ONLINE AND OFFLINE GAMING SOCIAL PREFERENCES OF STUDENTS

by

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George Mason University
Fairfax, VA

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By

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Dedication

To my son, Corwyn Shaffer: your intense desire to explore and discover will continue to inspire me.

Acknowledgements

I share this accomplishment with the people who made this journey possible for me.

I wish to thank my committee members who were generous with their expertise and precious time. A special thanks to Dr. Priscilla Norton, my committee chair for meeting me on the weekends; her countless hours of reflecting, reading, encouraging; and most of all for not giving up on me. Thank you Dr. Joe Maxwell for agreeing to serve on my committee and providing me the support and encouragement when I needed it the most. Thank you Dr. Kevin Clark for your guidance and agreeing to serve on my committee.

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A special gratitude to my loving parents, for instilling in me the desire to continue my education and be a lifelong learner.

Finally, for my supportive husband, Herb, who made sacrifices without choice and will probably never read this dissertation.

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Abstract

ONLINE AND OFFLINE GAMING SOCIAL PREFERENCES OF STUDENTS

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George Mason University, 2012

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The objective of this study was to examine the relationship between the self-reported demographic characteristics of high school students that play games online and their social preferences when playing offline and online. Adolescents are using

communication tools while playing games to meet new people, learn new strategies, and maintain friendships. Online gaming is partially fulfilling the adolescent's social and learning needs. This study found the average participant played video games less than one hour a day, identifying them as casual gamers. Participants preferred to play online games and to play collaboratively with other people rather than playing alone or against the computer. This study was designed to be a starting point for understanding how students interact when playing games and how this type of engagement can be transferred to learning situations and inform the design of educational games.

Introduction

"Focusing on the ways that entertainment technology engages us can result in methods that we can transfer to any learning situation" (Smith-Robbins, 2011, pp. 58-59). Online gaming is one of those engaging entertainment technologies that continue to absorb teenagers and people of all ages.

Online gaming has seen a significant increase in subscribers over the last few years. The 2007 Parents and Teen Survey reported that 49% of teen Internet users play

computer or console games online (Lenhart, Madden, Smith, & Macgill, 2007), while

Pew's Internet & American Life Project 2011 Teens and Digital Citizenship Survey

reported that 85% of online teens (12-17 years of age) play video games. In addition, Pew

reported 50% of teens play games on social networking sites (Lenhart, et al., 2011). This

increase is likely due to the release of next generation game consoles, mobile devices,

and the increasingly engaging content of games. Game consoles and online gaming have

become so robust that people of all ages are connecting and joining the online gaming

world.

It has not been clear who comprises the online gaming world because statistics

vary among research reports. The 2007 Pew study stated that male teens are more likely

to play games online than female teens and that the majority of those males are younger

teens (Lenhart, et al., 2007). Entertainment Software Association's report, *Essential*

Facts About the Computer and Video Game Industry, reported that 51% of gamers play

online with 53% of players being male and 47% female (2007). Another study, Nielsen's

Benchmarking the Active Gamer (2005), reported a similar scenario concerning the

gender of gamers. Nielsen found that in casual online gaming the gender split was 49%

women and 51% men. However, one finding remained consistent among reports and that

was that males outnumber females in the online gaming world but not by much. In the

last few years, females have infiltrated the gaming world, causing game designers to

recognize a new market of gamers.

Further identification of online gamers from the Pew study reported the mean

income of families with online teen gamers to be less than $30,000 a year (Lenhart, et al.,

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2007). In addition, the Nielsen study revealed a new emerging audience of Hispanic gamers (2005).

Online gaming has made an economic impact with more than 4.4 million console households in America subscribing to an online game service in quarter four of 2006 (Herrmann, 2007). Entertainment Software Association (2010) also reported computer and video game sales (including hardware and software) in the US for 2010 reached $25 billion. The growth of the gaming world in America has caught the attention of many markets.

Due to the interest in gaming and online gaming, educators are beginning to realize the learning potential behind many video games. Galarneau and Zibit (2007) believed students playing online games were developing 21st century skills and becoming better knowledge workers developing skills such as critical thinking, collaboration, and information literacy. Gee (2007b) stated that video games were valuable learning tools because gamers are able to be active participants, solve complex problems, customize their own learning, and provide information "Just in Time" (data or skills are applicable immediately). In addition, other research has shown surgeons with video game experience performed better in simulated surgeries than those surgeons with no video game experience (JAMA & Archives Journal, 2007), and the military has been using gaming simulations as a source of training for combat, teaching strategies, and teamwork (Prensky, 2001). Sergeant Brian Martin at an Arizona Army base made this statement about their drone pilot training program, "We like to use the younger generation because

they've been playing the video games, so they kind of have that mental capacity and their brain is already setup to think that way" (Smith, 2010, para. 2).

The growing world of gaming may have much to offer education as games have become more complex and engaging. Yet, recent educational games and classroom instruction fail to be as engaging and do not meet the needs of students. Therefore, the gaming world may be able to inform the design of educational games if researchers look at ways in which games are exciting, adaptable to different skill levels, collaborative, and informative (Federation of American Scientists, 2006a).

Background

Recent literature has suggested multiple learning outcomes associated with the gaming world even though some consider video games a waste of time. In addition, research has reported a negative or damaging effect on students as teachers rated students that played violent games as more hostile than other students (American Psychological Association, 2005). However, as the gaming world has grown and developed, many educators and researchers have begun to realize the learning potential and opportunities in gaming experiences. Gee (2005), for instance, stated that "good commercial games are based on good theories of learning" partially because the video games have been so successful at attracting and engaging players in time-consuming and complex games. Becker (2007) agreed,

> With a bit of effort, it is possible to find examples of computer and video games
> that embody every single worthwhile learning theory in existence. Whether the
> "instructional design" was intentional or not, game designers have had to figure

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out how to keep their audiences interested while they learn the games—and

judging by the number of people who willingly pay money for the experience,

they appear to have been far more successful than formal education has. (p. 3)

Gee recognized the deep learning that occurred when a person was immersed in

the virtual world of a game. Several of Gee's 36 learning principles (i.e., Active and

Critical Learning, Probing, Situated Meaning, Discovery) that occur during game play

revolve around active learning (Gee, 2003). Video games have been associated with

active learning because the player is exploring, experimenting, thinking, strategizing, and

reflecting in context. Gamers become immersed as they explore the game environment,

experiment with character roles, and manipulate objects. Often games are long and

involved enough that a player is able to apply concepts in different contexts, gaining a

deeper understanding of how and why something works or does not work. "Games

encourage exploration, personalized meaning-making and playful experimentation with

social boundaries . . ." (Shaffer, Squire, Halverson, & Gee, 2004, p. 16). In addition,

games provide a rich environment where gamers are able to assume different personas to

explore their identity.

Games and the online gaming world produce environments that are conducive to

developing social and team-building skills. Many parents and educators think playing

games is an isolated activity where players rarely interact with others. However, this

belief has been changing as parents and educators become more aware of the social

aspects of games. Since Massively Multiplayer Online (MMO) games originated, players

have had the opportunity to interact with international players. MMOs and other

multiplayer games present scenarios where players must play collaboratively to accomplish a task or mission. This creates situations where gamers assume a team role and communicate throughout game play. Gamers learn to communicate with other gamers who may or may not speak a common language. Gamers support one another during game play in an online virtual environment as they try to find ways to improve their game play (Gee, 2007a).

The online environment and other virtual environments related to games were described by Gee (2007a) as "affinity spaces." These spaces are different from online communities (i.e., Facebook, Twitter) because participants' first "bond" was their common interest and their second bond may or may not have been with another participant (Gee, 2007a). Sharing an affinity space exposes a gamer to many potential learning situations because newcomers and masters of the game share the space; the space encourages intensive and extensive knowledge; interactions of participants transforms content of the game; the space encourages individuals to share their knowledge and take on leadership roles; and games assume different levels of experience and knowledge (Gee, 2007a). These are traits many educators wish they could provoke in the classroom environment.

Although there has been evidence that valuable learning occurs through playing video games, K-12 education has been slow to adopt video games (console or online formats) as a supplement to or replacement for classroom instruction (Federation of American Scientists, 2006a). One reason is that many educators are not video gamers themselves so they do not realize the learning potential of the commercial games. In fact,

"…most of today's teachers know little if anything about the digital world of their students…" (Prensky, 2006a, p. 10). As a result, educators are not likely to understand effective ways to implement video games for learning and instead use games as a reward for completing an assignment or other good behavior (Schrader, Zheng, & Young, 2008). Another reason for slow implementation of educational video games is that many early game developer companies developed educational games for learning that do not fully immerse students. Most often, the games do not progress beyond a point-and-click interaction between the student and game. However, this drawback is not always the fault of the company or game designers. Prensky (2006a) reported a conversation with a designer who stated, "As soon as you add an instructional designer to a [game design] team, the first thing they do is suck the fun out" (p. 183). This reaction may have been due in part to the inexperience of the instructional designer as a gamer and concern that curricular needs be covered according to standards. (Most states in the United States set forth laws determining the curriculum taught by educators (Prensky, 2006).)

To encourage the progression of educational gaming, the Federation of American Scientists (2006b) with support from the Entertainment Software Association and the National Science Foundation has called for research. Research priorities were drawn from those recognized in the 2003 Learning Science and Technology Research and Design Roadmap produced by the Federation of American Scientists' Learning Federation Project. "The LS&T Roadmap describes a vision for next-generation learning systems and outlines a national research plan to radically improve approaches to teaching

and learning through information technology" (Federation of American Scientists, 2006b, p. 1).

Statement of the Problem

As the gaming world has grown and games have become more complex, many educators and researchers have begun to realize the learning potential of gaming experiences. Although there has been evidence that valuable learning occurs when playing video games, K-12 education has been slow to adopt video games (console or online formats) as a supplement to or replacement for traditional classroom instruction. To encourage the progress, development, and implementation of educational games in the classroom, the Federation of American Scientists with support from the Entertainment Software Association and the National Science Foundation announced a call for research

> to explore ways that the features of games could be applied to address the increasing demand for high quality education and training, and ways to address barriers to private sector investment in learning games-related research, product development, and new product and service introduction. (Federation of American Scientists, 2006b, p. 1)

Game features vary greatly among game genres: these features have not yet been explored in depth based on student demographics and gaming characteristics. Student demographics and gaming characteristics are important because students play games based on personal characteristics, preferences, and influences of others within their offline and online gaming contexts. Assumptions about the average gamer and preferences of gamers may be inaccurate for adolescent gamers. Adolescent gamers and

their social preferences have not been studied in depth to inform the design of educational games.

This research suggests there is much to consider when designing games for educational purposes. There are many factors and contexts influencing the selection of games and how a gamer experiences the game. In addition, students' choice for a game is dynamic and constantly changing based on their wider socio-cultural context, previous game experience, and immediate personal and social context of game play.

Therefore, the problem of the study is to examine the relationship between the self-reported demographic characteristics of high school students that play games online and their social preferences when playing offline and online. This study is designed to be a starting point for understanding how students interact when playing games and how this type of engagement can be transferred to learning situations and inform the design of educational games.

Research Questions

1. What are the demographics of high school students playing online games?

2. What are the social preferences of high school students playing online games?

    2.1. What are the social preferences (mode, friends, relationships, type of interaction) of high school students that play online games when playing offline?

    2.2. What are the social preferences (mode, friends, relationships, type of interaction) of high school students that play online games when playing online?

    2.3. Is there a difference between social preferences of high school students that play online games when playing offline versus online?

3. Is there a relationship between demographics and social preferences when gaming?

    3.1. Is there a relationship between demographics and social preferences when gaming offline?

    3.2. Is there a relationship between demographics and social preferences when gaming online?

4. What do students like about playing games?

    4.1. What do students like about playing games offline?

    4.2. What do students like about playing games online?

    4.3. Is there a difference in high school students' likes and dislikes about playing offline versus online?

Conceptual Framework Description

Addressed by Kozulin this conceptual framework uses Vygotsky's *perezhivanie* theory as a base, which is defined as,

> . . . a unity where, on the one hand, in an indivisible state, the environment is represented, i.e., that which is being experienced…and on the other hand, what is represented is how I, myself, am experiencing this, i.e., all the personal characteristics and all the environmental characteristics are represented . . . (Vygotsky, as cited in Kozulin, Gindis, Ageyev, & Miller, 2003, p. 130)

In other words students' environments are represented in everything they do, not often visible or obvious to others, and students experience a situation based on their personal

characteristics and what they have experienced in previous environments. Thus, when

students play a game, they bring previous knowledge and experience to the game and, as

a result, experience the game in their own unique way. In addition,

> Social behavior never develops in a vacuum and most of our behavior is
>
> influenced by the social context in which we have grown up. What students do
>
> and what they think is the result of the interaction with their surroundings, their
>
> outside world. (Veen and Vrakking, 2006, p. 28)

Students all experience life differently. Where students live, their social interactions, and

their life experiences all contribute to how they think and act. Students' gaming

experiences are not exempt from wider socio-cultural and immediate social contexts.

More research is needed about the socio-cultural context in which students play games

(Mäyrä, 2006).

Studies from the British Broadcasting Corporation (2005) and the Entertainment

Software Association (2007) have reported who was purchasing or playing games, but

there has been no in-depth information concerning how demographics, gamer

characteristics, and social preferences were affecting selection of game experiences.

Carr's (2005) research painted a more in-depth picture about gender and preferences by

reporting that female students did not necessarily prefer one genre to another. Instead,

their selection of games was contextual and influenced by many factors that are not

reported in the current research. Carr found in her study that female students would at

times select games based on the game's rules and structures, but other times choices

would be based on the immediate social context of play and the influence of wider socio-cultural contexts.

