being active and staying fit…There is really nothing wrong (with active gaming) so I guess I’ll just compliment it. I just think they (the games) are awesome and I’m still being active.” The other students agreed:

> Sometimes our PE (pause), some people think it’s boring. And when they play games when they’re exercising they think it’s fun. So that’s why active gaming is here. (Wilson)
>
> I think it’s awesome, because you’re playing games and you’re having fun, but you’re still doing physical work (Tonya).
>
> I feel excited on Mondays’ and Tuesday’s when we go to the games room. But I also feel exhausted when we leave the game room (Harris).
>
> I really, really love it. I get energy and I also get active with the machines. It is the best that happened to this school (Joey).
>
> Ashlyn - Active gaming is a game that is an exercise, but you really don’t know that it is exercize (exercise). It feels great because we got to exercise and play video games at the same time. It’s great because people love playing video games. Also people love being strong too.

Leslie supported the concept that exercise should be fun and active gaming was another tool to provide students the concept that exercising can be an enjoyable process.

> "Well, exercise can be fun and doesn't have to be some horrible grueling thing and it doesn't have to be jumping jacks. This is just another tool to get them excited about exercising, especially the ones that's not their thing. 'Well you know this is kinda fun, but it's not so bad, I got sweaty but I really felt good after this,' and say afterwards 'well maybe I should make this more a part of my life,' it's a wonderful thing to add to the program that is already here. To expand their horizons to that exercise can be fun."

The Students' Daily Experiences in the Active Gaming Room

This section describes the students' general experiences while participating in active gaming. Sections that follow will provide detailed descriptions of the students' experiencing the active gaming sessions including their experiences with the implemented lesson plans and social interactions with peers.

The students participating in the study were scheduled to come to physical education on Monday and Tuesday afternoons from 1:45 to 2:15. This was the last class period of the day. The students had class with their homeroom teacher prior to coming to physical education. Their homeroom teacher had a policy in which the students would not leave for physical education class until all students were quiet and on task. As a result, the class was consistently 4-6 minutes late to physical education class each day. As soon as the students arrived, Leslie was at the door waiting for them. The students would leave their book bags outside by the door to the active gaming room to prevent any safety hazards. The students walked in quietly and sat down in front of the 3 Kick facing the middle of the room waiting for instructions by Leslie.

Each lesson plan included an introduction to assist Leslie in implementing the daily instructions. Leslie would spend a brief 2-4 minutes discussing the lesson for the

day, occasionally mentioning or revisiting the previous lesson if applicable. In addition, Leslie would always remind the students of various management issues such as remembering to rotate when asked, sharing equipment, finishing their worksheets, and respecting one another. After this brief introduction, the students would be released to begin playing the active games according to the lesson. In some cases, partners were selected by the teacher. In other instances, the students were allowed to choose their partners. In both situations, the students were up and moving in the active gaming room quickly.

Students would then be considered "on their own" as they would follow the instructions from the daily lesson. Some lessons required the students to rotate when asked by Leslie. If this was the case, Leslie would turn the lights off, say "rotate" loudly, and then proceed to turn the lights back on. The students would then know they were to rotate to the next activity. If the students were not asked to rotate at a designated time period, they would complete activities on a worksheet and move around the room accordingly or they experienced "free play" where they could choose any activity they wanted to play as many times that lesson. Once the students became familiar with each of the active games after the first week of classes, there was little interaction between Leslie and the students. Regardless of the daily lesson the students would participate in the active games independently or with a partner with little assistance from Leslie unless there were technical issues with the equipment or behavior problems. Once the students started playing a game, they were in the virtual world of the game often experiencing it with a peer.

At the end of class, the afternoon school announcements would be heard over the intercom. Leslie did not stop the students to listen to the announcements nor did the students stop playing the games to try to hear them. At the end of each class, Leslie would turn off the lights and tell the students to stop game play and have a seat. Although the students were often reluctant to hurry and sit down, they would come together as a class sitting in front of 3 kick facing the center of the room as they had prior to the beginning of class. At this time, Leslie would spend 1-2 minutes discussing the lesson that day. Some classes she would mention the learning components associated with the lesson while other days she would simply give praise for positive behavior and proceed to take roll and dismiss the students for the day.

Experiencing the Curriculum

This section describes the active gaming lesson plans and how the students' experienced each lesson. The data provided describing the students' experiences with each lesson plan illustrates the social interaction the students engaged in during active gaming participation. All lesson plans can be reviewed in Appendix G.

Lesson Plan #1

The first lesson covered the first three sessions in the active gaming room. This lesson was designed to be semi-structured in order to let the students explore the activities; yet, there was a learning objective intended for each student to understand therefore some structure was necessary. The focus of the first lesson was for students to learn various muscles of the body using the active gaming equipment as the tool to accomplish this goal. After students participated on an active game, they were asked to

write on their worksheet the muscle groups they felt were used in the activity. Students were put into groups of three by Leslie and asked to fill out a worksheet about the muscles of the body. The three girls in the study were in one group and the three boys were in another group. The students had five minutes to explore an active game and then were asked to rotate to a new activity. They were encouraged not to repeat an activity until they had been to each activity once and had completed the worksheet. The activities allowed for two out of the three students to be active, the third student (not active) had the job to record group responses on the worksheet. The students were often engaged socially by talking to or watching their peers instead of working on the worksheet. Leslie mentioned to me that the students were not used to filling out worksheets in class, so she needed to do a better job of reminding them to focus on what they are learning as they play the games. Leslie reiterated the importance of the worksheet at the beginning of the second class and the students paid more attention to completing the assignment. Leslie would also remind them that they were not to repeat an activity until they had been to all activities and the worksheet was complete.

As the students entered the active gaming room the first day of class, their eyes quickly searched the room looking at the different activities they were about to play. Leslie had instructed them to "walk in and sit down in front of the 3 Kick immediately." There was little talking, but a rumble of whispers could definitely be heard. The six students sat down and faced Leslie waiting for instructions. Harris was sitting beside a peer pointing at the Gamebikes and Joey was sitting beside Wilson looking at the Gamercize (GZ) activities. The three girls were sitting quietly with their legs crossed and their eyes on Leslie. Leslie began putting students into groups and handing out the

worksheets for the lesson.

As the boys groups was called, all three quickly stood up. Harris took the worksheet and pencil and they hurried to the XrBoards. Harris and Joey jumped on first while Wilson watched. Harris was talking about the game while staring at the screen the entire time. Joey had a smile on his face as he was playing. Wilson was smiling and talking to the other boys as he was watching them play. They were racing each other down the snowy hill on snowboards. Every once in a while the boys would make comments like, “oh no” or “check that out”, or “that was so cool.”

The girls chose to play the Gamebikes. Angela and Ashlyn jumped on the bikes and Tonya watched. Tonya was watching the screen and would occasionally smile when Ashlyn wrecked her bike while playing the game. Angela was smiling and started pedaling faster on the bikes as if she began to realize the faster she pedaled the faster the bike would move. Ashlyn was focused and her eyes were locked on the screen. Ashlyn was pedaling fast and seemed to lose control of her bike and said, “oh my gosh. Where is it going?” Angela just smiled and kept pedaling.

Due to the large number of students in the class, during this lesson plan the students were in groups of three where only two could play at a time. If an activity appeared to be open to play, students would move to play the open game instead of waiting with their group. During one rotation, the boys went to the Wii station where Joey and Wilson played and Harris was waiting and watching. As fieldnotes stated, “Harris tried to go to Xavix boxing since it was open assuming he did not want to wait to play; however, he was quickly told by Leslie that he needed to stay with his group. He apologized and quickly walked back where he watched his partners and continued to talk

through the game with them. Joey and Wilson smiled and laughed while they bowled together."

When students did have to wait, they were intently involved in their partners' game play. Students would make comments about the characters in the screen or about strategies related to the game. During one rotation in the first lesson the girls went to GZ. Tonya and Ashlyn were both on the steppers but only Ashlyn was controlling the game as the game was on single player mode. Although Tonya was not actually controlling the game, she continued to step in sequence with Ashlyn while watching the screen intently. Tonya smiled and said, "Where are you going." Ashlyn giggled and kept playing. Tonya had a grin on her face as she continued to step and watch Ashlyn play. Ashlyn said, "This is so cool," as she starred at the screen. Ashlyn seemed to become frustrated with the game and said out loud, "How do I get up there? I need to get up there but it won't go." Tonya kept a huge grin on her face while watching the screen and pointing she said, "try to move over there first. Maybe you have to get that over there first." Both girls continued to step while watching the screen. Angela was working on the worksheet but would stop and look up and watch the game play periodically. In addition, the students would engage in competitive discussions. During one activity Joey and Harris were playing baseball on Nintendo Wii. Joey was swinging the remote missing the ball several times in a row. He said, "Dang it. I am missing it!" Harris said, "Cause I am blowing it by you." Then Joey made virtual contact with the ball and said, "OHHH….yeah, home run. Home run! I got you boy, I got you" (pointing at Harris). Harris shook his head and laughed and said, "You better get ready." Both boys starred at the screen ready for the next play.

The following fieldnotes illustrate additional experiences the students encountered playing the active games during the first lesson:

> The boys went right to the Gamebikes during the last rotation. Harris jumped on to play against Wilson. Harris was pedaling very fast while talking to the character on the screen, telling it where to go and what to do. He was laughing hard. Wilson was smiling as he was pedaling trying to be more in control by slowing down his pedaling when he was about to wreck. Joey asked to switch and Harris jumped up and let him. Harris went over to watch Xavix and was laughing with the other boys that were boxing. Then he went back to stand by Joey and watched the bikes. Joey said, "Ah, I love this". Harris asked to switch with Joey quick again so Joey got up. Joey's face was red and he was sweating and smiling. Joey said as he was switching "Man, this is good (giggled)….this is hard". Harris appears to be eager to play.
>
> The boys jumped on GZ first – Harris was first. He figured it out quick and was talking to the screen with Joey as he stepped and controlled the game. Joey was intent in watching and making comments. All comments were related to the game and not the exercise. Joey then switched with Harris after a few minutes and was quickly into the game. Wilson was watching and pointing at the screen discussing where Batman and Robin should be going and what they should be doing to win. Joey was smiling as he was stepping and his face quickly became red. It was almost time to rotate and sweat was starting to fall from his face.
>
> The girls went to Xavix and Ashlyn jumped in first to box. She was boxing fast and staring intently at the screen. Angela was looking around at the room. Tonya was watching the screen closely. Angela switched with Ashlyn. Angela was passively punching but was engaged in the game. The custodian came by before leaving and said "oh, you knocked him out!" Angela said "that's the second time" while she smiled at him.
>
> Girls went to 3 kick and each took a tower to play. After each game they would reset a new game to 30 seconds. Angela would use her knee to hit the middle and low lights. Tonya was laughing and smiling every time a new light would illuminate. At the end of one game, Ashlyn pointed at the score and said with a huge smile, "113 points." Ashlyn reset a new game to 30 seconds again.

> During the last rotation, the boys went to Xavix boxing and Harris jumped on first. Wilson sat down in a chair to watch and wiped his face that was dripping with seat. Joey was working on the worksheet and then was around the room. Harris was punching intensely as he watched the screen closely. In the middle of the game, he said as he grabbed his arm, "Oh, my arms," and then handed the gloves to Joey. Joey boxed for a short amount of time and said, "This is hard" as he continued punching fast. Harris went over to the Gamecycle and started pedaling but Leslie told him to stay with his partners. He stopped pedaling but started again when she left. When another group came over, he respectfully went back to Xavix boxing to watch his peers. Then he sat down in a chair with an exhausted look on his face and pink cheeks.

The last day of lesson one Leslie was adamant to provide extra time after class in order for the students to complete the worksheet. She was concerned that they may need more time due to a lack of experience working on assignments in Physical Education class. Although the learning objectives related to the lesson were not discussed, the students' experiences with the first lesson did demonstrate involvement with learning the various muscles. As Tonya stated, "I feel this is great and that it is very physical and you can learn things like parts of your muscles and me I haven't learned any before but I really want to and that is why it is called physical education and that's how I feel." In addition, during one rotation the boys had moved to the Gamebikes. Harris and Wilson jumped on the bikes first and Joey was watching. Harris was pedaling very fast while he was talking and laughing with his peers. After approximately 1 min and 45 seconds into playing Harris said, "I can feel it!" as he was pointing at his calves.

When class time was over, Leslie would turn off the lights to signal for the students to finish game play and sit down in front of 3 Kick. During the first lesson, the students were reluctant to immediately stop their activity. Leslie would turn the lights off again to warn the students a second time to be seated. Once, Wilson was in the middle of

playing DDR after Leslie had turned the lights off the second time. Although Wilson's partner Joey had followed instructions and sat down, Wilson continued to play. Leslie walked over to Wilson and said sternly, "Wilson, come on, that's the second warning you need to sit down now." Wilson looked around and jumped off the DDR pad and then sat down quietly.

At the end of the class, Leslie briefly reviewed the lesson with the students. Leslie asked the students to discuss an activity they played and what muscle they felt was being used. Harris answered with, "my calves, when I was on the bikes "(pointing to his legs). Joey volunteered to answer the same question and said, "The biceps when playing the Gamecycle" as he pointed to his biceps smiling. Angela raised her hand and answered "My quadriceps on the bikes" (pointing at the Gamebikes).

Lesson Plan #2

The second lesson plan covered four class periods (Sessions 4-7) in the active gaming room and focused on a semi-structured rotation. The students were in groups of three and played two activities each class period in order to complete a "Feel the Beat" worksheet. The students were supposed to be able to choose their groups of three; however, Leslie forgot and put them in the same groups they were in during the first lesson. The lesson focused on understanding the three intensity levels (low, moderate, high) in order for the students to begin paying attention to their bodies and how they felt a particular activity made their heart beat. The students were asked to circle on a worksheet whether the active game they completed would be classified as low, moderate, or high intensity. The students had 8-10 minutes at each station before they rotated and

chose their next activity. Students were asked not to repeat an activity until they had completed the worksheet. The allotted time (8-10 minutes) was a modification from the first lesson as the intent was to let the students restart games in order to take ownership in how they performed in the game and five minutes would not have been a sufficient amount of time.

Leslie introduced the lesson with an analogy of two different types of activities. She explained that sitting still, not being active, would be a low intensity activity. She compared low intensity to running in place as fast as you can for two minutes bring a high intensity activity causing the heart to beat faster. She passed out the worksheets and asked the students go to their first activity.

The students were into the routine of entering class quietly and sitting in front of the 3 Kick. The students would point to games as they walked in whispering to their peers. The three boys and three girls were placed in the same groups for lesson two as they had been in for lesson one. The boys were sitting together pointing at various games around the room. Once Leslie called their group, the students rushed to take the worksheet and pencil and to find their first activity to play.

Every once in awhile, the students would physically touch their chest to feel their heart beat in order to determine the intensity level of the activity during class time. During one incident, Willie had been on the bike pedaling with Joey and then got off to let Harris take a turn. Willie went up to Leslie and said, “Wow, feel my heart.” And Leslie put her hand on his chest and said, “Ooooh, yeah, really beating fast.” Willie smiled as he put his hand back on his chest and then went back to watch his group on the bikes. Ashlyn and Tonya had finished a song on DDR and both girls tried to feel their

heart beat by putting their hands on their chest. Tonya smiled and Ashlyn said, “Mine’s not that high.” Tonya did not say anything just smiled. Ashlyn stepped off the pad and said, “Mine must be moderate so DDR was not high intensity.” The following is an excerpt from fieldnotes capturing a learning experience with two students before class during lesson two.

> Joey walked in and sat down beside Willie. Joey said to Willie, “Let’s take our heart beat” and both boys put their hand on their chest. Joey stood up while other students were still coming into class and started running in place. Then he sat down and put his hand on his chest again. “Wow, it’s a lot faster not” grinning as he talked to Willie.

Throughout the four days of lesson two, the students experienced playing each of the active games. Regardless of which activity the students played, they were engaged and interacting with the game and their peers. Sometimes the students would assist one another in learning the game or strategies within the game. During one activity, Angela had tried a mode on DDR that too difficult for her. The arrows were flying up the screen and although she was stepping quickly she was not experiencing success. Noticing Angela struggling, Ashlyn, who was standing behind Angela watching, said, “I got the back arrows, you take the other ones” and she stood behind the pad stepping on the back arrows while Angela tried to hit the other 3 arrows. Angela remained focused at first but when Ashlyn began to laugh she too started giggling. Both girls finished the song laughing and stepping together. The girls also experienced assisting one another while playing the Gamercize (GZ) activity. The girls were smiling and laughing playing Batman and Robin and talking back and forth about strategies in the game. “I’m up here now Batman” Ashlyn said to Angela. Angela was not moving her character to the suggested area on the screen and Tonya said, “Go help Robin” (Ashlyn’s character) and

was pointing on the screen where she needed to go. Angela said sternly, "I'm trying to help but she keeps going over there and I can't get over there" as she pointed at a location on the screen. Ashlyn said, "Oh, I didn't know I had to go there, wait for me there."

The following are brief fieldnote excerpts illustrating additional peer assistance experiences:

> Joey and Wilson jumped on the dogfighters first and Harris was watching. Harris then turned around to help two peers on the Gamercize activity. He explained how to use the controller to be Batman or Robin and was pointing at the screen. Harris then turned back around and started watching Joey on the Dog Fighters. Harris said to Joey giggling, "Take a deep breath in between" as Harris was smacking Joey's knee every time he would pedal and his knee would raise up as if he was trying to motivate Joey to pedal faster. Wilson said to Joey, "shoot it, shoot it" and Harris said, "You got to shoot the air balloon" and Joey said, "OHHHH" (not aware of the strategy of the game). Wilson switched with Joey because Joey crashed and Harris jumped on the other DF and was pedaling with Wilson although his bike was not working. Joey was grabbing the handlebars to help Wilson play and Leslie came by and told him to stop and let him play his own game. Joey said, "I'm sorry, ok" and then began to encourage Wilson during the game verbally.
>
> Wilson and Harris jumped on the DDR pads first. Joey watched and was suggesting songs for the boys to choose. Joey's face is red again. They choose the popular song by Chris Brown that the entire class seems to want to play and sing along too. Both boys are staring at the screen intently with little expression. Harris switched with Joey after one song. They are trying to figure out which song to play. Wilson wants a faster song so it is more difficult but did not know which song to choose. Harris helped the other boys realize which songs are faster by pointing out the BPM (beats per minute) on the screen. He said, "You just look right here and if it is higher than the song is faster. That way you don't have to move up another level yet."

The students once again demonstrated a relentlessness to want to participate in game play to the point where they took a risk of getting into trouble by not following

instructions. Not only did the students continue to play once Leslie signaled for class to be over, but they also continued playing when it was time to rotate to a new activity. Once, the girls were on 3 Kick when Leslie signaled for the students to rotate to a new activity. The girls had just started a new game so there was almost 45 seconds left to play. The girls continued to play, each on a tower, not seeming to care that another group of three was waiting to play. One of the peers waiting said, “Hey, it’s our turn, hurry up.” Ashlyn said, “We are almost done, just wait a second.” Leslie did not notice the girls had not rotated. The girls finished the game and quickly left the game. In addition to the students not finish game play when instructed, they were eager to engage in game play. Before the last class started during the second lesson, the girls had created a “game plan” in order to start on DDR. As soon as Leslie called the first group up for the day to get started, Tonya snuck to DDR to hold it for her group. The girls were not supposed to be at DDR again as they had already completed this activity on their worksheet. However, this did not seem to bother them. When the girls group was called, Ashlyn quickly got on the other pad and Angela grabbed the worksheet and pencil. The girls quickly picked a song and started playing without saying a word.

Furthermore, Leslie had warned the students not to repeat an activity before they had completed their worksheet. In fact, she warned them before and during class several times. However, many students did not follow these directions. During one class, Leslie told the students during the introduction that the ELP students would be leaving early. She said, “When I turn off the lights for the ELP students to line up, they need to do so immediately but the rest of the class can continue playing. Harris and Wilson were ELP students. When it was time, Leslie turned the lights out for the students to stop playing

for dismissal of the ELP students. Harris and Wilson did not line up. They both continued playing DDR. Harris finished the song and got off the DDR pad as if he were going to line up. Then he jumped on the Gamebikes with another peer while the line of ELP students was walking out the door. Leslie looked at Wilson and he immediately jumped off DDR, handed me the pencils, and hurried to the end of the line to leave. A peer peaked inside the room and yelled at Harris, "Harris, come on". Harris jumped off the bike and ran out the open door. The girls were guilty as well:

> Ashlyn and Tonya are back on the DDR and Angela is watching. This is the second game in a row they have played on the DDR but Leslie does not seem to notice nor do their other peers. Yesterday (3rd session of this lesson), the girls played several games on DDR as well. They do not seem to care that Leslie has instructed them to complete their worksheet before repeating an activity. They have not gotten into trouble yet so I am assuming that is why they continue to play.

Leslie expressed enjoying letting the students stay on each activity for a longer period of time (compared to the first lesson). She believed it allowed all students in each group to experience the activity during each rotation. In addition, she believed the longer rotations "reduced transition time which made them behave better." The following excerpts from Leslie's journal entries explain how she felt about the second lesson plan:

> I really liked having a10 minute interval at each station. The students got to spend enough time to learn the ins and outs of the activities. Also, the students seemed to do a better job of sharing and taking turns with the 10 minute intervals. I think that because they had more time, the whole class did a better job with the worksheet as well.
>
> The students did well today continuing with the 10 minute interval stations. Questioning them as I went around the room, they appeared to understand the concept of low, moderate, and high intensity. .

Lesson Plan #3

The third lesson covered two classes (sessions 8 and 9) and focused on the students learning the difference between muscular strength and muscular endurance. This lesson was designed to be unstructured. Students could move around the room with free choice playing the activities they wanted to play. They could also choose to play independently or with other peers. There was an affective objective in the lesson plan focusing on the student's sharing the equipment and taking turns with peers in order for all students to have an opportunity to play an activity if desired. The lesson plan asked the students to try to remain active as often as possible limiting waiting time to only one student waiting for an activity at a time (E.g. two students playing the DDR pads and only two students waiting to play the next game). Dance Dance Revolution was a very popular game with the students, so by implementing this affective objective it was the intention that all students would be able to play desired activities. The students were asked not to wait long periods of time for the equipment.

As Leslie finished explaining the instructions, the students seemed excited to get started as many were already starting to stand or were scooting on their bottoms closer to the activities. Joey was up on one knee ready to run to an activity. She said, "Joey (smiling) you need to sit down. I know you are excited". She then let all the girls go first and then dismissed the boys. Most kids ran to DDR including Ashlyn, Wilson and Harris. Angela went to GZ with a peer and played it the rest of the class. Joey jumped on an XrBoards with a peer and Tonya went to Nintendo Wii.

Being an unstructured lesson the students were able to play the games they wanted and when they wanted as long as they took turns. Initially, the students would

play a game and then get back in line to play the same game again. They would repeat this behavior until there were too many students waiting to play or they seemed to be ready to try a different activity:

> Harris finished his song on DDR and went right behind the pad to play again. Harris was waiting on DDR and said, "Ah man that was perfect" as he watched a peer step fast and "perfects" ran up the screen. Harris played two more times on DDR and then rotated with a peer to 3 kick.
>
> Joey and Wilson are back on DDR together. Wilson keeps a smile on his face while Joey smiles and then gets serious. When the song is over, they quickly get off and get back in line to wait one turn and then play again. When it is their turn again, they start bouncing up and down waiting for the arrows to move up the screen.
>
> Wilson is on DDR, smiling and finished playing. Looked at peer and slapped a high five with him. He did not want to get off and a peer waiting that was much larger grabbed him around the waist and gently moved him off the pad. Wilson was smiling and immediately got back in line to play again.

In addition to the students initially repeating activities, this unstructured lesson compared to the semi structured and structured lessons, encouraged additional peer interaction as students moved around the room freely with different partners. The students were not just interacting with their partners, but they were interacting with any peer playing an activity that they were interested in at the time. During one activity, Joey was on 3 kick playing alone. A female peer wandered over and jumped in to play with him. Joey gladly accepted the assistance as he was smiling and so was she. Joey's face was turning red as sweat was dripping down his forehead. The students waiting to play an activity were also interacting with the game play. In one experience, Ashlyn was playing DDR with a peer and two boys were waiting to play. Ashlyn said "I feel weird"

giggling and her peer playing started laughing and said, “What am I doing” as she was missing the steps and getting “boos” on the screen. Ashlyn died laughing and the peer said while laughing, “Shut up”. Ashlyn kept laughing very hard and then the boys waiting behind the girls started making comments about Ashlyn on DDR missing some of the steps. Ashlyn kept laughing (the boys were laughing) and she turned around and said, “Stop” turned back around and said giggling, “Where am I stepping”. The boys behind her were giggling and smiling. Additional peer interaction experiences during this lesson are illustrated in the following fieldnotes:

> Tonya had jumped on 3kick and another girl ran up to her to hit a few lights. Tonya seemed to welcome the peer’s help. Tonya was smiling the entire time on 3 Kick running to the lights kicking and punching. She then slowed down as if she was getting tired and walking fast to the lights instead of running. The timer went off and both girls smiled at one another and set the timer to play again. Tonya was still smiling.
>
> Joey is waiting and watching Wilson on DDR. Joey got real excited for Wilson and said, “Wilson, Wilsonnnnn” smiling so big and laughing as he watched Wilson stepping fast trying to match the arrows on a level that appeared too difficult for him. Shortly after the screen said “Failed” and the two boys looked at each other and start laughing.
>
> Ashlyn was on DDR and put it on heavy mode that was too hard for her and her peer. Ashlyn was jumping around trying to hit as many arrows as possible as fast as possible. She is dying laughing with her peer and the peers watching. Her tongue is pushed to the side of her cheek making it protrude – she continues to giggle and make noises like, “ohh, ah man, oh my gosh.”Wilson is practicing behind her with a slight grin but focused trying to play.

The students were more willing to challenge one another to a game during this lesson. This may be because they were more comfortable with the games and had a choice with whom they competed and in which activities they chose to compete. Wilson

had been playing DDR several times during one class. As he finished a game and stood back in line to play again, he glanced over to another classmate that was playing DDR on the other side of the room. Wilson walked over and whispered to the girl playing that he wanted to play her. Another peer in line said, "You gotta get in line though" and he said, "Nah, I just want to face her" and walked back to the other DDR and got back in line. The girl he challenged got off and came and waited with Wilson to play.

The students remained on task throughout the entire three class periods covering lesson three. As I would periodically look around the room, all students were either playing a game or closely involved in watching another peer's game. At one point during the last class of the third lesson, I listened to the majority of the students singing the Chris Brown song that was playing in DDR. This song was popular with many of the students and they would play it over and over again while playing DDR. The other students would sing as they played the other activities or were engaged watching their peers' game play.

Initially, Leslie had expressed concern about letting the kids move freely with a lack of structure. However, after this lesson, she began to feel more comfortable with the students' ability to be responsible in an unstructured environment. The following are excerpts from Leslie's journal and an interview response on this unstructured lesson:

> The students were allowed to move around the room as they wished today. The directions were that only one person could wait for each of the activities. Initially, the students did not follow the directions and there were too many waiting at some of the stations (mainly DDR). After reminding them of the rule, the students did a good job of moving around to the various activities and only having one person waiting for a turn. All the students seemed to enjoy this method of freely moving around. I thought in general that the class went very well in both activity level and behavior.

> Today the students continued moving around the room freely. They did an excellent job of having only one person waiting their turns at the stations. The students were all keeping busy and they looked excited as they waited for their turn.
>
> "I think the kids have been better than I expected. Especially with a lot of this let them go on your own type of thing. I've just been pleased about how they've responded to everything. I think they've done a pretty good job. And they're pretty much paying attention, know what we're talking about with the muscles and endurance and all that. I mean, if I asked them every single one they probably wouldn't know. But if some of them are getting it; it means the information is getting there. And if they're willing to listen and getting it. I've just been pleased with how things are going so far."

At the end of each session, Leslie would ask students what activities they played and if they felt like they were developing muscular strength or muscular endurance. Not many students raised their hand including the six participants. The students that did answer the question were not probed to explain why they gave their answer.

Lesson Plan #4

The fourth lesson plan covered four class periods (sessions 10-13) and focused on understanding heart rates and how to calculate average and maximum heart rates. Students selected their own groups of three for the fourth lesson plan. Students rotated in a structured station set up – nine total stations. They spent approximately 8-10 minutes at each station before they were asked to rotate. Before starting students were asked to find their resting heart rate by calculating their pulse (10 second count and multiply by 6) and record it on the provided worksheet. Before students started class, before each station rotation, and at the end of the class, Leslie asked the students to take their pulse for 10 seconds and multiply it by 6. At the end of each class, the worksheet instructed the

students to find their minimum heart rate, maximum heart rate and their average heart rate; however, Leslie did not discuss this with the students. The students did not calculate their maximum and average heart rates.

As soon as Leslie mentioned the students would choose their groups of three, the students began shifting closer to one another as if they were secretly picking partners. One peer put her hang on Ashlyn's shoulder and Ashlyn turned and smiled but remained sitting quietly for further instructions. Leslie called up the name of a student and that group would grab a pencil and worksheet and choose a station at which to begin. Harris's group ran to the Nintendo Wii's where one girl was already standing. The girl said, "We were here already," and Harris responded by saying, "No you weren't, nobody else is here but you. You can't hold, you can't hold it." The girl turned around and left. Harris and his partners started playing baseball together.

All students were quickly in groups and at a station playing. Angela's group went to Xavix boxing and GameCycle (GC) first. Angela began playing GC and her partner was boxing. Leslie walked up to Angela and commented on her game play by saying, "Wheeeew, you are doing good!" Angela was smiling as her other peer was watching and waiting to play. The partner on boxing got off and the peer watching Angela said, do you want to go (play boxing), Angela?," and Angela said, "Sure" and left Gamecycle to go to the Xavix boxing. Angela had expressed in an interview and journal entry that she did not enjoy the boxing game because she, "didn't like to punch things and the game did not always punch when it was suppose to." Although Angela had expressed this frustration with Xavix boxing, she had a different experience while boxing this time:

> Angela was boxing at a consistent pace and soon knocked out her computer opponent. She said, "knockout" and watched the screen as it counted to 7 and then the opponent got up. She started boxing again and quickly knocked out the opponent again and said, "Yeah, knockout again but stay down this time. Hey, where's Tasha (turned to find her partner). Hey I knocked him down and it was already a knock out. Now I go to the championship." Tasha laughed and was watching the screen. Angela was grinning and back in position ready to play again.