This indicates that forms of competency underlie and inform our gaming preferences—whatever our gender. In short, preferences are not static: our choices depend on where we are and to what games we have had previous access. Our preferences reflect what we know, who we know, what we have tried, or tired of, and what we will admit to.

Distinctions in taste between male and female players mirror patterns in games access and consumption that spring from (very) gendered cultural and social practices. (Carr, 2005, pp. 477-478)
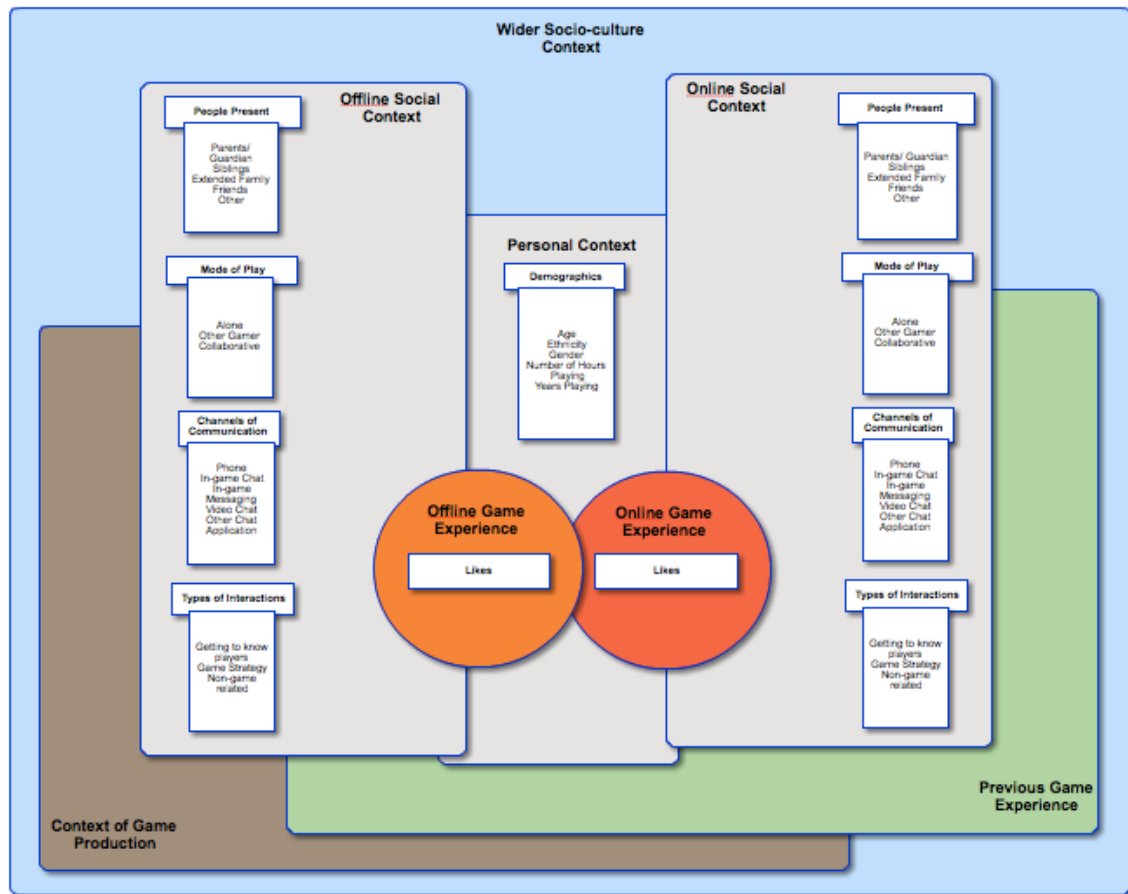
Figure 1. Conceptual framework graph of socio-culture contexts.

Students' choice of what game they play is not determined by a single factor. Mäyrä realizes that preferences of game play are informed by non-play experiences and contexts (2007). A combination of contexts within a wider socio-cultural context (Mäyrä, 2007) and changing gamer characteristics determine students' choice of what game to play and the type of game experiences they choose. Mäyrä's model is a step toward understanding a player's game experience by looking at layers of contexts and was

developed when Ermi and Mäyrä's Sensory, Challenge-based and Imaginative Immersion

(SCI) model (2005) did not adequately include the wide range of game experiences. After

additional research of Richard Johnson's "Circuits of Culture" (1986, p. 46), Mäyrä

created the Contextual Game Experience Model to illustrate a student's wider socio-

cultural contexts including personal and historical contexts. There are many out-of-game

contexts influencing students' gaming choices and experiences beginning with their

wider socio-cultural context, including such factors as the region where they live,

religious beliefs, culture, and political views. This layer is the wider context of social

norms, ways of thinking, and values in a society that affects the player and game world.

The next layer of contexts includes that of digital game production, which is determined

by game companies and students' previous game experience. Immediate social and

personal contexts are the context layers closest to students' game experience. "Closely

interlaced with the immediate personal contexts are the immediate social contexts of

play: how the closest people regard game playing, the immediate historical and

situational reasons they provide for digital play to take this form within this particular

context (Mäyrä, 2007, p. 813)." This conceptual framework focuses and builds upon

these two contextual layers. Building upon the model, an additional immediate social

context for online has been added to Mäyrä's model because students are immersing

themselves in the online context when playing games online. Therefore, online game play

is adding another immediate social context not previously included in the Contextual

Game Experience Model (see Figure 1).

The multiple contexts influencing students' online gaming experiences include students' wider socio-cultural context, immediate personal and social contexts (Mäyrä, 2007), and the online social context as shown in Figure 1. This separate online context involves other influences students would not otherwise experience in their immediate context, because the student is engaged in game play with students playing from different contexts. These influences then impact the social preferences and game experiences of students.

Students' online gaming social preferences are influenced by the diverse social contexts of other gamers because they establish relationships with the gamers they are playing with or against online. Afterwards students may befriend one another and become members of one another's online gaming environments. The online gaming environment is then developed and changes based on students' participation and friends affecting social preferences for game play. Social preferences affected include the mode of play and types of interactions. Students' choice of mode when playing offline may be to play against the computer but when playing online to play as part of a team. However, the reverse may be true for students that have family members or friends available in their immediate context for collaborative play offline. Types of interactions are likely to differ between students' immediate social and online social context of play. Online games often provide a set of communication tools that may not otherwise be available when playing offline, affecting students' choices for interaction and game experience. In addition, "interaction is always evolving because game play and experiences are never

the same because of online gamers (they are not the computer)" (T. Bailey, personal communication, May 24, 2011).

Is there a relationship between the immediate personal and social contexts of students and their social preferences when playing offline? When playing online? Is there a difference in what students like about games and in-game experiences when playing games offline versus online? With the increase of online game play and technology becoming more accessible to students, there is likely to be some impact on social preferences when students play a game offline versus online. In addition the likes, challenges, and experiences of playing offline versus online will differ because of these social preferences and social contexts.

Scope of the Study

This study examined high school students between the ages of thirteen and eighteen who play online games. Gaming communities exist for the Playstation, Wii, and Xbox consoles, with the Xbox Live community being the most established and evolved online gaming community.

An online survey was used to collect self-reported data from high school students. This method of data collection was susceptible to the interpretation of questions by students and students' perception of themselves and their gaming habits. Calls for participation were posted in online gaming communities and forums for adults and students and may not have reached all potential student gamer types.

The method of data collection may have also limited results by excluding students that may have temporarily not been an active member of an online game community.

Definition of Terms

Rapid growth in the gaming world has created much more diversified gamers with gamers immersing themselves in games for many different reasons. In an attempt to understand the participants as gamers, the following gamer characteristics have been identified in this study:

- The demographic characteristics used to describe participants in this study include age, race (African American, Asian, Hispanic, Native American, White, More Than One Race, and Other), gender, years of playing video games, and hours of playing video games.

- Game play may differ among students based on their years of experience. Therefore, a student's *gamer experience* was identified in years as reported by the participant.

- Most students knew other individuals who were also gamers. These *gamer relationships* may have influenced the gaming interest of the student; therefore, in this study these relationships are referred to as relationships students establish with people present in the same room or other online gamers.

- Time spent playing games attempted to identify the seriousness and dedication of a student to gaming and identified gaming habits and preferences. Therefore, the following time spent gaming was identified: (a) *Time spent playing* games was the actual time engaged with games; (b) *Time of day spent playing* was indicated

since some students were restricted to certain hours of a day for game play; and

(c) *Time spent playing online* games was indicated because not all students had

equal Internet access that permitted online gaming, which may have altered

gaming habits and preferences.

- A *console* was the device a student used to engage in game play. Consoles include

  PlayStation (PS) 1, PS2, PS3, Gameboy, iTV, mobile phone, X-Box, X-Box360,

  Nintendo GameCube, Wii, Sega Dreamcast, Sony PSP, and other similar devices.

Social gaming preferences were important when attempting to identify features of games

that may have been engaging and fun for students, which may be preferred when

designing educational games to be used in the classroom. It was important to identify

gaming preferences to determine what motivated or excited students to play games for

extended periods of time or until a mission was completed. This study attempted to

identify the following gaming preferences as reported by the participants:

- The *extent of social interaction* varied in games from no interaction to

  collaboration with other gamers in order to complete a mission. This gaming

  preference attempted to identify the importance of interaction to the students

  when gaming.

- *Types of interactions* were addressed in an attempt to identify whether student

  interactions focused on game or non-game related content.

Other definitions that were used in this study include:

- *Game* for the purpose of this study was defined as commercial video games that

  have been designed to be played on consoles (i.e., PS3, X-Box, Wii), mobile

handheld devices (i.e., cell phone, Sony's PSP), or computers and may have included an online component.

- *Online games* for the purpose of this study included commercial video games played over an Internet connection using a console or computer and permitted gamers to play against or collaboratively with other gamers.

Review of Literature

Overview

Video games have penetrated homes as a form of entertainment in today's culture. For example, "Americans now spend more money on video games each year than they do on going to the movies, and more time at home playing video games than watching rented videos" (Beck & Wade, 2006, p 3).

How did games become so immersed in today's culture? Games have been produced in different formats and played using many different devices—consoles, computers, and mobile handheld devices. Many single games existed in more than one format and often had an online component for playing. Games have been designed to infiltrate the home, be mobile, and connect gamers across networks. As a result, the game generation was born.

The gaming generation consisted of individuals who grew up immersed in digital technologies and the world of gaming. The average age of gamers in 2011 in the US was reported as 37 years of age with 42% female and 58% male. Gamers less than 18 years of age represented 18% of gamers (Entertainment Software Association, 2011). In contrast,

Pew's Teens, Kindness and Cruelty on Social Network Sites, reported 85% of teens (12-17) played video games (Lenhart, et al., 2011) implying more teens are gamers than the data the Entertainment Software Association reported.

Concerns Associated with Video Gaming

Even though games have become part of the popular culture and a wide range of people use games as their choice of entertainment, positive and negative beliefs remain about gaming. This section will explore several of those beliefs (digital divide, gender, violence, obesity, isolation, and time consumption) often addressed by educators and parents as areas of concern.

Digital Divide. Does the digital divide prevent some students from playing games or participating in online gaming? In previous years, there was believed to be a digital divide—

> a term coined in the 1990s to describe the perceived growing gap between those who have access to and the skills to use Information and Communication Technology (ICT) and those who, for socio-economic and/or geographical reasons, have limited or no access. (Digital Strategy, 2005, para. 9)

Recently, this digital divide has been explored in more depth, and there are contradictory results as to whether the gap is narrowing. Education World reported that the E-rate (a law that helps schools and libraries obtain access to state-of-the art services and technologies at discounted rates (Federal Communications Commission, 2004)) was on target, and impoverished school districts were receiving computers and Internet access

(Delisio, 2000). In 2011 The Pew Internet & American Life Project reported 95% of teens were Internet users (Lenhart, et al., 2011).

The Pew Internet & American Life Project also reported in 2009 that 22% of the people surveyed were not interested in getting online (a decrease from 33% in 2007) (Horrigan, 2009). However, these individuals were staying connected via TV, cable, or satellite instead of Web technologies. This led to another theory, "Is it the principle or the interest?" mentioned in another article by Education World (Steele-Carlin, 2000, para. 9). The article cited two individuals, Winters and Phinney (Steele-Carlin, 2000), that believed the digital divide had more to do with value. Meaning, do people see the value of a computer and Internet access in their life? Therefore, the question remained, "Is the digital divide by choice or because an individual does not have the means or skills to participate?" There was no current research identifying whether those who played games saw the value of Internet access and obtained it or whether those that choose not to have Internet access were not interested in gaming. However, a Pew researcher, Amanda Lenhart, did make this comment about teens and video games, "What's remarkable is the near universality of video game play among teens. These kids span economic and racial groups, location, family education" (Olsen, 2008, para. 7).

Gender. Like the ethnic backgrounds of gamers, the gender of gamers may have changed over recent years. Games have typically been created for males (Carr, 2005) with many of the genres on the market attracting more males than females. Shooting, fighting, and arcade games (Laurel, 1998) are genres that have been targeted toward males. Other game genres, even though they had the potential to attract females, typically

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contained male-oriented content (Laurel, 1998). However, some believed information about the gender of game players has changed significantly and that previous data about game player's gender was a misrepresentation (Bryce and Rutter, 2003). Recent research has reported there was a large female population of gamers (Entertainment Software Association, 2007; Pratchett, 2005) and their interests' spanned genres.

Violence. A meta-analysis of games and violence revealed a significant link between games and aggressive behavior, aggressive cognition, aggressive affect, and cardiovascular arousal, and decreases in helping behavior (Anderson, 2003). Gee (2007b) contradicted this meta-analysis by saying, "None of the current research even remotely suggests video games lead to real-life violence in any predictable way" (p. 11) and went as far as to say, "…some researchers have argued that video games have beneficial effects in regard to violence: for example, that teens use violent games as a way to manage feelings or anger or as an outlet for feelings of a lack of control" (p. 11). Beck and Wade (2006) reported criminal statistics that suggested the release of violent games into the homes of Americans actually did not increase juvenile crimes.

> Juvenile murder charges dropped by about two-thirds from 1993 to the end of the decade and show no signs of going back up. The rate of violence in school hasn't increased either-it just gets more media coverage. If video games are so deadly, why has their widespread use been followed by reductions in murder. (p. 54)

An ongoing debate continues over the possible link between violence and games, just as it does over a possible connection between violence and other media (TV and music).

Obesity. The linkage between games and obesity has been another debate, and research has been mixed on the significance between the relationship of the two. Results from a study by Vandewater, Shim, and Caplovitz (2004) suggested there was a curvilinear relationship between obesity and playing games for girls under the age of eight. Another study contradicted this research by stating, "Computer use, video games, and other sedentary behaviors were not significantly related to risk of overweight/obesity" (Burke, et al., 2006, p. 248). Research results continued to be contradicting with two additional studies that addressed games played on PS, PS2, X-Box, and Wii. A study at the Mayo Clinic (Lanningham-Foster, et al., 2006) found students burned more calories when playing Dance Dance Revolution than they did watching TV or playing sedentary games. The researchers from the study concluded, "activity-promoting video games have the potential to increase energy expenditure in children to a degree similar to that of traditional playtime" (Lanningham-Foster, et.al, 2006, p. 1835) but acknowledged the study group was small and warranted further studies (Sinclair, 2007). The second study by Graves, Stratton, Ridgers, & Cable (2007) found students burned more energy and calories when playing physically active games, but the intensity was not high enough to reach the recommended daily exercise for students. To date, it is unclear whether there is a link between obesity and gaming or not.

Isolation. Games were often believed to be an isolated activity because gamers were unaware of what was happening around them (Beck & Wade, 2006). Parents have worried their gamer children were not getting the social interaction they needed to function in society and school. However, Beck and Wade (2006) contradicted this belief.

Their survey found that gamers "seem to be slightly more people-oriented (or maybe people-stimulated) than those who didn't play games growing up" (p. 112). The design of games has changed to be more social in nature as gamers compete and collaborate with worldwide gamers when playing online. Even though young gamers appeared to be isolated, they were likely interacting with more people than their parents watching the evening news. "Bucking the stereotype that games aren't social, three-quarters of teens play games regularly with other people, either online or in person" (Olsen, 2008, para. 8).

Another perspective on the isolation of gaming came from a study by Wan and Chiou (2006). Their study looked at the motivations and psychological needs of adolescents to determine why Taiwanese adolescents were addicted to online games. Analysis of their results identified four categories for addictions to online games: entertainment and leisure, emotional coping, escaping from reality, and satisfying interpersonal and social needs. The emotional coping category included "diversions from loneliness, isolation, and boredom, releasing stress, relaxation, discharging anger and frustration" (Wan & Chiou, 2006, p. 763). With the latest generation of networked and social gaming, further research was recommended to continue the discourse of isolation, gaming, and teenagers.

Time Consuming. Parents have often considered games a waste of time or too time consuming but Beck and Wade (2006) disagreed. Beck and Wade (2006) surveyed 2500 U.S. businesses and found gaming skills built better business skills. Gamers were developing skills that would be useful to them in life and the workplace. A few highlights of the skills learned by gamers that apply to the work world included manipulating

electronic information, improved cognitive skills, improved visual memory, ability to develop team work ethics, and adding value to the work place (Beck & Wade, 2006). "Prof Wright said that the research shows that Counter-Strike is about much more than grim gunplay and racking up kills" (Ward, 2003, para. 9). Instead, the game was similar to chess, requiring gamers to consider strategies and tactics and rely "on trust and co-operation" (Ward, 2003, para. 18). Several other studies (Banerjee, (2008), Kawamoto, (2007) and Scanlon, (2007)) have reported that gamers build skills for the workplace.

Benefits of Video Games

      Learning Potential. The learning potential of the gaming world has not been fully charted, but there has been enough research and evidence to claim that learning occurs when a gamer plays games and gets involved in gaming communities. Many games required gamers to implement higher-order thinking skills while solving problems, making decisions, strategizing, and experiencing trial and error. Games have become more social as they have found an online presence where gamers have a space to compete and collaborate with one another. Learning occurred within a game's community online and through other portals (i.e., LAN parties, listserv, newsletters) as gamers shared knowledge about the game, created and dispersed strategy guides, mentored/advised one another, and contributed new content for the game. Galarneau and Zibit (2007) believed, "These online social environments can evolve into 'online learning communities' when they foster participants to actively engage in sharing ideas with others, furthering their own learning while at the same time advancing the collective knowledge of the group (Bielaczyc & Collins, 1999; Bruner, 1973; Cole, 1988; Lave, 1988; Mehan, 1983;

Norman, 1980; Riel & Polin, 2004; Rogoff, 1994; Scardamalia & Bereiter, 1994; Wertsch, 1997)" (p. 69).

Evidence of Learning Potential. Gee (2004, 2007b) and Prensky (2006a) both understood the complexity of recent games and realized the level of involvement needed for a person to successfully play and beat a game. They were able to see past the content of the game and evaluate the skills needed to play the game. Prensky has worked with teachers implementing video games into their curriculum and classroom to enhance learning. One teacher was Mark Greenberg who created games for his students when they were struggling with a concept in his middle school English class. Another teacher used Morrowind in her Language Arts class to teach characterization, cause and effect, and logical sequencing concepts. Finally, a teacher in England, Tim Rylands, received an award for his implementation of games in his primary school classes as he used games to improve verbal and writing skills and indirectly increased students' scores (Prensky, 2006).

Additional research displayed evidence of learning potential in games. Gamers who played first-person shooter games improved their visual attention skills because they were "30 percent to 50 percent better than non-players at taking in everything that happens around them" (Blakeslee, 2003, para. 2) and "They identify objects in their peripheral vision, perceiving numerous objects without having to count on them, switch attention rapidly and track many items at once" (Blakeslee, 2003, para. 2). Blakeslee continued to describe Dr. Daphne Bavelier's, an associate professor of cognitive neuroscience, emphasizes, "that the improved visual attention skills did not translate to

reading, writing and mathematics. Nor is it clear that they lead to higher I. Q. scores, although visual attention and reaction time are important components of many standardized tests" (Blakeslee, 2003, para. 6). Another study conducted by the UK, "concluded that simulation and adventure games—such as Sims City and RollerCoaster Tycoon, where players create societies or build theme parks, developed children's strategic thinking and planning skills" (British Broadcasting Corporation, 2002, para.1). Gentile's study (2007) found "Video game skill correlates with laparoscopic surgical skills." His data reported "Surgeons who had played video games in the past for more than 3 hours per week made 37% fewer errors, were 27% faster and scored 46% better overall than surgeons who never played video games. Current video game players made 32% fewer errors, were 24% faster and scored 26% better overall than their non-player colleagues" (Rosser, et al., 2004, para. 34). These are just a few examples of how games have been used for their learning potential.

Preparation for Careers

Military. The military has been using video games since 1970 to train soldiers with one of their early successes being *Microsoft's Flight Simulator* (Macedonia, 2002). Budget cuts in the military caused branches of the military to reduce the amount of time soldiers received combat training and hands-on piloting (i.e., flight, submarine, tank). As a result, the military turned to simulations (once created by the military but now created by commercial vendors for entertainment purposes). Commercial games such as *Doom* and *Falcon 4.0* have since been adapted to fit the needs of the military. Games like these met training needs including teaching strategy, teamwork, weapon training, anti-

terrorism, and other skills. Specific examples of how games have been used for military training follow.

- Rosemary Garris, of the Naval Air Warfare Training Systems Division, explained in Prensky's book, *Digital Game-Based Learning*, (2001, p. 10) that one of the goals behind implementing gaming for training purposes was to "motivate people to spend more time on training voluntarily."

- *Saving Sergeant Pabletti* was an interactive game used with soldiers in the Army after they completed basic training. This interactive game has been used with over 80,000 soldiers (up to 300 soldiers in one session) each year to teach "team skills from a values perspective" (Prensky, 2001, p. 7).

- *SubSkillsNet* was another interactive simulation used by the Navy on board submarines to simulate "surfaced bridge views, radar, sonar displays, fire control functions, and periscope" (Prensky, 2001, p. 9).

- *Falcon 4.0* has been implemented by the Air Force to train pilots because budget cuts have reduced pilots' in-flight training by 25% (Prensky, 2001).

- Finally, the National Guard used a game for constructive level (war-gaming) training where soldier's bullets were tracked so soldiers could replay actions and learn from them.

In recent years, the level of training for the military has advanced, demanding multifaceted gaming technology. Recent game technology implemented complex issues focusing on adaptive thinking and cultural awareness for Special Forces in addition to basic combat decisions. This Adaptive Thinking and Leadership simulation was the only

one of its kind that offered, "'highly interactive communications exercises in learning to respect and work with other cultures' says Raybourn" (Sandia National Laboratories, 2005, para. 4). The simulation placed trainees in an environment they would not otherwise be able to experience until a real situation occurred. Soldiers played on networked computers with up to 24 players, and instructors were able to modify the scenario and direction of the play as soldiers interacted with the simulation. Following completion of the simulation, instructors were able to conduct debriefing sessions for evaluation purposes (Sandia National Laboratories, 2005).

In summary, the military's implementation of video games for teaching and training purposes has proven the success of games as a training and educational tool. Games have been so successful the military continues to invest resources for future games. One such plan was the Navy's 10-year plan, which created a simulation, *Battle Stations 21* that put Navy recruits through a 12-hour mission where they "'man' a ship and draw on all they've learned to handle a 'very, very real and viceral [sic] environment'" (U.S. Department of Defense Game Developers' Community, 2005, para. 1).

Surgeons. Another field that has benefited from the experience of gamers was surgery. Research led by Dr. James Rosser found students that played more than three hours of games per week performed 42% better during laparoscopic surgery and made 37% fewer errors (Rosser, et al., 2007). According to Prensky, Dr. Rosser now has his surgeons warm-up with games before surgery because they resemble the actual surgery.

(Surgeons perform surgery via a computer monitor using controls similar to game controllers.) (Prensky, 2002).

Call for Research

A Summit on Educational Games led by the Federation of Scientists was held in 2006 to "…explore how the United States can harness the powerful features of digital games for learning…" (2006a, p. 3) as one way to prepare students with skills desired by today's United States employers. Participants of the summit came to a consensus that many features of digital games could meet high educational demands. The summit looked at the needs and key challenges and found:

- Many video games require players to master skills in demand by today's employers.

- There are several attributes of games that would be useful for application in learning.

- There are differences between games for education and games for entertainment.

- A robust program of research and experimentation is needed to enhance development of educational games by stimulating transfer of the art and technologies of video games to education and learning systems.

- High development costs in an uncertain market for educational innovations make developing complex high-production learning games too risky for video game and educational materials industries.

- Several barriers inhibit the markets for education games.

- Educational institutions need to transform organizational systems and instructional practices to take greater advantage of new technology, including educational games.

- Outcome data from large-scale evaluations of educational games are needed to demonstrate that these technologies are equal to or offer comparative advantage vs. conventional instruction methods (pp. 46-48).

The summit recommended further research be funded and conducted involving all "major stakeholders—government, researchers, industry, and education and training institutions" (p. 7a). By implementing educational games in education, students would learn to work with rapidly advancing technologies and be able to apply these skills in their careers to maintain America's leadership in technology.

Two areas of research that were recommended by the summit to define what we need to know about gaming for educational purposes included design of games for learning and adapting simulations to learning environments. Within the area, design of games for learning, the Summit recommended looking at "what features of games can be used to improve learning outcomes" (Federation of American Scientists, 2006b, p. 2). The R&D tasks included:

- Understanding the features of challenges that are crucial for motivation and learning;

- Understanding how stories/scenarios contribute to motivation and learning;

- Understanding the impact of immersion of engagement on learner motivation;

- Linking gaming features to goal orientation;

- Understanding the features of game playing that contribute to development of higher-level thinking skills; and

- Understanding how games can be integrated in classrooms and formal learning environments to support learning goals (Federation of American Scientists, 2006b, p. 2).

The second area of research focused "on the design of games and simulations so that they support learning and development of automated tools to streamline the development process and reduce development costs" (Federation of American Scientists, 2006b, p. 2). The R&D tasks included:

- Understanding the degree of authenticity/fidelity needed to support learning;

- Designing dynamically constructed narratives that permit the learner to make decisions that directly affect the direction and/or outcome of the story;

- Designing simulated actors with specific skills, knowledge, or personalities;

- Incorporating educational scaffolding; and

- Reporting and use of assessment and learner modeling data (Federation of American Scientists, 2006b, p. 2).

Educational Gaming

Research has shown positive results when games were implemented into classroom instruction. Gee considered games as a part of a new literacy (2007) and games may also integrate a way of knowing. "Games bring together ways of knowing, ways of doing, ways of being, and ways of caring: the situated understandings, effective social practices, powerful identities, and shared values that make someone an expert (Shaffer, Squire, Halverson, & Gee, 2004, p. 7)." Games have also been considered a tool to prepare for the future. The Federation of Scientists considered games as a way to prepare students with 21st century skills for the work place (2006a) because games have prepared gamers to communicate and interact in a high-tech global world. This section explores the positives and negatives of game play as an instructional tool in the classroom.

Active Learners. Games have been motivating to play because that has been the goal and focus of game designers, to keep players engaged so they will continuously return to the game (Prensky, 2006).