Once again, competition became an obvious form of peer interaction as all six students competed with another peer during an activity. Angela was considered the least competitive of the six students and she appeared to enjoy engaging in competition. During one rotation, Angela was on 3Kick with two others playing one at a time for 30 seconds each. Although they were comparing scores, the students waiting would try to hit a light before the student playing if it illuminated on a pad close to them. Angela was near a tower when a light came on and she tried to hit the light before the peer playing would get to it. The girls started laughing when this happened. When the game was over, she tried to play in front of another peer and the peer said, "It's my turn" and Angela smiled and took a step back and let her play first. When it was Angela's turn to play she moved quickly trying to hit the lights as fast as she could, keeping a slight grin on her face. At the end of the game, she looked at the score and said, "Who is next" then rotated out to watch.

The following fieldnotes demonstrate other students competing against themselves or other peers during lesson four:

> Harris is on the XrBoards snowboarding down a mountain against a peer. The peer says, "So, we tied?" and Harris says, "How dare you. Oh, now we tied, how about that." Peer says, "No" as he

smiles. The game finishes and they compare scores pointing at the screen. “I got you” Harris said, smiling and pointing at the score. Peer just shakes his head and smiles.

Wilson and another girl are challenging one another on DDR. This is the girl that Wilson told me had beaten him before. The entire rotation they challenged one another on DDR. Right now they are waiting behind the pad singing to “Get Busy” and practice stepping. Wilson and his peer are on light mode and play the same song (“Get Busy”). The song ended and his peer received a C and he received a D. Wilson just smiled and said, “Ok, 2 to 1. I will beat you next time.”

Wilson is back on against his peer and playing on Standard mode. They both are not doing great. The lights go off to finish up for the day and they finish their song. Looking at the score he says to her, “yeah, I won.” She said, “no we both got an E”. Wilson said, “no, look at the actual score, right here” as he was pointing to the number score. She said, “oh, ok”. Wilsons said with a huge grin and sense of accomplishment, “yeah, 3 to 2, I won”. She said, “I’ll get you Monday” and sat down quietly.

Ashlyn just finished a game on 3 kick by herself and she looked at her score and squealed a high pitched, “yeahhhh”. She went straight to the paper on the wall and wrote her name as part of the 100pt club with 107 points. Her peer started playing and Ashlyn turned around to the board and traced her name and points with her finger. She appeared to be proud of herself.

In addition to competing, students were once again assisting one another during game play and communicating about the games. The following demonstrates a conversation Joey had with his peers playing Gamercize (GZ) with a new game called Spryo. Joey had played it at home and was excited to help his peers with the game:

Joey went over to watch his two partners already on GZ playing spyro. Joey was into this game and was commenting as they were playing: “Ahhhh…dragons. This guy is hard” a peer said. “I know, I told you. Oooohhh, did you see that fire!” Joey said, “Yeah….no that one is spyro no me” a peer said(one of the peers thought he was spyro and was not). If I were you I would just stay

> in the back," Joey suggested. "Ahhh…he did a roll in the air. Did you guys see that? I still think I am better than that" Joey commented. Joey's peers are talking back and forth and one said, "Oh, you are spyro now" to his partner playing. "No, but now I am" the peer replied. Joey commented, "You beat em? Yes, you be em. I want to be Spryo. Who's spyro? I want to be spyro now. This is really cool!"

One peer was assisting Tonya while playing the XrBoards. The peers said, "Ride that rail. I think you get more points." Tonya responded, "But how, I don't know how to get on it up there." The peer pointed to the screen, "You just get over to it and you just go, it just goes or you can press this button and try too" as she pointed at the button on her own controller. Then the peer said, "And anyway, it's easier to play if you hold on and bend your knees like this" showing her how she bends her knees while standing on the board. "My legs be burning after it but it works better." Tammy modeled the girls form and started slightly bending her legs when she was playing.

During this lesson, students were hesitant to rotate stations when Leslie turned out the lights as the signal to move to the next station. Leslie had turned the lights out for the second time during one class and Tonya was still on DDR stomping hard and smiling as usual. She was trying to finish her game before rotating. She started to get off and then kept stepping back on the mat in front of another peer that jumped on to play. She then went to the side of the mat and continued watching and stepping to the arrows until the song went off. Then she rotated to Wii. She seemed relentless to want to finish her game, even if another peer started playing and she finished off to the side pretending she was playing. It was during this lesson that Leslie warned the students a second time about ending the class more quickly. She explained, "I am trying to let you play all the way up

to the end of class; but, if I do that then you have to cooperate when it is time to finish. If not, I will have to start ending class earlier." The students just sat quietly and listened.

By the end of the 4th class during this lesson, most students appeared capable of finding their pulse. Some students were excited to try to find their pulse individually or with peers before and after class. I noted during one class, "Several students came in the active gaming room talking about their pulse and immediately started taking their pulse. Lynda walked in and the students were already finding their pulse. Lynda seemed happy to see this and decided to spend a little extra time with students that still were unable to find their pulse." As additional fieldnotes suggest:

> After the last class during lesson four, I walked out with Joey and he said to me as he walked out, "I love this place." He then went over to Wilson and said, "I want to be in a group with you. I want to be in your group." Wilson just grinned. Joey said, "Let's take our pulse" and both boys put their hand on their wrist and tried to take their pulse. Neither boy commented on what they thought their pulse was.
>
> The lights went out and Lynda said, "Everyone find your pulse and get ready." Lynda then said, "Start now" and the students were silently counting their heart rate. Lynda said, "Stop, and have a seat. Make sure you remember that number." When Lynda asked the students what their heart rate was, a hand from almost every single student went up desiring to share with the class. "Angela, what was your heart rate" Leslie asked. Angelic responded by saying quietly, "Like 120." Then Leslie asked a few other students before she let the students leave for the day.

Initially, Leslie did not believe lesson four was structured enough for the students by letting them remember the stations they would be rotating to each day. In addition, she did not believe the students were capable of finding and taking their pulse correctly:

> She basically laughed at me when I said the kids were going to pick their own partners and when I talked about them taking their pulse for 10 sec and multiplying it by 6. Then she also had a problem with them thinking they could rotate in stations in order. But, she was willing to try as she said, 'Hey, this is your study so I will try whatever you want'."

Leslie was surprised to learn that the students enjoyed taking their pulse and were capable of performing this lesson appropriately. As she wrote in a journal entry:

> This week we were to continue with the students taking their resting/exercising pulse. I reviewed the procedure for taking a pulse again. The students seemed quite interested and they really tried to find their pulse point. I am pleased with how the students are doing with the lesson. They are getting along and rotating in order. They are doing well.

Lesson Plan #5

The fifth and final lesson plan focused on understanding the importance of obtaining moderate to vigorous physical activity 60 minutes a day on most days of the week as recommended by the National Association of Sport and Physical Education (NASPE, 2008). The goal for students was to obtain as many minutes as possible of moderate to vigorous physical activity during physical education class and to recognize the importance of being physically active outside of school. The lesson plan suggested Leslie introduces the unit by briefly explaining the goal and importance of obtaining 60 minutes of physical activity a day. She then explained that there was a scavenger hunt card to complete during the next two classes. The goal with the scavenger hunt was to obtain as many of these minutes in class as possible. Students worked independently or with a partner in order to complete as many activities on the scavenger hunt worksheet. Students were asked not to repeat an activity until the scavenger hunt was completed. After each class it was suggested that Leslie let students discuss how many activities they

were able to complete, review the 60 minute per day goal, and possibly let them suggest how they can get more physical activity at home. Unfortunately Leslie came to class the first lesson without having reviewed the lesson plan and was not familiar with the scavenger hunt games as they were different from previously played activities:

> This is the first day of the fifth lesson plan focusing on the scavenger hunt and amount of minutes spent being physically active. Leslie had not reviewed the lesson plan I sent and handed to her previously. She did not introduce the lesson understanding the main learning component. She focused on the worksheet and them getting it done…She got them in and quickly going because she was leaving 5 minutes early. She just told them that each student needed to complete the worksheet but they could play with a friend or partner if wanted. She hands out the pencils and papers and then lets them go.

As a result, the students were playing activities that were not listed on the scavenger hunt card; they were not playing the appropriate games when at the activities listed on the card. For example, during one activity Harris jumped on the XrBoards with his friend even though this activity was not on the worksheet. Harris was on the XrBoards just playing having not once looked at this worksheet. He finished first place and threw his hands straight up in the air and smiled. His peer kept playing but shook his head with a smile on his face. They started a new game and continued to stay on the XrBoards. Leslie did not realize they were not supposed to be on this activity according to the lesson plan worksheet. In addition, I recorded in fieldnotes that Joey had been playing on the Gamebikes with a peer the entire class. His worksheet was blank so he was just playing to "play" and not concerned about what the worksheet was asking him to do at this station.

Leslie had to leave quickly the first day of the less so at the end of class she briefly mentioned continuing the worksheets for the next lesson, collected the worksheets, and then dismissed the class. After reviewing the worksheets that were turned in, it was clear the students did not understand the directions for the lesson. The worksheets were either not filled out or were not filled out appropriately. Leslie and I decided to let this be a one day lesson and leave the last two classes for unstructured play.

Lesson Plan #6

The last two days (sessions 15and 16) reviewed a previous rotation style, unstructured play. This lesson was designed to be completely unstructured where students would move around the room with free choice regarding the activities they wanted to play. The affective objective of focusing on students sharing equipment and taking turns in order for all students to have an opportunity to play was reviewed. The lesson asked students to remain active as often as possible limiting waiting time to only one student waiting for an activity at a time in order to increase the number of physical activity minutes they could accumulate in one class period. The goal was to achieve physical activity minutes in class toward the recommended 60 minutes of daily physical activity.

As with the previous lessons, student interaction was demonstrated as recorded in fieldnotes, "All students are engaged either playing the activity or watching another peer play a game. The noise level in this room is incredibly loud with the sounds from the games mixing with the conversations from the students. Some students yell and scream at the game or at their peers with excitement while others simply talk to the screen or with a friend about the game. This place does not appear to be a typical classroom setting where learning actually takes place. It sounds more like an arcade room."

The students had clearly become more comfortable with all activities in the active gaming room. As a result, during most game play rotations, students were engaging in competition whether it were independently, against the computer character, or with another peer. During one experience, Angela was playing DDR with another peer on light mode which appeared too difficult for her. She was clearly not successful the majority of the time but did not give up. After the game, the peer looked at Angela and said, "I won". Angela justified the comment, "Because you have played it so many times. It's because you have played it so many times" with a slight grin on her face. She went to the back of the DDR line with the peer to play again. Angela said to the peer, "I am going to try a different level this time. That was too hard."

The following fieldnotes further describe competitive experiences during the last lesson:

> Joey and Wilson went straight to the Dogfighters. Joey immediately said, "Wilson, press fire. Do you want moderate or easy. Go easy". Wilson just listened and followed instructions while smiling. Joey then showed an adult that there was an eject button. Pointing at it he said, "I thought it wouldn't really do this but it does. It really works. It is so cool." Joey and Wilson were pedaling intensely on. Joey has a red face already. Both crash and Joey said, "I saw you once but didn't' shoot. What happened? game over? Ahhh, nobody won - no points. I don't know what I will do, shoot balloons or Wilson? I am going to shoot you down Wilson." Wilson just smiled and continued setting up the new game.
>
> Joey and Wilson are still on Dogfighters and all of a sudden Wilson found Joey and shot him down. Wilson looked up at me and said, "I got him." He seemed so proud. Joey said, "Im gonna hurt him now" and Wilson said, "Sure you are" and was grinning ear to ear.

> Wilson and Joey moved over to 3Kick and played one game together. They both quickly took their jackets off during game play. Joey has a dark red face and sweat is beaded up on his forehead. Then they challenge one another for 1:30sec. Wilson played first. Joey stayed to watch Wilson and cheered him on, "Over there, it's over there. I'm gonna get you Wilson. Come on, hurry up so I can play." A peer came over and started helping Wilson. Wilson and Joey both said, "No Michael (pseudonym), stop." Michael immediately stopped and left the game smiling. After Wilson's game was over, he left and did not watch Joey play his game. Wilson went to the Gamebikes to play. Joey finished and went to find Wilson on the bikes and told Wilson, "I beat you. You lost." Wilson did not say anything and just smiled while he continued to pedal. Wilson's peer got up from the bike and Joey sat down and started playing against Wilson.
>
> Ashlyn has gone to Wii with a peer to play tennis. Ashlyn serves the ball and they begin swinging back and forth. Ashlyn wins the point and her peer says, "Ohhhhh NO" and Ashlyn says smiling, "Yeah, yeah, yeah. I got it in there" (in bounds). "Oh my gosh," Ashlyn squealed as the ball landed out of bounds this time. She said smiling, "We are so tied right now."

Part of the intention of this unstructured lesson was for the students to be responsible and take turns on the equipment. This affective objective would allow for all students to have the opportunity to play the games they wanted to play in addition to reducing behavioral issues. The students successfully accomplished the affective objective. The students would play a game and if someone was not waiting they would go get back in line to play again or simply move on to a different activity. Many students would survey the room and find an open game and hurry to the game to play and then move to another activity. During one activity, Joey was on the Gamebikes playing against the computer. A peer then jumped on the other bike in the middle of the game and said, "Can you start it over so we both can play?" Joey said, "Ok, I am gonna beat you anyway" as he was smiling restarting the game. Another example was when Ashlyn and a

peer were playing DDR. The song was too fast for both girls playing but they seemed to be enjoying themselves still trying to dance to the song and laughing with one another. The song was not yet over and one peer waiting said, “Ok, it’s our turn now” suggesting the game was over because the song was too hard for the girls to play. Ashlyn politely said, “No, we are still playing, hang on please.” The peers waiting just grinned and continued watching the game and waiting patiently.

The students summarized that moving around freely in the active gaming room was most desired. The students expressed that they enjoyed choosing their partners, the games they played, and how long they played them. Harris made the simple statement, “I think the best way to move around is by yourself or whom you choose to be with. Because you’re free and you really wouldn’t have to wait for your turn all the time you could just hop right on.” In journal entries and interview responses, the other students agreed that having a voice when participating in active gaming was most desirable:

> I think the best way to move around the room is for the kids to go to their favorite active game and it can only be two on the game and two waiting and that’s enough but there could only be a group of two because that would be too much for just one game. (Joey)
>
> I will pick free play because you can choose whoever you want to play with. (Wilson)
>
> “Um, if I was the teacher… I would let the students actually go where they want to go in this room. Um like…Free Play…Uhm. Like, if they don’t wanna do that one, I would say would you mind switching, because I want it to be fair for other students. (Pause) Yeah. And like if they don’t want to do Dance Dance Revolution, and I’m like ‘oh well, would you mind going to the (clear throat) Dance Dance Revolution,’ because I want it to be fair. And they’d say ‘Yeah yeah I’d love to,’ and it’d be good.” (Ashlyn)

> "Free play. Like I would go over there for one game. Then I go to one game over there. And do it again.' (Joey)
>
> "Free play and choosing my own partner. Because you don't have to wait like, 'cause sometime when you have to wait for the stations you only get to two games and it's time to go. And I like to be with my friends playing games with them." (Tonya)
>
> "Free play because you don't have to stand and wait for someone." (Harris)

Leslie supported the students' statements regarding that less structure was the preferred way to move around the active gaming room. Leslie seemed to enjoy this lesson structure as she believed the students remained on task and worked well together. As her journal entries stated:

> The students were allowed to move around the room to whatever activity they wanted as long as there was only one person (or no one) waiting at a station. The students really enjoyed this and they did a good job with the one person waiting rule. Everyone stayed busy and appeared to be having a lot of fun. The research students have continued to do well whenever I observed them.
>
> This was the last week for the research study. The students were allowed to go to whatever stations they wanted again. The students did very well with this on Monday. To my knowledge, the research students were not involved in any misbehavior and they remained on task during class. Whenever I observed them, they appeared to be enjoying themselves and keeping active.