> How does Gameplay create motivation? By keeping the player engaged at every moment. It makes every second (or nanosecond in some cases) of the game a challenge—physically, intellectually, and/or emotionally. And it is this continuous challenge—at the precise context-and-user-appropriate level—that motivates. (Prensky, 2006a, p. 9)

Not only have games been motivating, but they have also engaged students as active learners instead of passive learners from the beginning to the end of the game.

21st Century Skills. Games have been important because gamers are developing 21st century business skills (Beck & Wade, 2006). Not every school has been successful preparing students for a career in the 21st century so games have served as a medium for exposing students to some of these skills. Many games have been designed to include an online component with a global audience so gamers interact with worldwide gamers by competing against them or joining forces in collaborative game play. Gamers have learned to communicate, interact, make decisions rapidly (based on information obtained), gain confidence, and work together in a high-tech global world.

Games reinforced skills valuable in the workplace. "Games are great practice for real life. Specifically, they're a pretty good training environment for real life in organizations in which collaborative problem solving is the order of the day" (Beck & Wade, 2006, p. 75). Along with collaborative problem solving, gamers have learned "how to manipulate electronic information" (Beck & Wade, 2006, p. 33), which has been a valuable 21st century skill. Corporations have also looked for employees that know how to work as a team and games have been a proven training ground for these types of skills. "…the game generation has highly developed teamwork skills and a strong desire to be a part of a team" (Beck & Wade, 2006, p. 82).

In addition, many games tracked a gamer's every move and best performances, which exposed students to another valuable 21st century skill. Gamers became immersed and were determined to beat their best scores or top scores of other gamers. "…they love the feeling of being immersed in data" (Beck & Wade, 2006, p. 92). The immersion of data sounded promising to corporations because "the demands of business require much

more complicated data analysis tools, and a workforce that can use them" (Beck & Wade, 2006, p. 89). Data was used as critical feedback and gamers interact and make decisions based on this feedback.

Gamers have amassed thousands of hours of rapidly analyzing new situations, interacting with characters they don't really know, and solving problems quickly and independently. Admittedly, they have gained that experience in a simplified world focused almost entirely on themselves, but that world has also emphasized tangible results and given them constant, critical feedback. (Beck & Wade, 2006, p. 80)

Educators recognized the 21st century skills students' were learning by playing video games and the value of that learning. Many educators wanted to implement the same type of learning into classroom instruction as was found in the Speak Up 2007 online survey. "Increasingly teachers are becoming interested in use of games to increase student engagement (65%), address different learning styles (65%), focus on student-centered learning (47%), and to develop problem solving and critical thinking skills (40%)" (Project Tomorrow, 2008, p. 4).

Obstacles Integrating Games. Games have tracked a large amount of data during game play such as a student's fastest time, average speed, total time of game play, accuracy percentage, top score, challenges accomplished, missions in progress, etc. This data would be valuable to an educator if the game had academic content. However, educators have not yet found games to be a worthwhile learning endeavor or a valid learning tool because obstacles have stood in the way of fully implementing games for

learning. This section introduces obstacles for educators that include content, complexity, time consumption, and violence.

Content. Another reason teachers have not implemented games into instruction is that games have not supported standards of learning.

> … curriculum that is available through the games is not necessarily the same curriculum our teachers have to teach according to the laws of their state (in the US, each state sets its own K-12 school curriculum). The same scenario applied to countries outside the US." (Prensky, 2006a, p. 185).

The requirements of the curriculum were also mentioned by teachers in the studies by Sanger (1997) and the F9 Group (2000). For this reason, it is important to design guides that can explain the merits of games to teaching staff and enable them to use them in a way that is oriented far more towards the acquisition of the knowledge required by the school curriculum. (Gros, 2003, para. 53)

Complexity and Time Consumption. Some games were too complex with a large learning curve so implementing games often required sacrificing instructional time and the trade-off was not worthwhile to educators (knowledge gained from author's experience).

> McFarlane et al. (2002) also assessed the knowledge acquired via the use of video games in primary and secondary teaching. The study was based on teachers' opinions on the limits and potential of video games. Their results reflected that most teachers had a very positive view of the adventure games and above all of the simulations. However, in spite of this very positive assessment, they stressed

the difficulty of using these simulation games in secondary teaching due to

pressure of time and the need to cover the educational program in its entirety.

(Gros, 2003, para. 52)

Violence. The news media and some researchers considered games violent and

inappropriate for classroom instruction so school administrators and parents' objected to

the use of games as an instructional tool. "Parents, and sometimes the rest of us, worry

that games are too violent, and that they desensitize young people to the real-world

consequences of lethal, often illegal acts, which are portrayed graphically and seemingly

without concern for morality" (Beck & Wade, 2006, p. 52). For example, a twenty-year

empirical review conducted by Nicoll and Kieffer reported that adolescents displayed

aggressive behavior after playing games (American Psychological Association, 2005).

One study showed participants who played a violent game for less than 10

minutes rate themselves with aggressive traits and aggressive actions shortly after

playing. In another study of over 600 8th and 9th graders, the children who spent

more time playing violent video games were rated by their teachers as more

hostile than other children in the study. The children who played more violent

video games had more arguments with authority figures and were more likely to

be involved in physical altercations with other students. They also performed

more poorly on academic tasks. (American Psychological Association, 2005,

para. 2)

What has been tried? Even though there have been many reasons for excluding

games from classroom instruction, there have been just as many reasons for making

games a part of the curriculum. Implementing games into classroom instruction has not been a common practice, however, so examples of implementations or reporting of these implementations is limited. However, a few scenarios will be described in this section.

Teachers have experienced what Kurt Squire experienced while conducting his dissertation research. Squire used the game *Civilization* in hopes of teaching history concepts to secondary students. He confronted many obstacles from hardware problems and student inattentiveness to game play being too complex. Several students never immersed themselves in the game because too much time was needed to understand the basics of game play. Students never gained the history concepts because of the game's complexity. However, those students that endured the complexities were able to understand basic history concepts. Squire concluded from his research that the *Civilization* game was effective for introducing students to geographical and history concepts but was not "as good at facilitating deep conceptual understandings of them" (Squire, 2004, p. 358).

Another implementation of the game *Civilization* in classroom instruction was mentioned in Teaching with Technology (Norton & Wiburg, 2003). An educator, Susan Rudolph, used *Civilization* as a supplement to teach the complex interactions of basic social structures to ninth grade students. She began the lesson introducing a social structure accompanied with a news clip to explain and open up discussion. After introducing all social structures, she introduced students to the game *Civilization* and how the game could be used to "manage a civilization's development" (Norton & Wiburg, 2003). Once students had a basic understanding of the game and civilizations (after

several weeks of instruction and additional resources), they divided into teams and played *Civilization*. Following the game experience students discussed and reflected on what they had learned from the game.

What is working? Tim Rylands located near Bristol, UK has been integrating video games in his classroom for eight years with primary students. One of his most successful integrated games has been the game, *Myst.* He explains how he integrated the game,

> I use the games in the *Myst* series as a stimulus for discussion; to develop speaking and listening skills; to inspire children's descriptive writing; and as a way of improving all round confidence in language work. We 'walk' through the environments, describing the sights and sounds around us. It is a shared and totally immersive experience. In addition to the language work, we also compose music to accompany our 'Walks' and artwork to record our travels. (Rylands, 2005)

Rylands used the game to motivate students, learn from the problem solving involved in the game, and develop literacy skills. Rylands believes the time spent implementing games with students has led to improvements in the students' academics. "He believes the quality of his pupils' listening and writing skills is vastly improved because of use of the game in lessons" (Clothier, 2005, para. 13).

Another successful integration of games was by Mark Helen, who used *Dance eJay*, *Sims Earth*, and *Microsoft Flight Simulator* with his primary students. In one scenario, Helen wanted his students to understand what it was like to live in a village so

he used *Microsoft Flight Simulator* with the add-on program, *VFR Photographic Scenery*.
Helen took his students on a simulated flight to explore villages.

> Mark had equipped the children with maps of the area and he could halt the
> program to look at features and get children to identify the names of villages en
> route. They eventually ended up at Cley next to the Sea near Blakeney Point and
> this was the cue to go into Google image search and find some pictures of the
> village, including its famous windmill. An ordinary Google search subsequently
> provided the children with some evidence of what goes on in Cley. (Rylands,
> 2006, para. 7)

This scenario was another example of instruction that seemed to work when integrating
games as a learning tool.

The following statement summed up what has currently worked with the
integration of games in instruction, "By combining teacher presentations, textbook
readings, small-group analysis, and the computer simulation, students were developing an
in-depth knowledge…" (Norton & Wiburg, 2003, p. 88). Success seemed to center
around the game being a supplemental resource instead of an independent learning tool.
The educator was also actively involved by using the game as an instructional tool to
introduce new content. In summary, games have been used to motivate, engage, build
skills, understand concepts, reflect, and guide class discussions.

Diversity of Gamers

The world is a very diverse place because the world has been flattened by
technology. (Friedman in 2005 referred to the "world is flat" because businesses had

turned to a global market.) Technology has made it easier for global markets to connect

and do business with diverse populations and for individuals to connect with other

cultures, bringing diversity to our front doors.

In education, K-12 classrooms started representing the population and became

more diverse. In the United States between 1995 and 2005, the elementary and secondary

enrollments changed to represent more diversity. The largest growth was seen with

Hispanic enrollment (63%) and the largest decrease in enrollment was Whites (-7.7%)

(National Center for Education Statistics, 2007). The diversity of enrollment in the
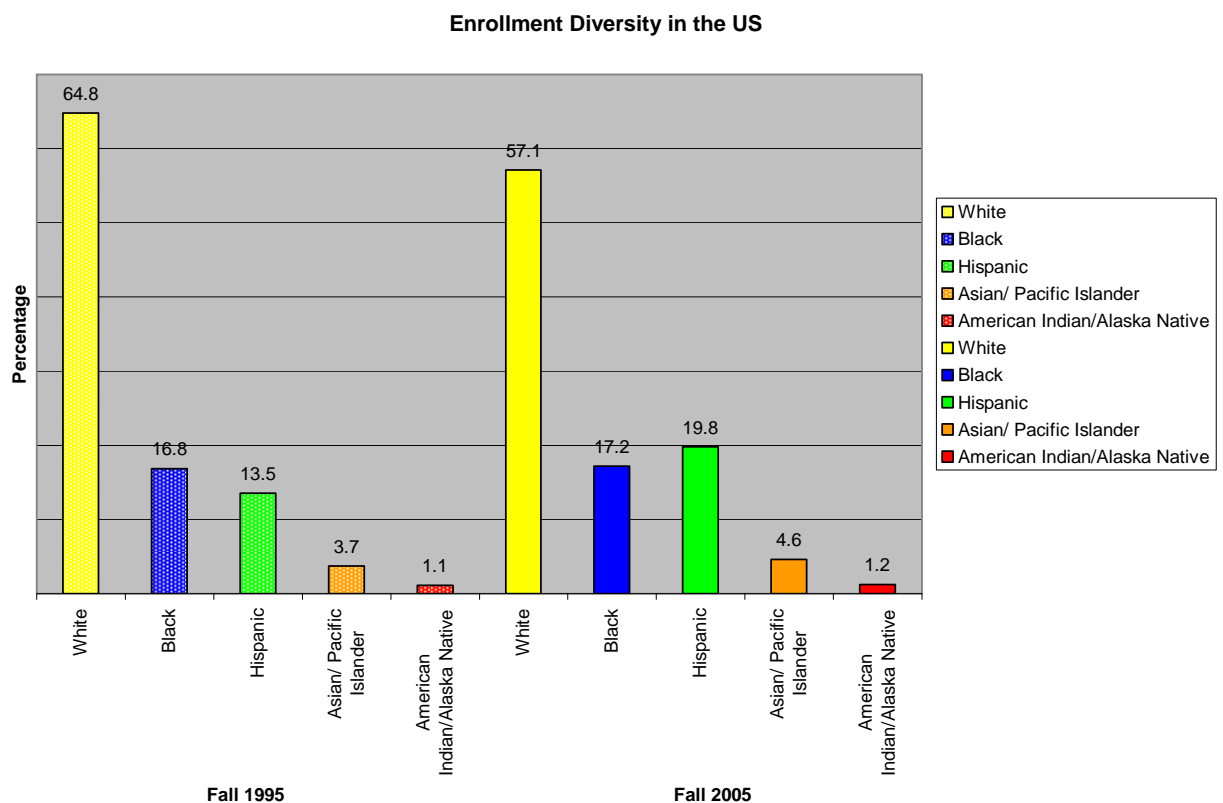
United States is displayed in Figure 2.

Enrollment Diversity in the US

Figure 2. Enrollment diversity in the United States 2005.

Japan, England, and the United States were the leading producers and players of games, but with advancing technology, access to technology, and online gaming, the gaming world has become more diverse. One example is Microsoft's Xbox gaming console and the online component, Xbox Live. Online subscribers for the Xbox Live service reached 35 million members in January of 2011 (Gilbert, 2011). Subscribers created a gamertag, which identified them as a user and enrolled them by country of residence. Looking at Microsoft's list of Xbox Live countries and regions indicates that Xbox Live subscribers represented 35 countries (Microsoft, 2010).

Since K-12 classrooms and gaming have become more diverse, there was a growing interest in the demographics of students and socio-cultural context in learning. This interest evolved from the socio-cultural theory based on Vygotsky's work, which states an individual can only be understood by studying the culture and social world in which that individual developed. Therefore, educators and researchers began to consider the importance of demographics and culture in instruction.

In research, games have been explored for socio-culture context within the game experience, but more research was needed on the socio-cultural context brought to the game in which it was played (Mäyrä, 2006, p. 3). As Mäyrä states there is, "…no reliable national or global surveys of basic demographic player data in the same manner that the reading of literature or watching of television are researched" (2006). The most comprehensive studies were by the BBC (Pratchett) in the UK during 2005 and Entertainment Software Association in the US during 2007. The studies reported who was purchasing or playing the games, but there was no in-depth information concerning

how socio-cultural contexts were effecting selection of games played. Mäyrä's paper called for a more in-depth international study that "…would address a wide range of game playing behaviors, from casual to very dedicated ones, while taking into account genre (and gender) difference, as well as micro- and macro level of games' socio-cultural significance." (2006, p. 4). Mäyrä encouraged researchers to look beyond the cultural context within the game to the cultural context in which it was played and the cultural context brought to the table. There was much more behind a gamer's decision to play a game. More research was needed to understand the attitudes about types of games selected by diverse gamers. This information could then inform the design of educational games to reach the diversity of students in education.

Socio-cultural Theory

> Social behavior never develops in a vacuum and most of our behavior is influenced by the social context in which we have grown up. What children do and what they think is the result of the interaction with their surroundings, their outside world. (Veen and Vrakking, 2006)

From the time people are born they experience life differently. Where they lived and whom they lived with begins shaping how they think and understand life. In addition, religion, politics, media, and economic class contributed to what they know and how they know it. When students came to school to learn they brought their life experiences with them. Vygotsky called this perezhivanie.

> *Perezhivanie* is a unity where, on the one hand, in an indivisible state, the environment is represented, i.e., that which is being experienced…and on the

other hand, what is represented is how I, myself, am experiencing this, i.e., all the

personal characteristics and all the environmental characteristics are represented

in *perezhivanie*. (Vygotsky, as cited in Kozulin, et al., 2003 p. 130)

Students further experienced perezhivanie as they began interacting with other students

within a school environment and learning from their "social others" (Lloyd &

Fernyhough, 1999, p. 6). Learning from "social others" happened in other forms, which

also included play.

Vygotsky believed that play was an important activity in the development of

higher mental functions and that it created a child's Zone of Proximal Development

(ZPD). The ZPD was a concept Vygotsky developed where students, with the assistance

of a more experienced person, could master concepts that they could not have done on

their own. The "social other" was an important aspect of play because children would

imitate or play beyond their level of play. He considered "real" play to be make-believe

play that included role-playing and imaginary situations (Kozulin, et al., 2003). Games

offer these types of play experiences and were a way to provide play beyond a child's

current level of play.

Long after Vygotsky, many educators and educational institutions implemented

programs based on his concepts of socio-cultural theory and Zone of Proximal

Development. Students' backgrounds and experiences should be considered when

planning and designing learning activities for them.

Participating Media and Culture.

Findings from the Pew Internet and American Life Project indicated a trend toward "participatory media" (Lenhart, et al., 2007), which was built on Vygotsky's socio-cultural concepts. "Participatory media" means society used media to share, express, collaborate, and contribute user content. Students have been using technology for these purposes. They have not been interested in the technology itself but, instead, the purposes it has served in their lives. Along with these participatory media applications, MIT professor Jenkins suggested a "participatory culture" has been developing. Jenkins defined participatory culture as "a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices" (Jenkins, Purushotma, Weigel, Clinton, & Robison 2009., p. xi). He believed participatory cultures take the form of "affiliations" (i.e., informal and formal memberships built around various forms of media, which included social networking sites, message boards and gaming communities), "expressions" (producing transformative forms of creative expression such as mash-ups and fan fiction), "collaborative problem-solving" (working in teams to complete tasks and contribute to a knowledge base using a wiki or other collaborative environment), and "circulations" (changing the distribution and flow of media through tools like blogging and podcasting)" (The MacArthur Foundation, 2006, pp. xi - xii). This "participatory culture" changed how students play games, learn, and how teachers implement instruction and technology.

The Pew project found there was a difference between how male and female teenagers utilized the technology (Lenhart, et al., 2007). Male teenagers were more likely to post videos to video-sharing websites and play games, while female teenagers were more likely to create a blog and their own web page. Females (95%) were also more engaged in a wider range of communication activities compared to males (84%). These results distinguished a difference based on gender when it came to Internet and technology use, but all findings supported Jenkins' idea of "participatory culture." Gender is important to consider when planning instruction that implements technology, but the difference in use may not be significant enough to require addressing gender in all technology integration situations.

Schools as Community

Schools have acted as a place for students to be part of a community and to connect with individuals with similar interests and goals. "The notion of school as a learning community is based on shared beliefs, values, and attitudes" (Martin & MacNeil, 2007, p. 1). Martin and MacNeil believed schools created different types of communities with some establishing formal relationships while others established more successful informal interpersonal relationships (2007). Martin and MacNeil believed "…relationships are based on belonging, identifying with place, providing members with security, sense and meaning. The ties that bind us come from sharing with others a common commitment to a set of ideas and ideals" (2007, p. 1). Schools have not always provided students with the type of community they needed in which to be involved and successful. Students may have felt they did not belong because they were unable to

connect with the interests, goals, missions, etc. of the members in the organization. Possibly reinforcing the belief that modern schools have been known as a place for the "collection of material and human resources to be efficiently distributed" to students (Martin & MacNeil, 2007, p. 1).

With schools not fulfilling the need of belonging to a community, students looked for other forms of community outside of school. Other forms of community included non-profit organizations, interest-specific clubs, part-time jobs, online forums, gaming communities, and other social spaces in society.

Online Social Spaces

Findings from the Pew project said that 93% of teens were using the Internet as a place for social interaction (Lenhart, et al., 2007). Online social spaces began in the early years of the Internet with Massively Multiplayer On-line (MMO) games. Since the introduction of MMOs, games have been social in nature, but the way games are social has changed. MMOs introduced the world to online social gaming. The original MMOs permitted players to enter an online environment of text-based role-playing. Players created the story as they played and interacted with worldwide players. Recent games took this concept a step further and players played online in an environment with text, images, sound, and voice interactions. Players played as individuals interacting with other online players or played collaboratively as a team to beat the game. Opportunities abounded for different levels of social play online.

In addition to games, social spaces existed outside of games to support game play. Many of the game companies referred to these spaces as communities because of their

collaborative nature. The online communities typically consisted of forums, news, game merchandise, tips and tricks, links, and other resources. James Gee, however, felt that gaming communities were not so much online communities, but online learning spaces. He referred to the online spaces as "affinity spaces" which were "an important form of social affiliation today, places where effective learning occurs (Gee, 2007a, p. 90). Gee sees an "affinity space" as a space that was created and maintained by gamers or fans of the game. Gamers joined because of their common interest and everyone shared the common space no matter if they were new gamers or masters of the game. The space was an interactive organization where gamers created new content for the game and the content of games changed according to interactions in the space. Intensive and extensive knowledge of the game was encouraged as gamers used and contributed to the knowledge of the game. There were many different forms of participation and everyone could be a leader in the "affinity space." Gee, saw "affinity spaces" as a valuable tool for learning and education because,

> They (affinity spaces) are a form with which young people today are particularly familiar. These young people are in a position to compare and contrast how learning works in such spaces and how it works in schools, not always to the credit of schools. . (Gee, 2007a, p. 90)

He believed the features of "affinity spaces" did or can exist in schools and can lead us to ask questions about how learning occurs in the classroom (Gee, 2007a).

Online gaming and "affinity spaces" lent themselves to a new learning paradigm like that of video games. Video games became non-linear and adaptable by adjusting to

the gamer's skill level, which encouraged exploration, discovery, and fun. There was no teacher but gamers still had access to resources for additional learning. They sought information on an as-needed basis for just-in-time learning. The information they sought came from experienced gamers, online discussion forums, communities, TV shows, or game guidebooks. Marc Prensky also viewed game communities and the social aspects of gaming valuable to learning. He states,

> Game players get good at taking in information from many sources, pulling together data from many places into a coherent picture of the world, and making good decisions quickly. . . . Additionally, as we can all observe, game players become experts at multitasking and parallel processing: i.e., doing more than one thing at the same time and doing them all well. And, increasingly, gamers get good at collaborating with others, over a range of networks. (Prensky, 2006a, p. 9)

Online games were not expected to replace teachers or curriculum but instead to be a tool to enhance instruction and differentiate learning. Not every child was a gamer so games may not appeal to all students. However, with more research and exploration of gamers' socio-cultural context and their attitudes, game designers may be closer to designing educational games to meet the needs and desires of most students.

Attributes of Learners/Gamers

This section looked at attributes of learners and gamers to inform the integration of gaming in a K-12 learning environment. This area has not been fully explored and important information is needed to implement educational games effectively in 21st century learning. Some students desired a certain type of game experience while others

were looking to increase their gamer score. Still for some students, it was about the social aspect.

Gender and Genres

Game genre, based on game content, was another factor used to identify gamers and their preferences of game experience. There was some debate as to whether game genres were gender specific with most being geared toward males, thus encouraging more males than females to be avid gamers. The BBC (Pratchett, 2005) research reported female gamers were playing puzzle, music, and classic (arcade) games, while males were playing adventure, racing, sports, and shooting games. The simulation and role-playing genres were attracting both genders. Entertainment Software Association reported top sales for the genres of strategy and sports, but there was no data as to what gender was doing the purchasing or playing of the games.

Like gaming, there was an ongoing gender debate in education over whether male and female students learn differently. The same debate continued in educational gaming, questioning whether the medium was appropriate for both genders when it came to learning. Prensky believed both genders were playing games, but acknowledged game playing by girls had grown rapidly (and they were missing learning opportunities because they were not frequent gamers). He did recognize that in general, both genders played certain game genres, but there were plenty of crossovers. His recommendation was to not make the mistake of assuming a certain game will appeal to students "…because it has a particular or apparent gender or subject bias" (Prensky, 2006a, p. 180).

Carr's research painted a picture similar to the data reported in Entertainment Software Association, 2007 and BBC (Pratchett), 2005 findings. Females did not necessarily prefer one genre to another. Instead, their selection of games was contextual and influenced by many factors not being reported in the current research. Carr found in her study that females would at times select games based on the game's rules and structures but other times choices would be based on the immediate context of play or the influence of wider cultural influences. In summary, Carr states,

> This indicates that forms of competency underlie and inform our gaming preferences—whatever our gender. In short, preferences are not static: our choices depend on where we are and to what games we have had previous access. Our preferences reflect what we know, who we know, what we have tried, or tired of, and what we will admit to.
>
> Distinctions in taste between male and female players mirror patterns in games access and consumption that spring from (very) gendered cultural and social practices. (2005, p. 478)

This research suggested there was much to consider when designing games for educational purposes. There was a possibility that wider cultural influences may have been more of a determinate than gender when it came to selecting a video game. In addition, gamers' choices of games were dynamic and constantly changing based on their context.

A student's choice of what game they played was not determined by a single factor. However, a combination of contexts within a wider socio-cultural context (Mäyrä,

2007) and changing gamer characteristics determined a student's choice of what game to play and the type of game experiences. Mäyrä's Contextual Game Experience Model illustrated a student's wider socio-cultural contexts including their personal and historical contexts. There were many out-of-game contexts influencing the student's gaming choices and experiences, beginning with the students' wider socio-cultural context, which included the region where they lived, religious beliefs, culture, political views, etc. The next layer of contexts included that of digital game production, which was determined by game companies and students' previous game experience. Immediate social and personal contexts were the context layers closest to the student's game experience. Building upon the model, an additional immediate social context is missing for online contexts because students' are immersing themselves into the online context when playing games online. Therefore, online game play is adding another immediate social context not previously included in the Contextual Game Experience Model.

Factors That Make Games Fun

While genre was one factor that influenced gamers toward playing certain types of games, there were other factors that played a role (i.e., in-game challenges, rewards, graphics, and the extent and ease of social interactions). Two main factors of interest to gamers were in-game challenges and rewards.

In-game challenges were referred to as a challenge, problem, objective, task, or mission. Challenges, objectives and tasks tended to be a stepping-stone to the overall mission or completion of the game. The type of in-game challenges varied from genre to genre and game platform (i.e., PlayStation, Xbox). An example of an in-game challenge

for a game categorized in the shooting genre focused on accuracy, and the player had to

maintain a certain shooting percentage for a designated time. An in-game challenge for a

game classified in the family genre included finding or collecting certain items in order to

expand game play.

In-game challenges were used "to ensure that a good video game operates within

the learner's 'regime of competence'" (Gee, 2007b, p. 67). In other words, the game

provided challenges for the gamer that were hard and challenging but doable, adapted to

the level of the gamer. Gamers may have also selected their level of challenges in a game

by selecting from difficulty levels such as easy, average, hard, or very challenging levels

with each level providing a slightly different gaming experience. According to Gee, a

good game presented the gamer with hard challenges, but gave the gamer time to practice

and master the skills. The game then continued with a new class of problems, which

challenged the gamer's thinking by causing the gamer to rethink what they had mastered

(2007b). The process is repeated many times, as the individual faced new challenges and

as they progressed through the levels of the game (Gee, 2007b). Some gamers have even

beaten a game on one difficulty level and then replayed the game at a harder difficulty

level to experience a variety of challenges.

Game rewards were another factor influencing individuals to play games. There

were two types of game rewards: external and internal (in-game). Game rewards also

varied among genres and platforms and influenced gamers in different ways. External

game rewards have included gamer points, name added to the leader board, and

satisfaction of completing the game. In-game rewards have included unlocking additional

characters or outfits, earning dollars to purchase in-game items, animated movie, and

much more. Game designer, Chris Bateman, placed rewards in the following categories

(2005, para. 2):

- Currency rewards: the acquisition of a game resource that can be spent;

- Rank rewards: the player gains benefits from acquiring points towards an
  eventual step-up in rank;

- Mechanical rewards: such as increases in stats that the player can feel the
  effort of;

- Narrative rewards: a little narrative exposition; and

- Emotional rewards: when players feel they have done something for someone
  in the game;

- New toys: anything new that can be experimented with—primarily a mimicry
  reward;

- New places: a mimicry reward for players driven to explore;

- Completeness: achieving completeness; and

- Victory: defeating a challenging boss.