During the last session of the inquiry, Leslie started the class as she typically introduced every class with the students sitting in front of the 3 Kick and providing them with the instructions for the lesson. At the conclusion of the class, the students were once again hesitant to stop game play. Angela was on the XrBoards trying to finish her game after Leslie had signaled for the class to finish game play. All students were finally seated except Angela and another peer pointed at her and told her she had to quit playing.

Angela said, “I am almost done” and continued to play her game to the end. Once the class was seated and quiet, Leslie reminded them that this was the last day of the research and that I would not be there watching them anymore. One student raised his hand and asked if they still were able, “to keep the game room?” Leslie grinned and assured him that the game room was staying at Kadia Elementary school for awhile. Harris then raised his hand and asked Leslie, “When do we get to come back in here again?” Leslie told the class she was not sure but she promised they would be coming back in the active gaming room to play. As she proceeded to call the roll for the students to line up, many students walked by, smiled, and thanked me. Joey walked up to me and said, “This is still the coolest room ever. I love this place.” He had a huge smile on his face as he walked out the door.

Student Experiences with Leslie’s Role

This section describes the lesson plans that were developed and how they were implemented during physical education class while the students were participating in active gaming. I quickly realized Leslie’s main focus in physical education class was behavior. Leslie mentioned that as long as her class was “on task and busy” she felt the lesson was successful. She explained that the students’ at Kadia Elementary “needed discipline due to the lack of behavior control at home.” She suggested that the most beneficial concept for her students to learn was how to behave appropriately. In addition, she believed the students needed to get active quickly and stay active as long as possible. As a result, learning components related to National and State standards were not a primary focus. After interviewing Leslie and receiving her journal responses, it was obvious she was not only focused on the students’ behavior, yet, she was pleased with the

behavior of her class while participating in active gaming. Leslie believed that in general, the students' behavior around the school had changed in a positive manner since the active gaming room became a part of the physical education curriculum. She explained that the students were "frightened that they may not be able to play in the game room if they did not behave in their regular classes." Leslie also prided herself on the fact that she had a strong discipline plan in action so that alone could be a solid reason why the students are behaving better knowing she will enforce consequences. The following comments are interview responses from Leslie regarding the students' behavior while experiencing active gaming during physical education class:

> Considering the difficult group that they are and the time of day it is, I thought they did a phenomenal job. And I think that part of that just goes to the discipline plan that is in place and the fact that they are highly motivated to be in here so they didn't want to do anything wrong and get into any kind of trouble. We still have a few who are talkative and that kind of thing. And these activities lend itself to that. So those kids didn't get into trouble, because they were allowed to talk, and that kind of thing. That's a good thing for them. But in general, just once they were notified that this thing was here, and that they needed to behave to do it, the whole fifth grade is behaving better. The rest of the two classes are saying 'When are we going in, when are we going in, when are we going in?' And they're behaving better. In general. So the whole fifth grade is behaving better, at least for me and that's very good thing that's happening. And like I said, the class has been in here two times. No one has gotten in trouble. They've gotten their points, which is a big deal here.
>
> I was telling the lady from a National television station who was evidently looking at our website and demographics. That makes me nervous when people start asking me questions like that. I told her in general, in regular PE, as well as in here, behavior has improved. So just the fact that this is here, even the kids that haven't actually been in here, but have heard about it and everything else, seem to be behaving better…But in general the

class is behaving better. So it's definitely having an effect. And it's a positive effect.

Yes, getting along with each other which is always a challenge. I was happy, just the motivation in them to participate in this that when I put them in groups, they normally would complain because they don't like so-and-so or want to be next to this one. They want to be with their friend so-and-so which, they didn't complain. Which is unusual. So, that was a bonus. They knew they just needed to be quiet, take our group and just get going. So they all, in their groups all seemed to get along. And they didn't notice, even when they were in the group that I put them in. They all seemed to get along pretty well, I didn't notice a lot of bickering or anything like that. But not bothering somebody, annoying somebody. There's a lot of that that goes on. You know, just poke somebody or just anything to annoy. And I haven't really seen that going on. There could be a little of it. I haven't noticed, much of that going on…But generally, they are getting along very well. Which is a big deal in fifth grade. Because fifth grade does not get along well. There's a lot of kids in there that have a lot of difficulty in social skills. They don't wanna take turns. It's all 'me, me, me.' And they're not yet in the 'we're all in this together.' It's all 'me, me, me, me, me.' So, I feel like, even with the little bits of things that have gone on that socially it's been very good. For them, it's been a big improvement, as to how they're getting along. Socially, physically, and behaviorally, you know, all the way around I'd say that we are doing better.

According to NASPE (2008), the role of a physical education teacher is to assist students in developing the appropriate skills related to health and wellness in order to guide students in becoming physically active and healthy for a lifetime. The students did not relate their active gaming experiences with learning. They mentioned their experiences to be "fun and enjoyable" but did not discuss what they learned from the eight weeks during the inquiry. I asked the students how they felt about needing a teacher what they felt the teacher role was in the active gaming room. The students agreed that

they do need a teacher but only to control behavior issues. As Angela stated, "We need a teacher because the class is kinda crazy and people would go everywhere and people get pushed and all that stuff, and we still need a teacher to keep it under some control." The other students' explained why they believed they needed a teacher:

> I think so (we need a teacher) because it will get all crowded and your head will explode into a big 'Boom!' with a headache. Because, the kids will be screaming out loud without Leslie being here. (Ashlyn)
>
> It would be kinda like.. different. Because, mostly it would be really hard because it would be going crazy and people would be in each other lines and then the machines will break and then we would have nothing. We need a teacher in here for discipline. (Joey)
>
> You need a teacher because you never know what they're going to do and they bring food in here and act bad. (Tonya)

Experiencing Learning During Active Gaming

To have successful experiences participating in the active games it was important for the students to learn strategies related to the activity whether it be physically or cognitively. The students expressed Leslie's role was to control behavior not to assist in learning. The students participated in active gaming independently or with another peer during each lesson. When participating in active gaming the students would often learn about the game by exploring it independently or through assistance from a classmate. Some students suggested they would rather "figure it out themselves" while others stated they would "choose a peer to help them". The following are comments from the students when asked if they would rather have help learning from the video game, a more educated friend, or an adult or teacher:

> I'd rather figure it out by myself, because I did it without the adults and can probably learn more stuff without them. (Harris)

> Wilson: Yeah, I'd also figure it out by myself because there are things in life you gotta' figure out yourself without anyone helping you. I think do it by myself because we can get responsibility and like start learning. (Wilson)
>
> I would just figure it out myself because I just wanna see what it can do, myself. (Tammy)
>
> Hmm. (thinking). I would pick the peer. They would tell me the way I need to know. (Joey)

The students' were often communicating with one another about what was going on in the game and/or assisting one another during game play. In addition, the students appeared to learn independently by reading onscreen instructions or by simply exploring the games opposed to asking for assistance from Leslie. The following fieldnotes capture the students assisting other peers and/or teaching themselves about the active games.

> Angela was still on GZ and very focused on the screen. I walked up to her and asked, "what is the goal of this game?" Still stepping she said, "You try to kill the bad guys, that's what you are suppose to do. I pointed at Batman and said, "who is that?" and she said, "That is batman and he is in his demolition suit which means you can blow up stuff. I said, "How did you know that" she said, "because it tells you things like that right here" pointing at the bottom middle of the screen – still stepping and focused.
>
> During the game Ashlyn said, "it's not working for mine". She was referring to the pad not working or the censor on the DDR game. After the game she looked straight down to the wire connecting the pad to the console and said, "oh, that's why". She smiled and reconnected the wire and said, "Mine's working now – its cause mine was loose".
>
> Angela put her mode on Standard and it was way too difficult for her to play. Ashlyn said, "I got the back arrows" and she played the back arrows while Angela tried to hit the other 3 arrows.
>
> Harris is at DDR talking with his peers about the different songs. They are trying to find a fast song on basic level. His peers are listening to all of the songs not understanding how to tell which songs will be

faster during game play. Harris quickly speaks up and helps the other boys realize which songs are faster by pointing out the BPM (beats per minute) on the screen.

Joey jumped on the dogfighter first and Wilson watched him and was smiling. Harris turned around to help 2 peers on the Gamercize activity. Harris said to Joey, "take a deep breath in between" . Wilson said, "shoot it, shoot it" and Harris said, "You got to shoot the air balloon" and Joey said, "OHHHH". Wilson switched with Joey because Joey crashed and Harris jumped on the other DF and was pedaling with Wilson. Joey was grabbing the handlebars to help Wilson play and Leslie came by and told him to stop and let him play his own game.

Angela is on GZ still – "no don't die. You get to go get that" while pointing at the screen and teaching her peer the game while continuing to play herself. "Whoa!!!! That was so cool. Did you see that?" talking to her peer.

Joey and Wilson went straight to the Dogfighters. Joey immediately said, "Wilson, press fire. Do you want moderate or easy. Go easy". Wilson just listened and followed instructions – smiling. Joey has played this several times and is more experienced with it. Joey then showed an adult that there was an eject button. Pointing at it he said, "I thought it wouldn't really do this but it does. It really works. It is so cool."

Joey went over to watch his 2 partners already on GZ playing spyro. Joey was into this game and was commenting as they were playing. "Ahhhh…dragons. This guy is hard" a peer said. "I know, I told you. Oooohhh, did you see that fire" Joey said, "Yeah….no that is spyro (one of the peers thought he was spyro and was not). If I were you I would just stay in the back" Joey suggested. "Ahhh…he did a roll in the air. I still think I am better than that" Joey continued to comment. His peers are talking back and forth, "Oh you are spyro" one peer asked. "No, but now I am" the other peer said. Joey commented, "You beat em? I want to be Spryo. Who's spyro ? This is really cool!"

Summary

The primary purpose of this chapter was to describe the students' experiences participating in active gaming during physical education. Data analysis suggested that

both the boys and girls experiences were parallel to the experiences described by the six students in this chapter. Chapter 5 describes the themes which were generated from this representation of students' experiences.

Chapter 5

Discoveries

The purpose of my inquiry was to explore the experiences of six fifth grade children as they participated in active gaming during physical education classes. In my inquiry, I also explored the experiences of three boys and three girls as they participated in active gaming. Data analysis suggested that both the boys and girls experiences were parallel to the experiences described by the six students. Because the experiences were deemed parallel little effort is made here to discuss gender experiences. It should be noted that differences in the experiences of these six children while gaming appeared to be influenced more by the character and nature of the individual children than by any male/female gender characteristics.

The discoveries examine one major inclusive theme from the research. This chapter includes an explanation of this major theme which emerged from an analysis of observational fieldnotes, interviews, and journal entries. The analysis was done by comparing data sources in an attempt to confirm, eliminate, modify, and/or combine emerging discoveries.

The Persistence to Game

Based on my observations in the physical education setting for 8 weeks, the students' experiences participating in active gaming can be summarized by suggesting

their participation was a "persistence to game." The students enjoyed active gaming and desired to remain engaged in the technology driven games. As the students walked into each active gaming session, they looked around the room pointing at the different games. When instructed, students would hurry to the activities and quickly become engaged in game play. They took advantage of a less structured environment by choosing characters and competition levels that met their competitive needs and when provided the opportunity they enjoyed selecting the games they played. Regardless, smiles were on their faces and laughter was often heard throughout the class while the students were gaming. The students were actively involved in peer interaction as they discussed strategies in the game, challenged one another, or assisted classmates while playing. Even when the students were not playing, they were engaged in their peer game play. It was as if I was in a room just watching and listening to kids play a variety of video games outside of physical education class.

Through observations I also learned the students were visibly non-compliant when asked to end game play. They demonstrated a consistent desire to want to be engaged in physical activity in order to play the games. As it came time to rotate or switch to a new activity, students were reluctant to quickly follow instructions. I observed students in the middle of game play trying to remain engaged even when the teacher warned them several times to move on to the next activity. In addition, when class time ended, the teacher had a difficult time getting the students to finish game play so class closure could occur. In addition to game play during physical education student interviews suggested a strong desire to participate in active gaming away from school. Some students even suggested they would engage in the games every day after school if

given the opportunity. As I watched the students laugh, smile, interact, play games, and engage in physical activity session after session, there was one clear characteristic of the students' experiences; active gaming was fun.

The "persistence to game" (P^2G) is defined as a natural characteristic of children to voluntarily engage and remain engaged in technology driven physical activities. Each of the students was consistently motivated to game play and remain engaged in physical activity while gaming during physical education.

A similar theory to P2G was suggested by Sanders and Graham (1995) when they suggested children have a relentless persistence to play when provided structured environments. Kindergarten students did not want to do exercises which were extremely structured so they continued to be off task finding other things to do. They participated more during game play and skill activities which were less structured. Sanders and Graham (1995) suggested when students are given an opportunity to play they will do whatever it takes to continue playing in a way that is individually acceptable or desired.

Based on the data, P^2G in the studied physical education environment can best be described as including eight elements. These elements are the attributes, that when collected together, make up the students' persistence to game. The elements of persistence to game include:

1. Fun
2. Opportunities for choice
3. Peer interaction
4. Peer and independent learning
5. Perpetual movement to be engaged
6. Reluctance to cease game play

7. Unremitting interest
8. Video game play motivation

Fun

Data analysis suggests fun was manifested when students participated in active gaming. Considering having fun was rated by 86.2% of adolescents as being the single most important element in life (Lindstrom & Seybold, 2003), this element suggests active gaming provides students with activities they enjoy. When students consider an activity to be fun, they are more likely to remain engaged or engage in the activity in the future (Robertson-Wilson, Baker, Derbinshyre, & Cote, 2003; Weiss, 2000). This is one reason why enjoyment is considered one of the most important characteristics of quality physical education programs (Wechsler, Mckenna, Lee, & Dietz, 2004). Having fun was certainly observed to be a major element in student's participation in active gaming during physical education.

During active gaming sessions, I observed each student having fun. The students' enthusiasm as they engaged in game play was evident through their verbal and nonverbal communication. I would often hear the students laughing, giggling, or squealing as they played the games. Fieldnotes even demonstrated students singing songs together during game play:

> Harris and his friend are singing together a rap song call "Sweet Life" (I think). They are singing in harmony and they emphasize "This is a sweet life" by singing the lyrics very loud and then laughing. At the same time, they are starring at the screen playing the game. Harris finished and said out loud, "I finished first" threw his hands up in the air, and then kept singing. His peer shook his head and kept singing as they started a new game.

In addition, big smiles were glued to their faces whether they were playing or waiting to play the games, and 'high fives' were a common observation during the sessions. The students never appeared bored or uninterested while participating in active gaming. In fact, they seemed excited whether they were actively engaged in game play or waiting their turn to play.

The students expressed to me that they enjoyed active gaming and believed it was fun. One student stated, "For me this room is just amazing…and it's just awesome, everything. I would have these in every single school, because the games they have here, the game room; it would get kids to have more fun. Like for PE, it's just fun too. But this one you just get their little minds going and just have fun." Another student commented, "I think it's awesome, because you're playing games and you're having fun." Students also suggested physical education was more enjoyable now that active gaming was a part of class. One student expressed, "I think it's better now that this (active gaming) is here." Another student agreed by saying, "PE is good the way it is but it's more fun with these games now."