Like in-game challenges, good game rewards were based on the progress and

difficulty level of the game. Gee gave the following example of rewards based on level of

play.

For example, in a shooter game, after much exploration, I may uncover a spiffy

rifle that I am just thrilled with, since it is so much better than the crowbar I have

been using to fend off enemies, while you, much better at the game than I, may

have found a tank. (2007b, p. 60)

The idea was there were greater rewards for greater effort and continuous play. Bateman

explained that rewards were delivered on one of two structured schedules, ratio or

variable, as the game was played. A ratio schedule "produces high rates of activity—'the

more you do, the more you get'" and a variable schedule "produces constant activity—

'everything has a chance of reward'" (2005, para. 4).

To date there has not been a study that investigated gamers based on their socio-

cultural context and what in-game challenges and rewards influenced them to play. The

Entertainment Software Association conducted research based on game purchases and

listed the 20 top selling video games (2007). While this research reported what was being

purchased, it did not give specifics about who was actually playing the games. BBC's

(Pratchett, 2005) research in the UK explored desired game genre by age and gender but

did not give specify *why* particular game genres were desired.

Reports from previous research suggested different game genres were attracting

different types of gamers; however, much of the information being reported did not go

beyond age and gender. Besides genre, other game factors (challenges, rewards, graphics,

social interaction) should be considered when determining what makes games fun to

play.

Method

Research Questions

This study was designed to describe the relationship between demographic characteristics of high school students playing online games and their gaming social preferences. The following research questions guided the study.

1. What are the demographics of high school students playing online games?

2. What are the social preferences of high school students playing online games?

    2.1. What are the social preferences (mode, friends, relationships, type of interaction) of high school students that play online games when playing offline?

    2.2. What are the social preferences (mode, friends, relationships, type of interaction) of high school students that play online games when playing online?

    2.3. Is there a difference between social preferences of high school students that play online games when playing offline versus online?

3. Is there a relationship between demographics and social preferences when gaming?

    3.1. Is there a relationship between demographics and social preferences when gaming offline?

    3.2. Is there a relationship between demographics and social preferences when gaming online?

4. What do students like about playing games?

    4.1. What do students like about playing games offline?

    4.2. What do students like about playing games online?

    4.3. Is there a difference in high school students' likes and dislikes about playing

       offline versus online?

Survey

     Rationale. In order to develop a comprehensive description of the relationship between demographic characteristics of high school students playing online games and their social preference, a web-based survey was used as the data collection strategy.

     Students often had parent permission when registering for online gaming accounts because they needed to use a parent's email address and/or credit card to establish an account. For example, students who registered for an account with the Xbox Live service (an online game community for the Xbox console) did not require an accompanying parent account (unless the student is under the age of 13), but the student did need a Passport Network account (which is obtained using an email address). The Gold account service needed for online game play contained a subscription fee that students had to pay by credit card or a purchased subscription card. Purchasing game add-ons and additional game content from the Xbox Live Marketplace required a credit card be linked to the account. These requirements gave teens (13-17 years old) access to the game community with the assistance of an adult.

     A web-based survey permitted me to collect data within students' digital world by distributing invites and survey information via online game communities. Other

advantages of using a web-based survey as described by Zanutto included faster response rates, efficiency for sending reminders to participants, and the ability to download responses can be downloaded into a spreadsheet (thus avoiding manual entry of data into data analysis software) (Gunn, 2002).

Introduction. A cross-sectional survey design was used to collect quantitative data. Four questions were asked at the beginning of the survey to verify participants met the requirements to participate in the study.

Forty-three survey questions were close-ended multiple choice with fifteen questions having an open-ended "other" option to be filled in by participants if the listed answer options did not fit their desired response. The online survey began with background questions concerning students' demographics. These questions came first because they required answers familiar to students and provided students time to become comfortable with the survey format. The next set of questions inquired about the student's gaming behaviors and habits and included behavioral questions. The final two questions were open-ended and asked students about what made online and offline games fun for them. Questions in the survey were created with the hope of understanding possible relationships between students' demographics, experience, and game social preferences.

Site Selection. Online gaming is a phenomenon that began with the playing of a computer game, *Warcraft: Orcs and Humans,* in 1994 (Gamespot, n.d.) and recently exploded with video games played online using a console. Not only have consoles allowed gamers to play video games online, consoles have connected gamers to create

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communities. Communities of gamers allow adolescents to compete with worldwide gamers, participate in collaborative game play, track their gaming stats, be content creators of games, and communicate with others. Console gaming communities that existed during this study included Xbox Live using the console Xbox 360; PlayStation Network (PSN) using the console PlayStation 3, PlayStation 2, or PlayStation Portable, and Wii Network using the console Wii or Nintendo DS.

Xbox Live was the most mature service in 2007 (ABI Research, 2007) with Microsoft announcing in December 2011 that their online service had reached 35 million subscribers for Xbox Live (Gilbert, 2011). Xbox Live tended to attract more mature gamers (Keighley, 2006). Online content was free to console users, but a $50 fee was charged for online multiplayer game play (Keighley, 2007). Other strengths of the console included a managed service to avoid cheating and hacking, unified dashboard across games (Keighley, 2007), ease of use (Centre National d'Études des Télécommunications, 2010), social features (e.g., messaging friends, beacons, checking friends' profiles) (Centre National d'Études des Télécommunications, 2010), XNA code available for users to develop their own games (Keighley, 2007), user-created content made available (Keighley, 2007), and backwards capabilities for older console games (Centre National d'Études des Télécommunications, 2010). Weaknesses of the console included a size cap on user-created games, fee to play online, and core console without a hard drive (ABI Research, 2007).

PlayStation Network was the largest online gaming service with 70 million user accounts in 2011 (Schreier, 2011). PlayStation Network average gamer was male and 28

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years old (Dransfield, 2009). Multiplayer games were free to console users. Other strengths of the console included user-removable hard drive, blue tooth for accessories, and blue ray player (Centre National d'Études des Télécommunications, 2010). Weaknesses of the console included no cross game chatting, extra cost for PlayStation Network Plus additional game content, and no backward capability for older console games (Centre National d'Études des Télécommunications, 2010).

Wii Network's number of subscribers is unknown, but Nintendo stated in 2010 that 54% of Wii owners were connected. Based on the NPD Group (formerly National Purchase Diary) 27,998,300 Wii units were sold in 2010, which converts to 15,119,082 subscribers. Wii tended to attract younger male gamers (6 -11 year olds) and older females (25-34 year olds) (Hinkle, 2009). Online content was free to console users. Other strengths of the console included backwards capabilities for older console games, wireless communication with Nintendo DS, system updates while powered down, and simplified controllers (Chamberlain, 2009). Weaknesses of the console included standard definition graphics, no hard drive option, and limited internal flash memory (512 megabyte) (Chamberlain, 2009).

Subject Selection. Online gaming communities serve members of all ages, gender, and ethnicity and provided a large population for the study of online and offline console gaming. The study focused on high school student ages 13-18. The goal of the research was to reach adolescents enrolled in school and involved in next generation game technology. I hoped to gain a general overview of possible relationships among demographics, experience, and gaming social preferences of today's adolescent gamers. I

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hoped the information would inform the design of educational games for effective instruction based on students' demographics and gaming experience.

Many students targeted in the study had to establish online gaming accounts with an adult's assistance. For example, students were able to create Xbox Live accounts without parental permission (only children under the age of 13 need approval from a parent/guardian to create an account), but they needed to own an Xbox console and have an Internet connection. Online game play required payment of a membership fee by credit card or Xbox Live Subscriber Card. PlayStation Network and Wii Network both have a similar process for obtaining online gaming accounts.

The goal was to obtain two hundred online gamer participants for the sample to represent gender, race, and gamer experience of students. Two hundred thirty participants completed the survey.

A call for participation was conducted using online game forums. These virtual environments were chosen because of their active role in the gaming community and member participation in web site forums and included gameinformer.com, Gamertag.com, Xbox360achievements.com, Gamertagpics.com, PMS/H20 Clan, Planet Xbox360, Raptr, and 3D Game Lab. Online gaming communities made it possible to connect with gamers in their domain. Game community members were also reached through Twitter using the following hash tags: Xbox, Xbox360, PlayStation, Wii, videogames, Nintendo, and Kinect. However, response rate to the survey was low, and I re-evaluated posting of calls for participation in game communities. After the initial request for participation, I found a report stating that 88% of teens do not contribute to

gaming communities (Pew, 2008). As a result, Twitter postings and hash tags were added to reach the gaming community. Along with a call for participation, I relied on the snowball technique for obtaining participants.

Once participants agreed to participate and completed the survey, several responses were member checked by accessing gamer profiles on Xbox Live to verify active gamer status.

Unit of Analysis. Research questions framing this study focused on gaming's social features preferred by high school students playing online games. Two sets of variables included the demographics of individuals and individual participant's gamer experience. A third set of variables surveyed gamer preferences, asking participants to respond to factors reported in the literature to be factors influencing gamers to engage in hours of game play. Therefore, the unit of analysis is the individual.

Research Relationship. I entered the relationship as a fellow gamer and researcher. I introduced myself using my gamer tag profile as a doctorate student when posting calls for participation in the various forums. I hoped this would establish a non-intimidating relationship. When participants expressed an interest in participating, I provided an overview of the research and my contact information. Participants were then asked to complete the online survey.

Instrument. Evaluating gamers' play experience and behavior is complex. Computer games constitute complex socio-technical behavior settings that permit diverse player behaviors based on gamers' decisions, strategies, and goals, their use of various game objects such as weapons or other resources, and their

competitive or cooperative interactions with other players or with computer-

generated game characters. (Clarke & Duimering, 2006, p. 1)

As a result, little is known about the gaming experience, and there were no

existing instruments for evaluation purposes. Several instruments have been used to

collect data about gamers, but each had limitations. Usability tests, surveys, and focus

groups have been used to evaluate attitudes and perception of gamers toward games but

"fall. . . short in providing adequate information…" (Davis, Steury, & Pagulayan, 2005,

para. 2). In addition, usability tests usually involve typically small sample sizes that do

not lend themselves to representing a wider population sample, while surveys tend to

collect large amounts of data from a wider sample but are typically removed from the

gaming experience and do not always obtain accurate data (Davis, Steury, & Pagulayan,

2005). However, several researchers (Davis, Steury, & Pagulayan, 2005) suggested that a

combination of tools and methods would facilitate collecting valuable data.

Observing gamers in their gaming environment is not feasible because gamers

play online from their homes and other locations. Therefore, in this study, an online

survey was used to obtain data about gamers' perception and play experience while Xbox

Live data was used for random member checking. (Xbox Live reports data based on

gamers' online and offline game play.)

Game Features and Demographics Survey (GFDS)

Purpose. After a review of the literature was conducted, I created the GFDS was

created. The literature review included other documents in the digital and gaming fields

such as Entertainment Software Association's *Essential Facts About the Computer and Video Game Industry* (2007), Project Tomorrow's *Speak Up* (2008), and *Sociocultural Contexts of Game-Based Learning* (Ito, 2009). Other areas outside of education were researched and included peer-reviewed journals in marketing, science, computers, pediatrics, game research, and online media. Interviews of members from the console maker companies of the Xbox, Wii, and Playstation were viewed and contributed to the study. In addition, international news releases and journals were reviewed. The literature reviewed spanned the years 1998-2012 and focused on topics of video and computer games, online and educational gaming, socio-cultural context, and social media. Searches were conducted for the literature review using the descriptors game studies, games and learning, gender and games, socio-cultural, digital media, military and games, consoles and companies (Xbox, Microsoft, Wii, Nintendo, Playstation, Sony), educational games, online communities, social spaces, game features, digital divide, and game genre.

The literature review revealed that research has been conducted based on the socio-context within games but not the socio-context of the gamer. Other studies described basic information about gamers' game genre and general gaming preferences, but no in-depth research explored game factors and features of various games. One study identified purchasers of games (Pratchett, 2005), but not persons actually playing the games. Other studies observed the gaming behaviors of small specific groups of students in a controlled environment. However, this study was designed to reach a larger group of students to look at their demographics and their gaming social preferences.

The survey, GFDS, is a researcher-created tool delivered in an online format. The survey targeted 13-18 year olds and was designed to gather information about the social gaming preferences, gaming experience of gamers, level of involvement, demographics, and what gamers liked about online and offline games. This survey met my needs because it reached a large demographical area of online gamers. An online format was selected because the targeted sample had an online presence and was most accessible within this environment.

Construction. I designed the GFDS based on the literature. The survey contained 43 closed-ended questions. Section I collected demographic information to identify and verify that respondents fit the target sample for the study. Section II gathered information to identify students' gamer experience and social preferences for offline gaming. Section III gathered information to identify students' gamer experience and social preferences for online gaming. Section IV collected information about what students found fun in online and offline games.

To answer research question 1 concerning demographics of the participants as an online gamer, four multiple-choice questions addressed participants' gender, race, and age. Questions requiring three to five answer options were presented in a multiple-choice format. Several questions contained an *Other* category for answers not covered by the listed answer options.

Section II contained twenty-one multiple-choice questions and one Likert question about students' experience and social preferences when playing online. Questions addressed years playing online games, type of gamer, time playing games

online each day, and game social preferences when playing online. Several questions contained an *Other* category for answers not covered by the listed answer options. Data from this section were used to conduct descriptive analysis for research questions 1, 2, and 3, and cross tabulation analysis for research questions 2 and 3 when determining differences of social preferences.

Section III contained eighteen multiple-choice questions and one Likert question about students' experience and social preferences when playing offline. Questions addressed years playing offline games, type of gamer, time playing games offline each day, and game social preferences when playing offline. Several questions contained an *Other* category for answers not covered by the listed answer options. Data from this section were used to conduct descriptive analysis for research questions 1, 2, and 3, and cross tabulation analysis for research questions 2 and 3 when determining differences of social preferences.