Opportunities for choice

Active gaming in this PE environment provided opportunities for a less structured environment allowing participants to have more choices. Research suggests that self-paced, child-controlled play is the best way for children to optimally develop (Rogers & Sawyers, 1988). Children are more willing to express thoughts, feelings, and experiences when they have more choice and a voice in instruction (Dyson, 1995). If children are pushed by teachers or other external demands, they are more likely to resist the demand

(Koster, 2005). When children experience activities with fewer externally imposed rules and more choice, they are more likely to enjoy and remain engaged in the activity (Rogers & Sawyers, 1988).

During active gaming in physical education, the students were provided many choices during game play. The unstructured environments allowed them to choose the activities they played, how long they played them, and with whom they played. I observed some students choosing to repeat activities for extensive periods of time while others would play one game and quickly move to a new activity. As fieldnotes recorded, "Wilson has finished his second game on DDR and has gotten back in line to play again. He has chosen to play DDR the entire class period." When the students were allowed to select whom they played with, they would often show excitement by grabbing their peer while moving around the environment, choosing to play alone during certain activities and engaging in competition during other activities. Additional choices included the character in which to identify and the competition level in which they felt comfortable playing. During one experience, "Angela and Tammy are on the Dogfighters setting up their game. Angela said, 'what level are you going?' Tammy said, 'Me? I am going easy level.' Angela responded, "You go easy but I think I will try this moderate one first." It was obvious that providing the students with more choice did not create an unorganized or off task learning environment; this less structured environment may have actually fostered a more enjoyable and successful active gaming experiences.

Students expressed a desire to participate in an environment with fewer externally imposed rules. The students suggested the more choices they had the more enjoyable their experiences were during active gaming. One student made a clear summarization by

saying, “I would go to this game, and once I get tired of this game, move on to another game. And when I get tired of each game, I go to a new one. And I would be with partners I choose because it’s more fun.” Another student suggested, “I would let them pick their game, and the group goes to their game. I don’t know, I think it’s better. If I don’t like that game then they don’t want to play it. Let them go to the one that they want, do the exercise game, and then they’ll have fun.”

Peer interaction

While the students were participating active gaming, social peer interaction was present. For voluntary physical activity to occur, children suggest the activity needs to be enjoyable and in a social environment (Robertson-Wilson et al., 2003 Weiss, 2000). In physical education, when experiences meet students’ needs for success in a social environment, future participation in physical activity is encouraged (Robertson-Wilson, et al., 2003; Weiss, 2000). The students in my inquiry chose to participate in peer interaction while playing the active video games. Regardless if they were able to choose their partners, play independently, or were assigned a partner or group, the students were consistently involved in social, peer relations. Students would discuss strategies and instructions about the game, engage in competitive conversations, or simply make random remarks.

Peer interaction was evident during each active gaming session. Students were engaged in conversations with one another during game play. Some conversations discussed various strategies during the game. For example, during one experience participating in active gaming, fieldnotes captured two students working through strategies in a game, “The girls are smiling and laughing playing Batman and Robin.

They are talking back and forth about strategies in the game. “I’m up here now” Ashlyn said. The teacher told Angela to go help Robin. Angela said, “I’m trying to help but she keeps going over there and I can’t get over there.” Ashlyn replied, “I didn’t know you can’t get there. I will come back. Just wait on me.” Angela said, “Ok, but see that (pointing at the screen, don’t go there. Go this way because…” Other discussions were obviously focused on the students competing against one another. I often heard competitive remarks such as, “I am better than you”, “bring it on”, “I beat you”, or “will you versus me” while observing the students. The following excerpt from fieldnotes demonstrates one competitive game play experience:

> Wilson and another girl are challenging one another on DDR. This is the girl that Wilson told me had beat him before. The entire rotation they are challenging one another. Right now they are waiting behind the pad singing to “Get Busy” and practice stepping. Wilson and his peer are on light mode and play the same song. She got a C and he got a D. Wilson just smiled and said, “Ok, 2 to 1. I will beat you next time.” Wilson is back on against his peer this time choosing to play Standard mode. They both are not doing great. The lights go off to finish up for the day and they continue stepping until they finish their song. Looking at the score he says to her, “yeah, I won.” She said, “no we both got an E”. Wilson said, “no, look at the actual score, right here” as he was pointing to the number score. She said, “oh, ok”. Wilsons said with a huge grin and sense of accomplishment, “yeah, 3 to 2, I won”. She said, “I’ll get you Monday” and sat down quietly.

When students were not discussing strategies or engaged in competition, they were typically commenting on each other’s game play. Sometimes I would hear the students get excited about their peer accomplishing something “cool” in the game such as “catching a rail” on the XrBoards while snowboarding down a mountain or knocking out an opponent during Xavix Boxing. Even when students chose to play games independently, other peers were often watching and commenting during game play, or

they would ask to join the game and play with the peer. For example, one student had been playing 3 Kick with a peer and decided to move to the GameBikes. There was no other student on the GameBikes so he set his game to single player and began playing. In the middle of this student's game, a peer I had not seen him interact with sat on the other bike and said, "Will you restart your game so we can play each other?" The student immediately stopped game play and said, "Sure, I am going to beat you anyway" as he grinned and reset the game to multiplayer.

Students certainly believed active gaming involved peer interaction. One student commented about active gaming being social by saying, "We socialize on what game we want to play and we get along. If we don't get along we just talk about it, or just calm down and talk about where we really wanna (want to) go… I'm talking about the game like, 'Oh this is so fun!' Then, when it's done I say, 'Oh I either beat you or you beat me'." In addition, the teacher agreed that social interaction with peers was not only desired by the students, but it was important for the students to experience in order to continue to want to engage in the activity. She suggested, "…But, um again the point being, you want it to be fun. If they're not talking to their friends then they might not be having fun. The whole point is to make it a social experience and so that it is something they want to do with their friends, therefore they are more likely to do it."

Peer and independent learning

During active gaming, learning experiences often occurred both through peer assistance and from independent exploration of the activity. Children enjoy video games and also enjoy being engaged in 'exploration' of these games in the social environment with others. However, they may reach a stage where they may need assistance from a

more competent counterpart to advance their skills. This assistance is referred to as scaffolding (Vygotsky 1978). Beck and Wade (2004) suggest that this generation prefers to learn from the game or from one another, not their elders as they are not as motivated by authority figures' demands. Peer scaffolding offers a great opportunity for social interaction and leadership roles to emerge. In addition, at the Summit on Educational Games, 2006, it was suggested "games and simulations can offer scaffolding, providing learners with cues, prompts, hints, and partial solution to keep them progressing through learning, until they are capable of directing and controlling their own learning path" (p.19). In this sense, the video game itself becomes the guidance needed for children to further develop skills as they learn to use the tools provided on the screen to enhance their level of play. Students participating in active gaming would engage in game play and explore the game independently in order to learn how to play; using the video game as a scaffold.

Although the teacher briefly discussed the learning objectives at the beginning and end of class, she was rarely involved in the students' learning process during game play. Students worked independently or with peers to progress and find success while participating in active gaming. When asked, the students suggested they would rather learn from the game or from a peer rather than from a teacher or another adult when participating in active gaming. The students would often spend time reading the instructions on the screen and exploring in the game in order to learn while playing. As a student stated, "I'd rather figure it out myself, because I did it without the adults and can probably learn more stuff without them. " Another student demonstrated learning through the game as she played a game that she had never played before. I walked up to

her and asked, “What is the goal of this game?” While continuing to step she said, “You try to kill the bad guys; that’s what you are suppose to do. I pointed at Batman and said, “Who is that,” and she said, “That is batman and he is in his demolition suit which means you can blow up stuff. I said, “How did you know that” she said, “because it tells you things like that right here” pointing at the bottom middle of the screen.

Independent learning also occurred through the students learning how to resolve technology problems. At various times during the sessions, I also observed the students having difficulties with the game technologies that required minor troubleshooting. Sometimes students would be playing and the screen would freeze. They quickly learned to restart the game on the controller or ask the teacher to restart the game on the console. I watched and listened to the students discussing what to do and trying to fix the game by pressing buttons on the remote. One student simply said, “Just wait and stop moving, I will just restart the game like this,” (pressing restart on the menu screen). The peer watched and the game was quickly restarted. Another student experienced technological difficulties while playing a game; yet, decided to troubleshoot the situation herself. “During the DDR game Ashlyn said, “It’s not working for mine.” She was referring to the pad not working or the censor on the DDR game. After the game she looked straight down to the wire connecting the pad to the console. She then looked at her partner’s wire that was securely connected to the pad and said, “Oh, that’s why.” She smiled and reconnected the wire and said, “Mine’s working now – its cause mine was loose.”

In addition to learning independently, peer assisted learning was demonstrated while the students’ participated in active gaming. As one student mentioned, “I would pick the peer to learn. They would tell me the way I need to know.” Students would

discuss game strategies and assist one another in how to play the game. One student, Harris, was at DDR talking with his peers about the different songs. They were trying to find a faster song on the basic level. Harris's peers were randomly choosing songs and listening to them trying to determine if they were too fast to play. They did not understand how to tell the BPM (beats per minute) for each song by looking at the screen. Harris quickly spoke up and helped the other boys realize which songs were faster by pointing out the BPM segment on the screen. Another experience with peer assistance was evident when two students were playing on the Dogfighter game. Joey was helping Wilson set up the game. Joey said, "Wilson, press fire. Do you want moderate or easy. Go easy". Wilson just listened and followed instructions while smiling. Joey then showed an adult that was watching there was an eject button. Pointing at it he said, "I thought it wouldn't really do this (eject) but it does. It really works. It is so cool."

Perpetual movement to be engaged

Data from my inquiry showed students consistently desired to engage in an active game. In many traditional physical education classes, students are not excited to participate in the activities and act as a competent bystander (Tousignant and Siedentop, 1983). The term - competent bystander - is used to describe students that are competent at not responding to an activity without drawing the teacher's attention. Competent bystanders act like they understand the lesson and pretend to be on task; however, this behavior is false and often misunderstood by the teacher. No competent bystanders were observed during active gaming in physical education class. When provided an opportunity to play, students chose to participate in the games regardless of the physical activity involved. I observed all students on task being physically active when possible.

In fact, the students suggested playing the active games made "exercise more fun" and they often "did not think about exercising." One student was stepping quickly on Gamercize while playing Batman and Robin with a peer. I asked her if the game was fun and she nodded her head in a forward motion while saying, "Yes" and then continued, "I love this game." I then asked her if she thought about having to step and she replied, "Not me. I don't think about it at all cause I am just playing. It does not bother me."

I discovered a desire by students to be actively involved in the games as opposed to waiting and watching others play. When working in groups students were often requested by the teacher to take turns playing the games. If provided the opportunity, students would move to play an open game instead of waiting with their group as instructed. For example, during one rotation, the boys went to the Wii station where Joey and Wilson played and Harris was waiting and watching. As fieldnotes stated, "Harris tried to go to Xavix boxing since it was open assuming he did not want to wait to play; however, he was quickly told by the teacher he needed to stay with his group. He apologized and quickly walked back where he watched his partners and continued to talk through the game with them." When the students were waiting to play, although they were involved in watching their peers' game play, students would make comments to their peers saying, "Hurry up so I can play," or "Are you almost finished, I want to play." The students would even demonstrate frustration if others were still on games that they were supposed to be playing. During one experience, a peer was still playing Nintendo Wii when he was supposed to rotate. When a student arrived at the Wii station she said, "Hey, get off it's my turn to play. You have to go now" as she walked in front of the

screen and reached for the remote control the peer was holding. These students were clearly not competent bystanders.

Reluctance to cease game play

While participating in active gaming it was apparent the students were reluctant to cease game play. When the students were signaled to rotate to a new station or stop game play at the end of class, they were disinclined to follow instructions. The students would either not listen to the teacher's instructions, or were so occupied in the game they did not hear her instructions.

Fieldnotes suggested that "the students were not rotating," "the students were hesitant to end their game," or "the students insisted on finishing their game before rotating." I observed these behaviors while the students were participating in game play on many occasions. It was obvious the students did not want to stop in the middle of playing a game to move to another activity. Fieldnotes also noted that the students who rotated were becoming frustrated when others were not rotating on time. I often heard comments from the students such as, "Just hold on I am almost finished," "How is the time already over?," or "Hurry up and let's just finish first.." During one experience recorded in fieldnotes, "Tonya continued playing DDR after Leslie had turned out the lights. Tonya was obviously trying to finish her game before rotating. She started to get off and then kept stepping back on the mat in front of another peer that jumped on to play. Tonya then went to the side of the mat and continued watching and stepping to the arrows until the song went off. When the song was finished, she rotated to the Wii station."

The teacher had to address the class several times to get the students to end game play for class closure. As reported in fieldnotes during one class, “The lights go off and the boys stay on the XrBoards because Wilson and Harris had just started their game. Then Leslie walks closer to them and they step off still looking at the screen. They sit and Leslie says to the class, ‘I am trying to let you play up until the very end as you can see but you have to cooperate at the end.”” Even after this experience the students demonstrated continued reluctance to cease game play. I observed a situation where some students were called to leave the classroom early. When the teacher instructed the students to finish their games immediately and lineup, several continued to play. When the students in line began to walk out the door, the students were still engaged in game play. A peer happened to walk by the opened door to the game room and peaked his head. He saw a one of the students still playing and yelled, “Harris, yo, come on.” Harris hesitantly looked up, jumped off the GameBike and ran out the door behind the line of students. The other students quickly followed.

Unremitting interest

I learned through data analysis that the students’ interest participating in active gaming was unremitting. The students were engaged from the beginning to the end of each class as well as throughout the eight week inquiry. In addition, students suggested they were interested in participating in active gaming away from the school environment. This element of unremitting interest is significant because the recommended about of moderate to vigorous physical activity, 60 minutes daily (NASPE, 2006), is not being met by the majority of children (CDC, 2006). However, it is known that students are more

likely to voluntarily engage in an activity if they consider it interesting and enjoyable (Robertson-Wilson, et al., 2003).

Students were actively engaged in active gaming from the beginning to the end of each session. I did not witness students who wanted to stop class or who appeared relieved when class ended. In fact, the students were smiling, laughing, and enthusiastic throughout each class. Students' comments and researcher observations at the end of the inquiry suggested students enjoyed participating in active gaming as much after eight weeks as they did when they started. One student said, "Well, during all those 8 weeks it has been the best days of my life and it's like I've never experienced anything like this before." Another student shared similar feelings when he said, "The past 8 weeks were the best gaming experience of my life, and it was so awesome, and I loved all the games and room… I wouldn't change anything because that room is the best game room in the entire universe. That room is awesome I would love if my house had that exact game room in my house." Some students believed active gaming was more enjoyable by the end of the eight weeks because they were able to learn the games and experience more success with the games. As a student commented, "It's a lot better! A lot better. Really fun. Now that I got to play all the games and I know what they are like. And they're real fun. Real fun."

The teacher supported the students' statements and believed they remained enthusiastic when playing the active games during the eight weeks. She reported," I think the students really enjoyed the active gaming. Their excitement was evident in their voices and facial expressions. The six selected students all seemed to be thrilled with the

games. In general the class behaved well and I do think that the high level of motivation to participate in the activity contributed to that."

The students' continuous interest participating in active gaming during physical education class was evident; yet, they also reported a desire to engage in these activities away from school. Students suggested having the opportunity to participate in active gaming away from school would encourage them to be more physically active. As students stated, "I would choose to go everyday just in case I feel lazy that day and the active gaming will get me off my feet,' and "I will often do so because I love getting active and not being lazy so probably 2 hours or 5 hours per day. Students suggested they would voluntarily participate in game play as much as possible. One student said if he had active games at home he would choose to play, "Always! Even every day after school." Another student agreed by saying she would participate in active gaming, "A lot of time, like I'm going to wake up and eat then play before I take a shower. I'll be in the game room from 9:00 in the morning until late at night."