Section II of the survey ended with an open-ended question asking participants what they considered fun about playing online games and section III ended with an open-ended question asking participants what they considered fun about playing offline games. Qualitative data analysis was used for results of the two open-ended questions to answer research question 4.

The GFDS is available in a digital format only and is disseminated using a commercial online survey tool, surveymonkey.com. A paper version of the survey can be found in Appendix B.

Validity and Reliability

A reliability test was conducted with ten student gamers at an Arizona high school. Wording in two questions was modified to clarify the questions for teenaged students. The average completion time for the survey was ten minutes, with the longest completion time of fifteen minutes. Sections containing Likert questions appeared to be a bit long for the students, so Likert questions were subsequently omitted by breaking down the content into simplified multiple-choice questions.

A panel of experts assisted with the validity of the GFDS. Two academics, Dr. Priscilla Norton and Dr. Kevin Clark, reviewed and approved the GFDS for piloting. Two game experts, Mr. Michael Belcher and Mr. Herb Shaffer, reviewed the GFDS instrument for clarity and terminology and provided recommendations for improvement before piloting of the instrument. A final version of the instrument was prepared for data collection.

Procedures

The abstract and protocol of the study, the proposed call for participation and email invitation to participate, proposed informed assent, and proposed survey instrument were submitted to the Human Subjects Review Board (HSRB) for review and approval. George Mason University's Office of Research Subject Protections granted approval for this study on December 5, 2011, protocol number 7834. The approved informed assent and survey instrument are located in Appendix A and B, respectively.

Data Collection

I collected data using the online GFDS. The first step in data collection included solicitation of students using a call for participation. A description of the research project was posted on several forums in different virtual communities to obtain a variety of students. Interested students were then directed to the online GFDS via a URL. Embedded in the survey was the HSRB approved consent form. Students were asked to read the letter of consent and check a box indicating they had read the consent and were willing to participate. Students then proceeded to take the GFDS, and all data were entered into a database for analysis.

The survey was quantitative in nature to address the research questions. Survey questions began with addressing students' demographics, continued with questions about their gaming experience, and ended with questions specific to their social game play preferences.

Data Analysis

All data from completed surveys was entered into SPSS for analysis. This study used descriptive and cross tabulation research methods to answer the four research questions. Research question 1 used descriptive research methods because descriptive statistics are "used to classify and summarize numerical data; that is, to describe data" (Hinkle, Wiersma, & Jurs, 2003, p 12). This method was used to simplify and summarize the data to get a feel for what the data say about gender, race, years of experience, and time spent playing games. Frequency tests including mode were ran using descriptive analysis in SPSS. The data were also visualized using a batch IP locator

(http://batchiplocator.webatu.com/) and Google Map software to map the geolocation of participants completing the GFDS. "Geolocation by IP address is the technique of determining a user's geographic latitude, longitude and, by inference, city, region and nation by comparing the user's public Internet IP address with known locations of other electronically neighboring servers and routers" (Turner, 2004, para. 2). The purpose of visualizing data by geolocation is to provide a deeper understanding of geographical context of the participants.

Research question 2 used frequency tests in SPSS to measure the frequency of social preferences (i.e., collaborative or team play, others present in the room, in-game communication tools) of participants and to determine if there was a difference in social preference for online or offline game play. The second part of research question 2 required cross tabulation analyses. Research question 2 had one predictor variable for type of play (online play and offline play) and six criterion variables: mode of play, presence of others, type of gamer, time playing games each day, communication with others, and communication tools used when playing. Each criterion variable was analyzed to see if a relationship existed between the predictor variable and the criterion variables. Cross tabulations were run using Chi-square analysis in SPSS.

To answer research question 3 the cross tabulation method was used to determine if any relationship existed between variables. Cross tabulations were conducted between each of the three predictor variables (gender, race, and years of experience) and the criterion variables (mode of play, presence of others, type of gamer, time playing games

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each day, communication with others, and communication tools used when playing).

Cross tabulations were performed using Chi-square analysis in SPSS.

Research question 4 used qualitative data analysis to get a better understanding of participants' gaming preferences. Data was printed from SPSS and placed in categories by topics for online and offline play. Frequency measurements were used to determine categories of importance to participants. Categories and frequencies within categories were used to determine differences in what participants thought was fun about playing games online and offline.

SPSS was used to compute statistical results, and batch IP locator (http://batchiplocator.webatu.com/) and Google Map software to map the geolocation of participants completing the GFDS.

Limitation of Study

The limitations of the study include self-reporting, honesty of responders, volunteerism, and language version of survey. Student participation was voluntary so there was no guarantee that a certain number of surveys would be completed. Data were self-reported, and surveys were completed from the perspective, opinions, and judgment of the student. Self-reporting is a limitation because there may be a difference between what students believe to be true and actual practices or behaviors of the student. In addition, honesty is a limitation when data are self-reported. Students may not want to report correct data because the real data may not be as impressive (i.e., time spent playing games). The GFDS was only offered in an English language version, which may have

limited students' ability to participate in the study since Xbox Live Subscribers are from

26 countries.

Findings

Introduction

      This study investigated demographic characteristics of high school students that play games online and their social preferences when playing offline and online. This study was designed to serve as a starting point for understanding how students communicate when playing games.

      The online Game Features and Demographics Survey (GFDS) was developed for the study with the intention of reaching students through online game communities. Questions on the survey asked students about their personal and gamer demographics, social preferences, and communication practices while playing offline and online games.

Organization of Results

      This chapter addresses the research questions and concludes with a summary of the findings. Research questions in this study were answered using several different analysis strategies. Demographic and social preferences research questions were answered using descriptive analyses. Questions pertaining to differences between social preferences when playing online versus offline and relationships between demographics and social preferences used cross tabulation. The last research question addressing what students like about playing offline and online games used qualitative analyses.

Response Rates

Three hundred students attempted the GFDS and 230 students completed the survey. Forty-seven percent of participants that did not complete the survey terminated the survey when asked to enter their gamertag for validation purposes. After the data was cleaned for usable data, 180 students (n=180) are represented in the findings. Response rates were lower than anticipated, which might be explained by a decline in the number of students frequenting online game communities—88% of students ages 13-18 no longer frequent online game communities (Pew, 2008).

Descriptive Characteristics of Participants

Research question 1 asked: What are the demographics of high school students playing online games? Descriptive statistics were used to summarize characteristics of participants in this study.

Requirements to participate in the study included an age in the range of 13-18 and enrollment in school. There were 180 participants in the sample; they were predominately male (84%, n=151) and White (73%). The distribution of race is summarized in Table 1. Though several race groups had low response rates, I believe there is enough information to further explore the social preferences of these groups. Groups may be using games in different ways to fulfill social needs.

Table 1

Distribution of Participants by Race

Race	Percentage
African American[a]	1.1
Asian	6.7
Hispanic	7.8
More Than One Race	7.8
Native American[a]	0.6
Other[a]	3.3
White	72.8

[a]Categories of African American, Native American and Other (Arab, Australian, Iranian-American, and Pacific Islander) were pooled into one category of Other for analysis because of the issue of small sample size in each category.

Figure 3 provides a map of participants based on the IP address used to access the

GFDS survey. A batch IP locator (http://batchiplocator.webatu.com/) and Google Map

software was used to map IP addresses of participants representing 61 different cities.

Figure 3. Map of participants responding to survey.

Those completing the survey reported being more experienced playing games offline (59% with seven or more years of experience) than online (28% with seven or more years of experience). Participants varied among daily, weekly, and monthly play frequencies but of those who played games daily, 41% of them played online and 29% played offline. Fifteen percent of participants did not play offline games and were only online gamers.

Hours spent gaming was grouped into three categories based on Jansz and Martens' (2005) research of people attending a local area network (LAN) gaming event. Categories were based on the following criteria:

- casual gamer: average game play of one hour or fewer daily;
- serious gamer: average game play of 2-4 hours daily; and

- excessive gamer: average game play of 5 or more hours daily.

The distribution of participants by category is summarized in Table 2 with the largest percentage of students (53%) being casual gamers. Participants fitting into the casual category of play frequency may consider gaming as another way to relax and spend time with friends. Like other technologies, adolescents are more interested in the practical functions of the technology than the technology itself. Time spent gaming is more about fulfilling social and mental needs instead of the technology behind the game or the intricacies of the game. Excessive gamers are more interested in these intricacies of the game often playing and beating the game multiple times as different characters or on different levels of difficulty.

Table 2

Distribution of Participants by Category

Gamer Category	Offline Percentage ($N = 152$)	Online Percentage ($N = 180$)
Casual	69.0	52.8
Serious	23.0	33.9
Excessive	9.9	13.3

Gaming Social Preferences

Survey questions asked participants about their social preferences for playing offline and online games. The majority of participants in the sample preferred to play online (86%) instead of offline (14%), and they did not play in isolation as defined by

their answers to social preference questions. Adolescents are playing online and offline because of the collaboration opportunities. Social preferences considered in this study included mode of play, preference for offline or online gaming, communication tools, and communication topics.

Research question 2 asked: What are the social preferences of high school students that play online games? Descriptive statistics were used to summarize the gaming social preferences of participants.

Participants were asked about their preferred mode when playing online. Modes of play included: against another gamer, alone, and collaborative or part of a team. Seventy-one percent of participants preferred to play collaboratively or as part of a team. The distribution of participants by mode of play is summarized in Table 3.

Table 3

Distribution of Participants by Preference of Collaborative Play

Mode of Play	Percentage
Play Against Another Gamer	20.6
Play Alone	8.9
Play Collaboratively or Part of a Team	70.6

Although a majority of the participants reported their preference to play collaboratively or as part of a team while online, they were not always successful in teaming with other players to play collaboratively. Fifty-three percent of all participants

reported being able to connect with other gamers to play collaboratively or as part of a team on a weekly basis. Not being able to connect with other gamers for collaborative play was probably a result of their friends not being online at the same time and participants not wanting to play with people they have never met. The same scenario occurred when playing offline. Participants' preference was to play collaboratively but several participants identified the coordination of schedules and a location was often challenging for playing in person.

Previous research (de Kort, IJsselsteijn, & Gajadhar, 2007) found that most gamers do not play games in isolation, and other people were typically present in the room when participants played games. This study found this to be true with 70% of participants reporting people present in the room with them. This study expanded on people present in the room by asking questions about who was present and the activities of the people present as related to game play. People most often present in the same room included siblings (45%) and friends (54%). People present in the same room were actively engaged in the participant's game play (67%) by either playing against/with the participant or watching and giving the participant game advice.

People in the room were not only active in the participants' game play but also communicating with them. For instance, when playing offline games 72% of participants reported talking with people in the same room, which included their siblings (55%) and friends (61%), but when playing online games they talked more with people online (67%), which also included friends (66%), but in addition people they have never met in person (67%). (Interestingly, participants do not consider people they have met online

and not in person as strangers.) For many participants, when they were playing games offline the people in the room were more actively involved in the game play than if the student was playing online. Suggesting that playing online often makes it harder for people present in the room to be involved in the game play. Summarized in Table 4 is the distribution of people in each location that participants conversed with while playing games.

Table 4

Distribution of Others With Whom Participant Communicated During Play, by Location

Location of Others	Offline Percentage ($N = 152$)	Online Percentage ($N=180$)
In Same Room	71.7	60.0
Different Location	20.4	48.9
Online	23.7	67.8

Eighty-five percent of participants in the study communicated with others while playing online. While playing online, 41% of participants talked about game strategy. But offline, 32% of participants talked about non-game related topics and 30% talked about game strategy.

Tools for Communicating While Playing Online.

In the review of the literature, I did not find research addressing how students communicate with other people while they played online games. Therefore, I asked

participants about their communication preferences when playing online. Survey

questions addressed phones and in-game communication tools while also including an

Other answer option for tools not listed.

Participants reported using communication tools more often for online game play

than offline game play. Participants were surveyed on how they used their phones for

communication purposes when playing and to select all the answer options that applied;

these included using their voice to talk, sending text messages using a short messaging

service, video chatting using the camera built into the phone, and group chat on their

phone involving more than two people. During online game play, phones were used by

61% of participants to talk, and by 66% to text, and all race/ethnic groups reported using

their phones for texting more than talking. Table 5 summarizes participants' use of

phones for communicating while playing offline and online games.

Table 5

Distribution of Participants by Phone Use

Tool	Offline Gaming Percentage ($N = 152$)	Online Gaming Percentage ($N = 180$)
Talk	53.9	60.6
Text	60.5	66.1
Video Chat	7.9	10.0
Group	6.6	9.4
Don't Use	9.2	7.2

Many video games have communication tools built into the game itself. Survey questions asked participants about their use of in-game communication tools that included instant text messaging (a short messaging service), audio chat using a headset with a microphone, video chat using a camera that plugs into the console, and messaging tools that resemble email.

Audio chat was the most common in-game communication tool reported by participants for online (61%) and offline (40%). Audio tools tend to be the easiest to use for communication while actively playing gamers. Participants also like hearing the voice of others making the experience more personable. In-game text chatting and messaging were also tools of choice for communicating both online and offline. Table 6 summarizes participants' use of in-game communication tools while playing offline and online games.

Table 6

Distribution of Participants by Use of In-game Communication Tools

Tool	Offline Gaming Percentage ($N = 152$)	Online Gaming Percentage ($N = 180$)
Text Chat	35.5	50.6
Audio Chat	39.5	60.6
Video Chat	8.6	10.0
Messaging	34.2	51.7
Don't Use	12.5	4.4

Thirty-two percent of participants reported using other chat tools when gaming including TeamSpeak, Ventrilo, Skype, Xfire, and Facebook chat.