Video Game Motivation

The video game component in active gaming was clearly a motivation for the students' engagement and enjoyment in my inquiry. Active gaming research supports this element by suggesting the video gaming is enjoyable and provides a motivation to exercise (Widan McDonald, and Abresch, 2006). It is evident that children enjoy video games as 83% of American children between the ages of 8 – 18 have one or more video game consoles and spend on average 49 minutes per day playing these games (Foehr, Rideout, & Roberts, 2005). Video games are intriguing to children because they deliver a sense of 'reality' through entertaining technologies that are able to capture children's

attention because the games respond to the player, reward technical skills, and allow players to escape from boredom (Beck and Wade, 2004).

While I was observing the students in the active gaming environment, they were visibly motivated to participate and remain engaged in the activities during each session. When I asked the students to share with me through interviews and journal entries why they enjoyed active gaming, the consistent response highlighted an enjoyment of playing video games. One student made a simple statement about why he enjoyed active gaming by saying, “All kids play video games” (while he smiled and shrugged his shoulders). Other students believed being able to participate in video game play made their physical education experiences more enjoyable. As one student stated, “I think that it’s amazing because it’s the first time that I’ve seen anything like this. A lot of children that I know, like, a lot of children that I know like to play games like this. A lot of these games, I don’t really know of. But I like to play them, because it tends to be that I like… Like three kick; I didn’t know three kick was invented. So as soon as I tried it was fun...because it’s just fun. Videogames in your school is fun.” Another student added, “Sometimes our PE (pause), some people think it’s boring. And when they play games when they’re exercising they think it’s fun. So that’s why active gaming is here.”

Not only did the students enjoy the video games, but they were also able to make a distinct connection between the video games and exercise suggesting the videogames made physical activity more enjoyable. As one student stated, “I think it’s (active gaming) awesome, because you’re playing games and you’re having fun, but you’re still doing physical work.” Another student suggested, “I feel really good. This is a wonderful

opportunity to play games at the same time you are working out. I feel all worked out because these games give you all types of exercises." Other students agreed:

> Active gaming is like you play and you exercise at the same time. It's kind of weird because I thought video games were for fun not exercise. They're both now.
>
> I feel excited on Mondays' and Tuesday's when we go to the games room. But I also feel exhausted when we leave the game room.
>
> I really, really love it. I get energy and I also get active with the machines. It is the best that happened to this school

Discussion

Children are naturally inclined to play. Play is something children believe is fun and enjoyable. Although play is sometimes stereotyped as frivolous, researchers consider play as an important element in life to achieve optimal development. Although the concept of play may remain consistent, the way children engage in play continues to evolve due to the ever changing culture in which children live. Piaget defines one type of play as game play. Traditional game play has been expanded in this study to include technology games and specifically video games. Although many may continue to doubt the use of technology in fostering cognitive play experiences in children, researchers are beginning to understand new forms of play using computer software can provide children with beneficial play opportunities (Johnson et al., 2005). Universally, play is considered intrinsically motivating – a child does not need to be directed to play.

While participating in active gaming, the students demonstrated a "persistence to play games," a voluntary desire to engage and remain engaged in technology driven physical activities. The students were intrinsically motivated to play the videogames. Similar to

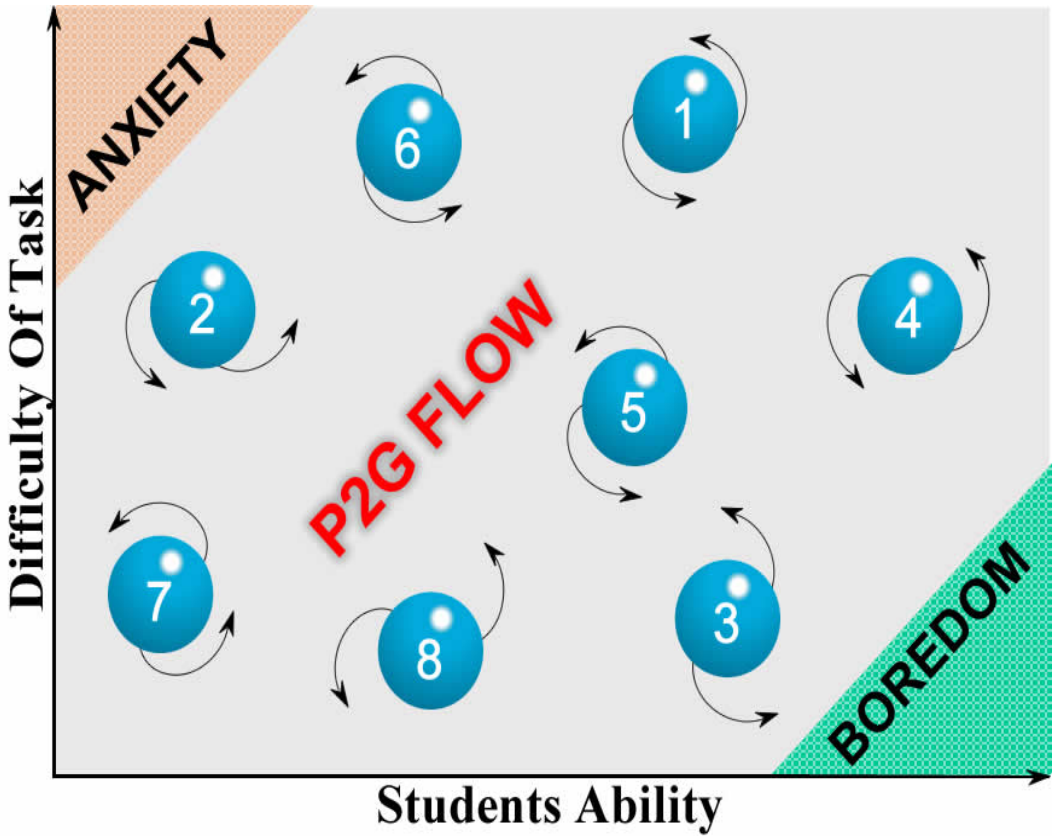
play experiences, research suggests students who are intrinsically motivated to perform a task often experience "flow" (Aultman et al., 2005). Csikszentmihalyi (1975b) believed that people are most happy when they are in a state of flow or "the zone" with a particular activity. The flow state is defined as an optimal state of intrinsic motivation, where a person is fully immersed in what he or she is doing. An important precursor to a flow experience is a balance between the individual's skill level and the challenge of the task. If the task is too difficult or becomes frustrating, the individual may experience anxiety. If the task is not challenging enough, boredom may result. In addition to finding a balance between the individual's skill level and the challenge of the task, Csiksentmihalyi (1975a, 1975b) theorized a eight other components of flow. Csiksentmihalyi (1975a) suggested not all nine elements had to be present in order for a flow experience to occur. However, most of today's video games incorporate all components (Chen 2007).

The students participating in active gaming during physical education class were certainly in "the zone" or flow while demonstrating a persistence to game. The eight described elements that encompass P^2G were found to be present when the students participate in active gaming (Figure 10). More elements may be included but were not found in this inquiry. The P^2G flow zone is visibly wider in this model than in Csikszentmihalyi's original model suggesting that the students were in flow more often than they were out of flow. Students during P2G rarely experienced extended periods of anxiety or boredom. Anxiety was observed when the students were reluctant to end game play in order to rotate to a new activity or for class closure. In contrast, boredom was only evident when the students had either repeated and activity multiple times and decided to rotate, or when the students had to wait to play an activity. Although all eight

elements were present at various times in my inquiry, not all elements were present simultaneously. For this reason, the eight elements highlighted in the model should be envisioned as being in continuous motion.

The eight elements in motion simply suggest the students' experiences while participating in active gaming would change depending on the attributes that were present at the time. For example, during some active gaming experiences I observed the students engaging in peer interaction, learning through peer scaffolding, and engaged in the video game while being reluctant to end game play. I would not necessarily observe the students experiencing a perpetual movement to play the games. During other experiences, I observed students' perpetual movements towards the activities while choosing to play independently. In this situation, the students did not necessarily experience peer interaction or peer learning. Two active gaming occurrences with different P2G elements; yet, both created flow experiences for the students. Additionally, the students may initially choose to play alone; however, when the opportunity to engage in peer interaction presented itself, the students would adjust to this element and remain in flow. As fieldnotes suggested, Wilson is playing 3 Kick alone. He is setting his game to 30 seconds each time. A peer just walked over and jumped in the game with Wilson. Wilson does not seem to care as he continues playing and has a smile on his face. When the buzzer sounded for the game to end, Wilson and the peer smile at each other and the peer said, 'Want to play again?' Wilson shakes his head and the peer resets the game to 30 seconds." Although not all elements were necessarily present at the same time, all eight elements were observed during the students' experiencing participating in active gaming during my inquiry.

The P2G Flow Zone represents the students flow experiences while participating in active gaming during physical education class. The eight described elements are the attributes that create the flow experiences as those elements interact during participation in active gaming. The wide "flow" zone in the model signifies that the students were in flow the majority of time while playing the active games.



The Eight Elements of P2G

1. Fun
2. Opportunities for choice
3. Peer interaction
4. Peer and independent learning
5. Perpetual movement
6. Reluctance to cease game play
7. Interest is unremitting
8. Video game play motivation

Figure 10: Persistence to Game (P2G) Flow Chart and Eight Element Key

Summary

This chapter described the Persistence to Game discovery generated by the elements developed from the students' experiences while participating in active gaming.

In addition, a model illustrating the students' P2G was suggested and described based on Csikszentmihalyi's Flow theory.

Chapter 6

Conclusions, Implications, and Suggestions for Future Research

This chapter summarizes the purpose of the study, the data collection methods employed during the investigation, and the discoveries. Implications are presented along with suggestions for future research.

Summary

National organizations are calling childhood obesity an epidemic (CDC, 2006) one that needs serious attention. It is suggested that physical activity levels decline throughout the lifespan (Caspersen, & Meritt, 1995), and a significant decrease in physical activity levels occurs during adolescent years (Caspersen, Pereira, & Curran, 2000; Van Mechelen, Twisk, Post, Snel, & Kemper, 2000). Although it is recommended children acquire at least 60 minutes of physical activity daily (NASPE 2004; AHA 2007), the majority of children are not achieving this goal (NASPE 2006). One major cause for the decline in physical activity in children is the reduction in physical education in American schools (Davis et al., 2006). Only one-third of states require physical education for elementary and middle school students according to a new report by NASPE and the American Heart Association (Dotinga, 2006).Unfortunately, 65% of children ages 9-13yrs. report that they are not physically active outside of school hours (Davis et al., 2006) indicating the importance physical education may play in providing opportunities

for children to engage in daily physical activity. Another significant cause of the increasing rate of childhood obesity is the expanded use of technology. As technology continues to develop, children are spending more time engaged in sedentary activities such as computer use, video game play, and television viewing. American society is being referred to as a "screen-based" culture due to the amount of time individuals spend with technology involving screens, especially video games. Children spend approximately 49 minutes per day playing video games (Foehr, Rideout, & Roberts, 2005), time that in the past was spent being physically active. Active gaming is an emerging concept that involves participating in physical activity while playing video games. Participants must be physically active in order to play the games. It is important to note that if children enjoy and desire active gaming as part of their physical education classes they are more likely to want to participate and learn new motor skills (Weiss, 2000; Robertson-Wilson, Baker, Derbinshyre, & Cote, 2003). The ultimate goal is to increase voluntary physical activity levels in adolescents. The primary purpose of my inquiry was driven by those thoughts and explored the experiences of six fifth grade children as they participated in active gaming during physical education classes.

To assist in answering these questions, I collected data on six fifth grade children while participating in active gaming during physical education classes for eight weeks in the spring of 2009. Specific techniques I used to gather data included observational fieldnotes, interviews, and journal entries.

I observed the six selected students each time they participated in active gaming during physical education class for eight weeks (16 consecutive classes) for 30 minutes each session. Each class was videotaped for subsequent review as part of the data

triangulation process. In addition, fieldnotes were recorded during each observation. At the conclusion of each class, I reviewed the fieldnotes and videotapes in order to draft a detailed description of what occurred during the physical education class. In addition, I reviewed the fieldnotes recorded by a research assistant and drafted a description of the experiences of the six children.

I also collected data through teacher and student interviews. Interviews centered on reflective and probing questions to assist in learning the teacher's insights on the children's active gaming experiences and on the children's personal experiences during active gaming. I interviewed the six children in pairs for 15-20 minutes on three separate occasions. In addition, the physical education teacher was interviewed on three separate occasions. All interviews were videotaped and audio recorded and transcribed for analysis.

A description of the physical education active gaming curriculum was drafted from the data sources. Descriptive profiles of the six children and the physical education teacher were compiled from the observational fieldnotes, interviews, and the videotapes.

Many themes describing the children's experiences while participating in active gaming were then developed from the analysis of data sources. I analyzed the generated themes and subsequently a number of those these were eliminated and many combined to produce one confirmed theme detailed as the discovery of this study.

Discovery

From the data collected during my inquiry one major theme, the Persistence to Game, was derived from the students' experiences participating in active gaming during

physical education classes. The data suggested eight elements or attributes make up persistence to game. Following is a brief summary of persistence to game.

Persistence to Game

The "persistence to game" (P^2G) is defined as a natural characteristic of children to want to voluntarily engage and remain engaged in technology driven physical activities. P^2G can best be described as including 8 elements. These elements are the attributes, that when collected together, make up the students' persistence to game. The eight elements are: 1) Fun, 2) Opportunities for choice, 3) Peer interaction, 4) Peer and independent learning, 5) Perpetual movement to be engaged, 6) Reluctance to cease game play, 7) Unremitting interest, and 8) Video game play motivation. These eight attributes assisted in creating flow experiences while the students were participating in active gaming.

Implications

Active gaming experiences as provided in physical education class are new to most students and teachers. However, over the past 10 years active gaming has grown exponentially and is quickly becoming one of the most popular leisure physical activity outlets for children. This trend might suggest that in the next 10 years a large number of school systems will have active gaming facilities as part of their school physical education program. Based on the data from my inquiry, six major implications are suggested: 1) Create play-like environments, 2) Cultivate the element of fun, 3) Foster individual and peer learning, 4) Explore the role of the physical education teacher, 5) Incorporate out of school programming, 6) Prepare teachers.

Create play-like environments

Based on the data of my inquiry, physical education teachers should establish active gaming curriculums based on "play-like" environments. Play theorists suggest that children at play are intrinsically motivated to participate in the activity. The students participating in active gaming reported they desired to participate in the activities and wanted to continue game play. Research also suggests that playing, including playing with technology in the form of games, promotes learning and additional cognitive benefits in children. While playing the active games, the students in this inquiry demonstrated learning independently through exploring the game and via peer scaffolding.

In addition, the students in this inquiry suggested an environment that provided them with more choices, and less structure with fewer rules from the teacher was preferred. The students experienced moving around the active gaming room in a structured, semi-structured, and open-structured environment. Having more choices created positive, successful experiences. Based on this discovery, teachers should consider creating play-like learning environments when students are participating in active gaming.

Cultivate the element of fun

This study suggests active gaming was fun and students aspired to participate in the activities because they were enjoyable. As a result, implementing active gaming in Kadia Elementary School's physical education program encouraged students to want to be and remain engaged in physical activity. As suggested in the data active gaming

activities were naturally motivating and fun. This discovery implies the necessity for physical education teachers to consider creating active gaming environments that focus on the element of fun in order to encourage self-motivating experiences.

Foster individual and peer learning

Furthermore, the students' suggested they preferred to learn independently when exploring the game and that this learning should come from a knowledgeable peer rather than an adult or teacher. This discovery suggests teachers should consider what the most effective strategies are for individual and peer scaffolding to occur and create active gaming environments that allow students to learn independently via exploration or from more educated peers. For example, teachers should create lessons that encourage students to assist one another with learning objectives as well as independently through the game. In addition, maybe the older students become the teachers for the younger students; the fifth grade students at Kadia Elementary are now experienced and can teach the 2nd or 3rd grade students how to play active gaming activities.

Explore the teacher's role

The students believed the teacher's main role in active gaming was for discipline control not necessarily to help students learn new content. Although this discovery should not be generalized to all active gaming environments, it is appropriate to consider what the teacher's role may be or if a teacher is even necessary in the active gaming environment. Should students receive instructions via computers and participate in active gaming independently or without teacher guidance? Should the teacher become more of a facilitator for the students? It may be that active gaming technology will serve as a

conduit for increased learning and physical activity and that the role of the teacher in the teaching/learning process in this environment will change dramatically.

Incorporate out of school programming

Students suggested a desire to participate in active gaming outside of physical education class. If this is true, schools may want to consider including an active gaming room that incorporates before and after school programs, as well as weekend and summer programs in order to provide students with increased physical activity opportunities.

Parent involvement with providing activity gaming environments at home may also be a positive movement to increase daily physical activity. Teachers should be able to educate parents on how to incorporate active gaming at home including the cost and effectiveness of the activities.

Prepare teachers

If active gaming is going to become a part of university physical education curriculums, University physical education teacher preparation programs (PETE) must prepare to provide training and education to beginning teachers on curriculum and instruction strategies and assessment processes in an active gaming environment. NASPE has accepted the concept of active gaming being incorporated in physical education programs and is currently developing developmentally appropriate practices for PETE programs (Mears, Hansen, Fine, Lawler, & Mason, 2009). It is necessary that PETE programs realize active gaming can be an effective 21st century technology tool and should be adopted as part of their curriculum and instructional strategies when preparing teachers.

When implementing active gaming in PETE programs, the cost of the equipment should be considered. Active gaming facilities can be expensive and may not be reasonable to employ in all school systems or university settings. If funding is not available for a full functioning active gaming facility, acquiring several active games to include in teacher preparation may be sufficient if implemented appropriately. Regardless of how many active gaming activities are available in a PETE program it is important for teacher educators to understand the value active gaming has in the physical education curriculum. Active gaming should be considered a tool which teachers use to accomplish learning objectives. Therefore, active gaming may be incorporated into the method courses associated with the PETE program. It is not the responsibility of PETE programs to understand how each active game available operates. However, it is important for PETE programs to assist future teachers in understanding the role active gaming plays in the physical education classroom and the best teaching strategies associated with implementing these activities. Cost of the equipment, space required, and setting up the environment to maximize participation are a few ideas teacher educators should be prepared to share with future teachers.

Suggestions for Future Research

My inquiry contributed to the limited amount of research conducted not only on student's experiences in active gaming during physical education classes, but also on students experiencing outside the physical education environment. This study helped to provide a foundation for future research which may include: 1) Explore developmentally appropriate teaching strategies, 2) Investigate Flow theory as it relates to active gaming, 3) Peer learning, 4) Determine the physiological effects of participating in active gaming,

5) Conduct a longitudinal studies exploring student experiences in active gaming over time, 6) Explore how teachers' process and use information in an active gaming environment, 7) Further investigate gender experiences during active gaming.

Explore developmentally appropriate teaching strategies

Based on the discoveries of this inquiry, students believed the teacher's role was discipline control not teaching learning objectives. Future research needs to explore developmentally appropriate instructional strategies for use during active gaming. What should be the role of the teacher during active gaming? How does the teacher's role in this setting influence student learning? Should learning be administered through more sophisticated technology instead of a teacher? Should teaching environments be free of externally imposed rules? Should teachers take on more of a facilitator's role? These questions amongst others should be investigated. This research should be conducted for all age levels elementary through high school.

Investigate Flow theory as it relates to active gaming

Another recommendation would be to study how the theory of flow outlined by Csikszentmihalyi (1990) relates to active gaming. The current literature does not provide any evidence about flow theory and active gaming. It would be interesting to determine the level of flow students may experience and how long they remain in the flow zone while participating in active gaming.

Peer learning

In addition, further research should be conducted which investigates how children learn from their peers in an active gaming environment and what the most effective teaching methods may be to foster peer learning. It is obvious from this study that fifth grade children participating in active gaming prefer to learn from peers rather than a teacher. Other age groups may or may not desire to learn by interacting with their peers. Research in active gaming dealing with working with a partner and small groups is needed with all age groups.

Determine the physiological effects of participating in active gaming

Research based on determining the physiological effects active gaming has on students should be considered. This information is needed in order to learn if these physical activities are providing students with a physical benefit in terms of heart rate, blood pressure, Vo2, etc. NASPE suggests students obtain at least 60 minutes of moderate to vigorous daily physical activity. This research would also assist in understanding if active gaming provides students with an appropriate level of fitness.

Conduct a longitudinal study exploring student experiences over time

Another investigation might take the form of a longitudinal research effort. The primary purpose of that study would be to determine if and how students' experiences and feelings about active gaming during physical education change over time. Another purpose of this study may be to understand the sustainability of active gaming with students in physical education. This knowledge may assist teachers in understanding the

best instructional strategies to employ for different age groups in the active gaming environment.

Explore how teachers' process and use information

Although the research literature in active gaming is in its infancy stage, further research exploring how teachers' process information about students' experiences participating in active gaming during physical education would provide unique insights. It is critical that physical educators understand students' experiences and feelings about active gaming when they develop physical education curriculums. It would be interesting to learn to what extent teachers currently use the knowledge of student's experiences and perceptions in designing active gaming leaning activities.

Further investigate gender experiences

This study explored three girls and three boys' experiences while participating in active gaming during physical education classes. Although this study resulted in no significant findings based on gender experiences with the selected participants, gender experiences during active gaming participation do deserve further investigation. Are there differences in the way boys and girls participate in active gaming activities? Are their activities that are more or less popular with boys or girls? These questions as well as others deserve further investigation.

In conclusion, investigating student experiences while participating in active gaming during physical education class is an elaborative process. It is evident that additional studies using both qualitative and quantitative methods are needed. It is apparent that this generation has a strong desire to play video games and this desire

influences the way students feel about active gaming experiences in physical education. Through the establishment of technology based committees, workshops, and presentations, NASPE has recognized the importance of learning more about active gaming and how to implement these activities effectively in physical education settings. With this said, ten years from now active gaming facilities may clearly be a part of every physical education program in the country. Active gaming is not a fad, will continue to grow in popularity, and certainly deserves further exploration.

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Appendices

Appendix A.1: Student Interview Questions – 1st Interview

1. What does exercise mean to you?

2. Tell me about your physical education class before this week.

3. You have now participated in active gaming two times in physical education. Tell me about your experiences.

4. How do you feel about active gaming in physical education?

5. Were there any games you did not enjoy? Why did you not enjoy them?

6. You were able to play many different activities and games in the active gaming room this week. Tell me some of the active gaming activities you like and tell me why.

7. Pretend you are the physical education teacher, tell me how you would use active gaming in your class? How often would you use it?

8. How often would you like to play active gaming at home or away from school?

9. What do you think the benefits are of active gaming?

10. Is there anything else you would like to tell me or share with me about active gaming?

Appendix A.2: Student Interview Questions – 2nd Interview

1. You have been participating or playing in the active gaming room for 4 weeks in physical education. Tell me how you feel about active gaming.

2. You have now played all of the active games several times. Tell me some of the activities you enjoy and please tell me why.

3. Are there activities you do not enjoy and if so, tell me why?

4. How do you feel about active gaming as part of your physical education class. Why?

5. If you were the physical education teacher, how would you use active gaming in your physical education class?

6. If you could participate in active gaming at anytime including away from school, how often would you like to participate in active gaming?

7. How do you feel about active gaming being a type of exercise?

8. Tell me how you like working on the equipment best? Partners? Choosing your games? Why?

9. Why do you think active gaming is a part of your physical education class? Do you think it should be?

10. Is there anything else you would like to tell me or share about active gaming?

Appendix A.3: Student Interview Questions – 3rd Interview

1. You have now participated in active gaming for 8 weeks in your physical education class. Tell me how you feel about active gaming.

2. You are familiar with all of the activities in the active gaming room at this point. What are your favorite activities? Why?

3. Were there any games you did not enjoy? Please tell me why?

4. Try to think back to when you participated in physical education class and active gaming was not a part of the class. Discuss how you feel about physical education now that active gaming is a part of the class.

5. If you had to choose between PE with active gaming, without active gaming, or a combination of both, what would you choose? Why?

6. How would you include active gaming in your school schedule each day?

7. How often would you like to participate in Active gaming away from school?

8. In your own words, tell me what you think exercise is?

9. You have been participating in active gaming for 2 months or 8 weeks at this point. What have been the outcomes of it for you? Why?

10. Is there anything else you would like to tell me about active gaming?

Appendix B.1: Physical Education Teacher's Interview Questions – 1st

1. Tell me what your perception of active gaming was before you implemented it in your classroom.

2. Tell me about your students' initial experiences with active gaming after the first week of implementing it with your fifth grade class.

3. After this first week, tell me what you like about active gaming in your physical education class What do you dislike?

4. What kind of experiences do you feel your students are receiving from participation in active gaming activities during physical education?

5. How do you perceive girls are experiencing active gaming?

6. How do you perceive boys are experiencing active gaming?

7. Discuss any thoughts about your students participating in active gaming you may have at this point.

8. How do you feel about active gaming being a compliment to traditional physical education activities?

9. How do you feel active gaming activities can impact your students?

10. Which active gaming activities do you feel your students will enjoy most and please tell me why?

11. Which active gaming activities do you feel your students may not enjoy and please tell me why.

12. How do you feel about active gaming activities in physical education?

13. Is there anything else you would like to tell me about active gaming?

Appendix B.2: Physical Education Teacher's Interview Questions – 2nd

1. Tell me how you feel about active gaming after the first four weeks of implementing it with your fifth grade class.

2. Tell me why you like using active gaming in your physical education class. Why do you dislike using it?

3. What kind of experiences do you feel your students are receiving from participating in active gaming activities during physical education?

4. How do you perceive girls are experiencing active gaming?

5. How do you perceive boys are experiencing active gaming?

6. Discuss any thoughts with using active gaming in your classroom.

7. How do you feel about active gaming being a compliment to traditional physical education activities?

8. How do you feel active gaming activities can impact your students?

9. At this point, how you feel about implementing active gaming as a part of your physical education curriculum?

10. Discuss students' behavior relative to active gaming in physical education.

11. Who do you feel might benefit from active gaming?

12. Now that the students have moved around the active gaming room in various ways, discuss if you believe particular rotations have an effect on their participation.

13. Is there anything else you would like to tell me about active gaming?

Appendix B.3: Physical Education Teacher's Interview Questions –3rd

1. Tell me how you feel about active gaming after the eight weeks of implementing it with your fifth grade class.

2. Discuss how you think your students have felt using active gaming in physical education.

3. What kind of experiences do you feel your students have received from participating in active gaming activities during physical education?

4. How do you perceive your girls are experiencing active gaming?

5. How do you perceive your boys are experiencing active gaming?

6. Discuss any thoughts or issues you foresee with using Active gaming in your classroom.

7. How do you feel about Active gaming being a compliment to tradition physical education activities?

8. Describe any benefits you believe active gaming may have on your students?

9. Discuss students' behavior relative to active gaming in physical education.

10. If another physical education teacher asked you about using active gaming in physical education, how would you respond?

11. What do you think the student's overall experience has been using active gaming in physical education?

12. Now that the students have moved around the active gaming room in various ways, discuss if you believe particular rotations have an effect on their participation.

13. Is there anything else you would like to tell me about active gaming?

Appendix C.1: Student Journal Guiding Questions – 1st Entry

1. What does exercise mean to you?
2. Discuss your feelings about your physical education class.
3. If you could plan the perfect physical education class, what would students be doing?

Appendix C.2: Student Journal Guiding Questions – 2nd Entry

1. Write how you feel about active gaming in your physical education class.
2. Out of the following list of activities, Circle your favorite activities and write why you like those activities the most.

DDR (Dance Dance Revolution)	Gamecycle (Arm Bike)
Cateye Gamebike	XrBoards (Snowboards)
Dogfighting Bikes	3 Kick
Nintendo Wii	Gamercize (Stepper)
Boxing	

3. Out of the following list of activities, circle your least favorite activities and write why you did not enjoy these activities.

DDR (Dance Dance Revolution)	Gamecycle (Arm Bike)
Cateye Gamebike	XrBoards (Snowboards)
Dogfighting Bikes	3 Kick (3 Tower punch and kick)
Nintendo Wii	Gamercize (Stepper)
Boxing	

Appendix C.3: Student Journal Guiding Questions – 3rd Entry

1. How you feel about active gaming in physical education class.
2. How do you feel about active gaming as a type of exercise?
3. How often would you participate in active gaming away from school?
4. Out of the following list of activities, circle your favorite and write why you like those activities the most.

DDR (Dance Dance Revolution)	Gamecycle (Arm Bike)
Cateye Gamebike	XrBoards (Snowboards)
Dogfighting Bikes	3 Kick
Nintendo Wii	Gamercize (Stepper)
Boxing	

5. Out of the following list of activities, circle your least favorite activities and write why you did not enjoy these activities.

DDR (Dance Dance Revolution)	Gamecycle (Arm Bike)
Cateye Gamebike	XrBoards (Snowboards)
Dogfighting Bikes	3 Kick (3 Tower punch and kick)
Nintendo Wii	Gamercize (Stepper)
Boxing	

Appendix C.4: Student Journal Guiding Questions – 4th Entry

1. Write about how you feel about your physical education class since you have been participating in active gaming.
2. What would you say if someone asked you, “What is active gaming”?
3. How have you changed since beginning active gaming in physical education?

Appendix C.5: Student Journal Guiding Questions – fifth Entry

1. Write about how you feel about participating in active gaming in physical education class the past 8 weeks.
2. If you could create the perfect physical education class, what would students be doing? What would you be doing?
3. If you could participate in active gaming anytime you wanted to, including at home or away from school, how often would choose to do so?
4. Out of the following list of activities, circle your top 3 favorite and write why you like those activities the most.

DDR (Dance Dance Revolution)	Gamecycle (Arm Bike)
Cateye Gamebike	XrBoards (Snowboards)
Dogfighting Bikes	3 Kick
Nintendo Wii	Gamercize (Stepper)
Boxing	

5. Out of the following list of activities, circle 3 of your least favorite activities and write why you did not enjoy these activities.

DDR (Dance Dance Revolution)	Gamecycle (Arm Bike)
Cateye Gamebike	XrBoards (Snowboards)
Dogfighting Bikes	3 Kick (3 Tower punch and kick)
Nintendo Wii	Gamercize (Stepper)
Boxing	

Appendix D: Physical Education Teacher's Journal Guiding Questions

1. Describe your students' experiences with active gaming in your physical education class today?
2. Discuss any positive or negative experiences with active gaming in class today.
3. How do you feel about active gaming as part of the curriculum?
4. How do you perceive girls are experiencing active gaming?
5. How do you perceive boys are experiencing active gaming?
6. Discuss if you feel the way the students rotate or move in the active gaming room effects their participation.
7. Discuss any behavior changes you may see with your class participating in active gaming.
8. Discuss active gaming in terms of any successes the students may have experienced.

Appendix E: Fieldnote Recording Form – Researcher

Date:	Session #:	Time Started:	Time Ended	Total Time:	
Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Participant 5**	**Participant 6**

Appendix F: Fieldnote Recording Form – Graduate Student

	Date:	Session #:	Time Started:	Time Ended	Total Time:	
Time	**Participant 1**	**Participant 2**	**Participant 3**	**Participant 4**	**Participant 5**	**Participant 6**
1.00						
2.00						
3.00						
4.00						

Appendix G: Active Gaming Fitness Unit Lesson Plans

Active Gaming 8 Week Fitness Unit – Lesson #1

Lesson – Understanding the muscles in the body while participating in active gaming (30min)

Grade: fifth

Objectives:

1. Students will explore the active gaming environment with a partner to gain a better understanding of the activities.
2. Students will understand which muscles they are using with 80% accuracy using a variety of muscle groups while playing the active games.
    a. PE.5.L.2.4: Explain how technology can assist in the pursuit of physical fitness.
    b. NASPE Standard 2**:** Demonstrates understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities.
3. Students will complete the muscle activity worksheet with 80% accuracy.
    a. PE.5.L.1.4: Use technology and/or information literacy to enhance regular participation in physical activities.
    b. NASPE Standard 2**:** Demonstrates understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities.
4. Students will be able to name other sports or activities that utilize the same muscles used during the active gaming activities.
    a. PE.5.C.1.8: Compare and contrast skills/sports that use similar patterns/concepts.
    b. Standard 2: Demonstrates understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities.
5. Students will work responsibly with their peers 100% of the time.
    a. PE.5.R.1.4: Recognize and appreciate similar and different activity choices of peers.
    b. NASPE Standard 5: Exhibits responsible personal and social behavior that respects self and others in physical activity settings.

Materials/Equipment: Active Gaming P.E. facility, worksheet and pencil (1 for every pair)

Cues: Where do you feel it? Find the muscle

Introduction:

The teacher will introduce the unit by briefly explaining the term fitness. The teacher should introduce words such as heart rates (beats) and the various muscle groups. The students will touch each of the larger muscles as the teacher discusses them (e.g. biceps, triceps, thighs, hamstrings, shoulders, abdominals, back, and chest muscles).

Description of Activity:

Students will work with a partner to complete the muscle activity worksheet as they participate in a variety of active gaming activities. The students will choose their active game and will play for 5 minutes. At the end of the 5 minutes the students will feel in the worksheet for that particular activity and then rotate to a new activity. As they are playing, the focus should be on having the children ask what muscles they feel working and what is that muscle called. This is a two day activity so activities played on Day 1 should not be repeated on Day 2.

*This should be semi-structured so the teacher should not decide where students rotate – they need to explore the environment and maintain responsibility when moving to a new activity.

Closure/Assessment:

Day 1: Review the concept of fitness and the muscles – check for understanding visually

Day 2: Review the Muscle Worksheet – ask students about their worksheet. Discuss next week's fitness focus being on the intensity levels of the active games and how it affects their bodies.

Names:_____

Where is that Muscle?

1. **Cateye GameBikes:** Where did you feel it?
   _____
2. **XrBoards:** Where did you feel it?
   _____
3. **Gamercize:** Where did you feel it?
   _____
4. **Nintendo Wii:** Where did you feel it?
   _____
5. **Xavix Boxing:** Where did you feel it?
   _____
6. **Gamecycle:** Where did you feel it?
   _____
7. **Dog Flight Simulators:** Where did you feel it?
   _____
8. **3 Kick:** Where did you feel it?
   _____
9. **Dance Dance Revolution:** Where did you feel it?_____

On the back, list a sport or activity for each of the muscles listed below

The Muscles:

Arm Muscles: Biceps (Front of Arm) and Triceps (Back of Arm)

Leg Muscles: Quadracepts (Front of Leg) and Hamstrings (Back of Leg) and

Calves (Bottom and Back of Leg)

Shoulder Muscles: Deltoid & Trapezius **Chest Muscles:** Pectorals

Back Muscles: Rhomboids & Lattisimus Dorsi

Active Gaming - 8 Week Fitness Unit – Lesson #2

Lesson – Understanding your heart beat during different active gaming activities (30min)

Grade: fifth

Objectives:

6. Students will explore the active gaming environment with a partner in order to categorize the activities as low intensity, moderate intensity, or high intensity.
7. Students will complete the Feel the Beat Worksheet 100% by putting various active games in low, moderate, and high intensity categories.
    a. PE.5.L.2.4: Explain how technology can assist in the pursuit of physical fitness.
    b. NASPE Standard 2**:** Demonstrates understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities.
8. Students will recognize their heart beating at various intensity levels with 80% accuracy while participating in the active games.
    a. PE.5.L.1.4: Use technology and/or information literacy to enhance regular participation in physical activities.
    b. NASPE Standard 2**:** Demonstrates understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities
9. Students will be able to name other sports or activities that make the heart beat at high, medium, and low intensity levels.
    a. PE.5.C.1.8: Compare and contrast skills/sports that use similar patterns/concepts.
    b. Standard 2: Demonstrates understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities.
10. Students will work responsibly with their peers and value their opinions 100% of the time.
    a. PE.5.R.1.4: Recognize and appreciate similar and different activity choices of peers.
    b. NASPE Standard 5: Exhibits responsible personal and social behavior that respects self and others in physical activity settings

Materials/Equipment: Active Gaming P.E. facility, worksheet and pencil (1 for every pair)

Cues: Feet the beat

Introduction:

The teacher will discuss the heart beat and the three levels of intensity (low, moderate, high). The teacher should give brief examples of an activity that may fit each intensity level. The teacher should have the students run in place for one full minute and then ask them to pay attention to their heart beat – they can actually tough their chest if preferred to give them an idea of how to be aware of how fast their heart is beating (without taking a pulse).

Description of Activity:

Students will work with a partner to complete the Feel the Beat worksheet as they participate in a variety of active gaming activities. The students will choose their active game and will play for 10 minutes. At the end of the 10 minutes the students will feel in the worksheet for that particular activity and then rotate to a new activity. As they are playing, the focus should be on having the children pay attention to how hard their heart is beating at various activities. This is a four day activity and activities should not be repeated. Students will not get to all stations but will have the opportunity to choose the 8 stations out of 9 available.

*This should be semi-structured so the teacher should not decide where students rotate – they need to explore the environment and maintain responsibility when moving to a new activity.

Closure/Assessment:

Day 1: Review the concept of the heart beating at various intensity levels

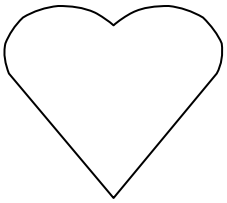
Day 2: Review the Feel the Beat Worksheet – ask students about their worksheet. Discuss why some students may have different answers. Discuss next week's focus being on the determining heart rates while participating in active gaming.

Day 3: Review the worksheet again – focus on not going to activities they have already been to before.

Day 4: Closure to activity – review other sports with varying intensity levels as mentioned on the worksheet

Names:_____

Feel the Beat!!!



***Circle the intensity level you feel best fits each activity.

Activity	Intensity Level		
10. **Cateye GameBikes:**	Low	Moderate	High
11. **XrBoards:**	Low	Moderate	High
12. **Gamercize:**	Low	Moderate	High
13. **Nintendo Wii:**	Low	Moderate	High
14. **Xavix Boxing:**	Low	Moderate	High
15. **Gamecycle:**	Low	Moderate	High
16. **Dog Flight Simulators:**	Low	Moderate	High
17. **3 Kick:**	Low	Moderate	High
18. **Dance Dance Revolution:**	Low	Moderate	High

*** Name one sport or activity that makes the heart beat at a…

High Intensity Level_____

Medium Intensity Level_____

Low Intensity Level_____

Active Gaming 8 Week Fitness Unit – Lesson #3

Lesson – Understanding the difference between muscular strength and muscular endurance

Grade: fifth

Objectives:

1. Students will actively participate in active gaming the full time in each station rotation.
2. Students will understand how physical activity affects the rate at which their hearts beat
3. Students will complete the Heart Rate worksheet with 80% accuracy.
4. Students will respect their peers and work cooperatively 100% of the time.

NASPE Standards: This lesson addresses NASPE Standards 1, 2, 4, and 6

Sunshine State Standards: This lesson addresses the Sunshine State Standards: PE5.C.1.3, PE5.L.2.1, PE5.L.2.4, PE5.R.1.4

Materials/Equipment: Active Gaming P.E. facility

Cues: Be active, strength or endurance

Description of Activity:

The teacher will introduce the lesson by briefly explaining the difference between muscular strength and endurance. The teacher should tell them at the end of the class she will be asking the students the games they played and whether they felt the activity focused on muscular strength or endurance. Students will then have the choice of the activities they will play and with whom they want to play them. The main objective is for the students to remain active. Discuss waiting for DDR – only 2 at a time can wait and should practice behind the pads. Only 1 person can wait for an activity (if someone is playing a Wii game, only one student can be waiting for that activity.

Closure/Assessment:

Review the concept of muscular strength and endurance- or ask students to discuss these concepts. Ask the students what they played and whether it focused on strength endurance.

Active Gaming 8 Week Fitness Unit – Week 4

Lesson – Understanding heart rates and how to calculate average and maximum Heart Rates

Grade: fifth

Objectives:

11. Students will actively participate in active gaming the full time in each station rotation.
12. Students will understand how physical activity affects the rate at which their hearts beat
13. Students will complete the Heart Rate worksheet with 80% accuracy.
14. Students will work responsibly with their peers 100% of the time.

NASPE Standards: This lesson addresses NASPE Standards 1, 2, 4, and 6

Sunshine State Standards: This lesson addresses the Sunshine State Standards: PE5.L.1.4, PE5.L.2.4, PE5.R.1.3

Materials/Equipment: Active Gaming P.E. facility, worksheet and pencils (1 each students), MIO Heart Rate Monitor

Cues: Feel the Beat

Introduction:

The teacher will introduce the unit by briefly explaining the idea of heart heats and heart rates – how the intensity of an activity affects the heart beat. The teacher should then discuss that she will use her MIO heart rate monitor to help them find their heart rates to record on their worksheet so they can later determine their average and maximum heart rates.

Description of Activity:

Students will choose their groups of 3 for this four day lesson. They will rotate in a structured station set up – 9 total stations. They will spend approximately 8-10 minutes at each station. Before the students begin, they will find their resting heart rate. This heart rate can be used for each of the sessions for this activity. During the station the teacher will walk around to the students 3-4 times during the station to let students find their heart rates. The students will record each heart rate on the worksheet. While waiting to participate on one of games, students should begin to calculate their average and max heart rate for the activity. Each session the students will complete the worksheet.

Closure/Assessment: Review the concept of heart rates- check for understanding visually. Ask some students to talk about how they got their max heart rate and average heart rate. Why is it important to them?

NAME:_____ Date:_____

Active Gaming Heart Rate Worksheet

Activity #1_____Activity #2_____

1. Record your resting Heart Rate_____

2. Find the highest number listed. This is your maximum heart rate for today's lesson_____

3. Record your average heart rate by adding all heart rates recorded in the chart and divide them by your total number of readings
   a. Sum of all heart rates_____
   b. Sum of heart rates divided by # of readings_____

4. What would make your heart beat faster on these activities?_____
   _____
   _____

5. Give at least two examples of activities that you think would make your heart beat over 130 beats per minute.
   _____
   _____

Reading #	Heart Rate
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total:	

Active Gaming 8 Week Fitness Unit – Lesson #5

Lesson – Understanding the importance of obtaining moderate to vigorous physical activity 60 minutes a day on most days of the week – Obtaining as many minutes of moderate to vigorous physical activity during physical education class. (30min)

Grade: fifth

Objectives:

1. Students will understand the importance of obtaining 60 minutes of moderate to vigorous physical activity on most days of the week.
2. Students will obtain a minimum of 15 minutes of moderate to vigorous physical activity during each class.
3. Students will complete the scavenger hunt worksheet with 80% accuracy.
4. Students will work responsibly with their peers 100% of the time.

NASPE Standards: This lesson addresses NASPE Standards 1, 3, 4, 5 and 7

Sunshine State Standards: This lesson addresses the Sunshine State Standards: PE.5.C.1.3, PE.5.L.11, PE.5.L.1.4, PE.5.L.2.4: PE.5.R.1.3

Materials/Equipment: Active Gaming P.E. facility, worksheet and pencil for each student

Cues: Pump it up

Introduction:

The teacher will introduce the unit by briefly explaining the goal and importance of obtaining 60 min of physical activity a day. She will then explain that the goal with the scavenger hunt is to obtain as many of these minutes in class the next two days.

Description of Activity:

Students will work independently or with a partner in order to complete as many activities on the worksheet – Scavenger Hunt. Students should not repeat an activity once completed.

.Closure/Assessment:

After each class let students discuss how many activities they were able to complete. Review the 60/day goal. Possibly let them suggest how they can get more physical activity at home.

Name:_____

Video Game Scavenger Hunt

#1 Game: **Xavix Boxing**

Cues: **Quick Punches** **Count your knockdowns!!!**

1. (Mode) Training: Complete 2 sections in Exercise session One: 1_____ 2_____

2. (Mode) Training: Complete 2 sections in Exercise session Two: 1_____ 2_____

3. (Mode) Training: Complete 2 sections in Exercise session Three: 1_____ 2_____

Comments:

#2 Game: **GameBikes**

Cues: **Control**

1. (Mode)Freestyle High Score Challenge Score:_____

2. (Mode)Race_____ Time:_____

Comments:

#3 Game: **Gamercize**

Cues: **Steady stepping**

1. One 8 minute session _____

Comments:

 # 4 Game: **Dance Dance Revolution**

Cues: **Feel the rhythm**

1. Song #1 Mode: Beginner Light Standard Heavy Letter Score_____
2. Song #2 Mode: Beginner Light Standard Heavy Letter Score_____

Comments

 # 5 Game: **3 Kick**

Cues: **"Listen" Quick Feet**

1. Round 1: 1 minute _____ Score _____
2. Round 2: 1 minute _____ Score _____
3. Round 3: 1.30 minutes_____ Score_____
4. Round 4: 1.30 minutes_____ Score_____

Comments:

 # 6 Game: **Nintendo Wii**

Tennis Cues: **Firm wrist Weight on front foot**

1. Tennis: Complete all 3 training modes _____
2. Bowling or Golf (your choice):Complete all 3 training sessions_____

Comments:

About the Author

Lisa Witherspoon Hansen is Co-Director of the USF XRKade Active Gaming research laboratories in Tampa, FL. Lisa has taught elementary and middle school health and physical education for four years and is currently an instructor in the department of physical education and exercise science at the University of South Florida. In the past three years Lisa has given over 15 presentations ranging from local to International conferences and events, and (co) authored seven print publications and five video publications. Lisa has been actively involved in Active Gaming since 2005, ranging from the development of the first Active Gaming facility for children to serving as a consultant and International presenter on the topic of Active Gaming. Lisa currently serves on two NASPE Technology Committees with a focus on developing effective teaching practices implementing technology in the physical education classroom. This dissertation has been written as part of the requirements for the Ph.D. degree in Early Childhood Education at the University of South Florida.