Social Preferences and Demographics

Research question 3 asked: Is there a relationship between demographics and social preferences when gaming? Pearson's Chi-square test was used to determine any significant relationship to demographic variables in this question. Demographic variables included gender, race, and gaming experience. Because the data set was small for several race and years-of-experience groups, the Exact method was used to calculate the exact p value based on Pearson's Chi-Square statistics.

No matter participants' gender (χ^2 (1,N=180)=1.62, p=.164, chi-square test) or race (χ^2 (4, N=180)=4.63, p=.322, chi-square test) grouping, participants preferred to play online games instead of offline games. The percentages for each variable are summarized in Table 7 by preference for offline and online game play.

Table 7

Distribution of Participants and Preference of Play

Gender/Race	*N*=	Offline Percentage	Online Percentage
Female	29	20.7	79.3
Male	151	11.9	88.1
Asian	12	8.3	91.7
Hispanic	14	0.0	100
More Than One Race	14	14.3	85.7
Other	9	0.0	100
White	131	16.0	84.0

Table 8 looks at race and online gaming experience. There were no significant relationships based on gender, but relationships were found with the race and game experience variables. There was a significant relationship between race and years of online gaming experience. Asian participants in this study had the most years of experience as online gamers with 67% of Asian students having 7+ years of experience. Cross Tabulation are shown in Table 8.

Table 8

Cross Tabulation of Race and Online Game Experience

Race	1-2 Years Percentage	3-6 Years Percentage	7+ Years Percentage
Asian	16.7	16.7	66.7
Hispanic	28.6	50.0	21.4
More Than One Race	7.1	42.9	50.0
Other	22.2	66.7	11.1
White	19.4	56.5	23.7

In addition, there is a relationship between online gaming experience and game play frequency. Sixty-four percent of participants with 7+ years of online gaming experience reported they played games online daily while only 20% of participants with 1-2 years of experience played daily (χ^2 (4, N=180)=18.53, p=.001, chi-square test). A majority of participants with 1-2 or 3-6 years of experience, reported playing games weekly. Table 9 displays percentages for participants based on years of gaming experience.

Table 9

Cross Tabulation of Online Game Experience and Play Frequency

Race	Daily Percentage	Weekly Percentage	Monthly Percentage
1-2 Years	20.0	60.0	20.0
3- 6 Years	36.8	50.5	12.6
7+ Years	64.0	30.0	6.0

Use of Communication Tools While Gaming

Based on suggestions for future research in the literature, this study asked questions to expand on participants' use of communication tools when gaming.

There was a significant relationship between years of offline gaming experience and talking while playing online. The more experienced a participant is as an offline gamer, the more they used communication devices and applications to talk with other people while playing online (χ^2 (6, N=152)=15.82, p=.026, chi-square test). Asian participants were the most active communicators (talking a lot 67%), and Hispanics were the least active communicators (29% talking a lot) when playing online (χ^2 (12, N=180)=42.84, p=.001, chi-square test). Relationships were also found between race and to whom participants communicated with while playing online. Thirty-six percent of participants selecting "More Than One Race" as their race group were most likely to talk with people they have never met in person, and White participants (5%) were the least likely to talk with people they have never met in person.

Significant relationships were found among gamer experience and communication tools. Participants varied in their selection of communication tools when playing offline based on their years of online gaming experience. There was a relationship between years of experience and using the phone as a communication tool. Fifty-seven percent of participants with 3-6 years of experience used the phone for talking, while less experienced gamers (31%) and more experienced gamers (35%) reported less talking on (χ^2 (2, N=180)=10.39, p=.006, chi-square test).

The percentage of gamers using the phone during gaming, by years of experience, are summarized in Table 10.

Table 10

Cross Tabulation of Participants by Gaming Experience and Using Phone to Talk

Online Gaming Experience	No Talk Percentage ($N = 180$)	Talk Percentage ($N = 180$)
1-2 years	13.3	6.1
3-6 years	2.8	30.0
7+ years	18.3	9.4

There was also a relationship between using the phone for video communication when playing online and participants with 7+ years gaming experience (χ^2 (2, N=180)=6.06, p=.046, chi-square test).

What Participants Like About Playing Games

Research question 4 asked: What do students like about playing games offline and online? This question was answered with two open-ended questions, which did not require answers by participants. Of the 180 participants, 171 participants answered one or both of the open-ended questions.

Seven themes were identified for what participants liked about playing online games. These were: play partners, meeting new people, friends, competition, artificial intelligence, escapism, and collaborative play. Four themes were identified for what participants liked about playing offline games. These were: personal achievement, storyline, solitary play, and playing games in person with others. The themes are described below.

Play Partners. Participants cited convenience and accessibility as reasons they liked playing online games. Being able to connect with other players around the clock and world was a reason participants gave for liking online games. "You can play almost anytime, at anything, and you always have someone to play with" and "play with other characters that have skill when no one else is with me." Participants' comments, "That I can play with other people without needing a second controller or having to share a screen" and "I can play with my friends or with others without a complicated set up or meeting" addressed the convenience of accessing and playing with people online.

Meeting New People. Participants liked the ability to connect with the video gaming community and people of like minds to meet new people (21%). One participant commented they liked, "The connection you receive with the world through one common

interest." Another participant stated, "Being able to meet new people and possibly befriend them" was a feature of online gaming they appreciated. Participants were using online gaming to fulfill part of their social needs by meeting new people and building friendships.

Online Friends. Staying connected and playing with friends was a main reason for participants (11%) playing online. Two participants summed up the desire of participants to stay connected across long distances with friends. "I can play with my friends from my old home town which is about 1,000 miles away" and "It's amazing how far technology has come, to where you and your friend can be in different countries, yet still raid together every Tuesday night." Another participant talked about online friends that she has never met in person and the strong relationships she has developed with them,

> "My online friends are really the closest friends I've ever had, and we talk on the phone, Skype, and text like 'real' friends do. We hang out more than I ever hang out with my friends irl [in real life]."

Even though participants liked connecting with friends, they also liked playing offline games because it gave them the chance to play with other people in person. As one participant stated, they played offline games because they liked "being in the room with friends talking and working with people you can see." In addition, one participant felt he could include people that would not otherwise play games. "Usually, offline games are games that a wide age group of people can play (some elders or parents would rather play a board game than online games)."

Online Competitiveness. Participants liked challenging themselves with competition through online gaming. Some participants competed for the sole purpose of "playing against other people to get better," while other participants played by "gaming competitively, using strategy and assertiveness" for measuring their skills and success. "It gives you an actual challenge against other people, not just a computer generated person. It's more psychologically satisfying to know that you've beaten someone instead of an inanimate computer program." Other participants liked to see their success visually by "being able to finish at the top of the lobby with the most points/kills" and "earn achievements."

When participants did not want to play competitively, they opted for playing solitary games like *Skyrim*, *Mass Effect*, and *Final Fantasy*. Participants liked these games because the play was "not so competitive," "you don't have to worry about interacting with other people," and "being able to explore a world without having to worry about others getting in your way (*Ahem*, *Bioschock*, *Fallout*, *Elder Scrolls*, *Borderlands*, and *Red Dead Redemption*)."

Online Artificial Intelligence. Participants tiring of the artificial intelligence of offline games looked to online games for extending

> "the life of a game indefinitely. It provides a changing experience because you are not playing through a 'rail system' set by the company but an environment that adapts based on who is playing. It can be challenging to play the game against a thinking mind instead of Artificial Intelligence."

Other participants supported the idea of online games making them think differently with comments such as, "I like that they [game developers] challenge me to think outside the box with different levels" and provide "brain exercises in a sense." Improving participants' game play continued to be a common thread because participants were "observing other user's gaming habits and strategies" and "using those strategies to better" themselves.

Escapism. Escaping reality was another reason for liking online games. Participants liked the opportunity to be who they wanted. For example, one participant stated, "The escapism, you're able to leave everything behind and enter a satisfying, awesome fantasy world in which you can be whoever or whatever you like." Escaping and being accepted was also important to this participant, "well to sum it up, being able to be in my own world where people think like me and accept me."

Collaborative Online Play. "I specifically enjoy the gaming experience; working with others and learning how to solve problems or become a team player." Collaborative game play was valuable to participants because they connected with friends, but also for "having a cooperative storyline." Participants liked the storyline of games including the storyline of games designed for individual play. "The games are generally structured around a story and individual experience crafted for the player whereas in online games, it most be build [sic] for many people wanting to do the same thing (often competitively)." Storylines in solitary games "allow. . . you to follow a specific storyline rather than just wandering aimlessly" and "let. . . you get more immersed in the story." "Certain games are just meant to be played alone, I often consider games like a book and

you rarely read books in groups." "At some point, you become completely absorbed. Horror games make you fear for your life, role-playing games make you feel what the main character is feeling." "You can really get to understand a character through the story. It's like reading but actively participating in the story."

Outliers. Outliers in participant responses included making money and studying the psychology of other players. Two participants made money by making "COD [*Call of Duty*] videos for money" and "I have done online jobs and type of business with them. Including game server hosting, programming websites, games, and programs etc." Concerning psychology of other players,

> "I like to create my character from scratch and make my own character. In a
> sense, I also use it for studying the psychology of people and reading people
> based on their voice and so on. I play video games for stress relief, brain exercises
> in a sense, studying others, and meeting new people."

Summary. In summary, participants liked playing games for different dynamic reasons. Sometimes they wanted a solitary game experience; other times they liked a competitive game experience. Participants were not always concerned about the gaming experience but just wanted to connect with friends or people of similar interests. Participants used several different tools to connect and communicate with people that shared a common interest in playing video games.

Summary

Summary of the Study

     This study examined the relationship between the self-reported demographic characteristics of high school students that play games online and their social preferences when playing offline and online. This study was designed to be a starting point for understanding how students interact when playing games and how this type of engagement might be transferred to formal learning situations and inform the design of educational games.

     Review of the literature concerning video games has focused on who is playing games and the learning potential of games with little recommendation for design of educational games or implementation of commercial video games in educational settings. The average age of gamers has been identified as 37 years with only 18% of gamers under the age of 18 (Entertainment Software Association, 2011). However, Pew's Internet & American Life Project, Cable in the Classroom/Teen Citizenship Survey, reported 85% of adolescents (12-17 years old) play video games (Lenhart, et al., 2011). If one study reported only 18% of gamers were adolescents, but another study reported 85% of adolescents were playing video games, the question still remains, "Is the average age of gamers 37?"

The literature review showed adolescents played games based on the dynamic context in which games were played. Playing games provided a social and interactive space for adolescents. Future research was recommended to more deeply explore the context in which adolescents play games and what features of games make playing games fun. Understanding these features can then be used to inform the design of educational games to improve learning outcomes.

Subjects were 13-18 year olds enrolled in school who played online games. An online survey was used to collect data from participants, and calls for participations were posted in online game communities. Two hundred thirty participants completed the survey, and 180 surveys contained usable data.

The four main research questions answered in this study include:

1. What are the demographics of high school students playing online games?

2. What are the social preferences of high school students playing online games?

3. Is there a relationship between demographics and social preferences when gaming?

4. What do students like about playing games?

Conclusions From Statistical Analysis

Most Participants Were Casual Gamers. Participants in the study were 13-18 years of age, enrolled in school, and online gamers. They were predominately male (84%) and White (73%). This study found 42% of participants played online video games less than one hour a day, identifying them as casual gamers (based on criteria from the literature (Jansz & Martens, 2005). These percentages may add to the conversation about

the average age of gamers as reported by Entertainment Software Association (2011) and Pew, who both indicate 85% of adolescents (12-17 years old) play video games (Lenhart, et al., 2011). Adolescents playing video games under an hour a day may consider themselves as casual gamers and not serious or excessive gamers. Past research may not have considered these casual adolescent gamers as dedicated gamers and thus without much influence in the commercial gaming market. Pew research takes a different approach and looks at adolescents' technology use as support for furthering the education of all adolescents. It is probable that the Entertainment Software Association and Pew used different criteria for identifying adolescents as gamers was likely different in these two studies.

Collaborative Play. Participants in the study reported a preference for playing online (86%) versus offline (14%) and playing collaboratively or as part of a team (55%). Whether playing offline or online, participants preferred collaborative play with other people versus playing alone or against the computer. This data supports Pew's findings that 93% of teens are using the Internet as a place for social interaction (Lenhart, et al., 2007). Participants also liked the ease of online games to connect with other people and enable collaborative play when they could not play locally with friends. Participants were using the gaming technology to connect with people of similar interests at their convenience. Playing online permitted participants not only to find other people with common interests, but also to interact socially with others while playing as part of a team.

Presence of Others. This study expanded on the topic of playing in isolation, and findings of this study supported the findings of Olsen, who reported "three-quarters of

teens play games regularly with other people, either online or in person" (2008). Not only were participants playing collaboratively online, but siblings and friends were present in the room while participants played. Sixty-seven percent of participants reported siblings and friends were actively involved in game play either by operating an additional game controller or by giving verbal advice as participants played. One participant even mentioned being able to play games with people present in the room who may not otherwise play games online because online games were too complex. Playing games is no longer an isolated activity but a social activity/event for families and friends.

Tools for Communication. Participants reported using phones and in-game communication tools to talk with other people while playing games, supporting Wan and Chiou's (2006) research that adolescents satisfy social needs while playing online games as well as Pew's (Lenhart, 2012) claim that "teens are fervent communicators." Forty-one percent of participants said they talked constantly when playing online games while 44% talked occasionally. If participants were playing offline games, 72% of participants talked to people present in the room. However, if participants played online games, 68% were talking to people online and 60% talked to people present in the same room. The percentage of participants communicating while playing games suggests that adolescents were meeting some of their social needs. Are adolescents communicating while they play games or playing games to communicate?

Texting was the most common form of communication, whether participants were playing offline or online, and talking on the phone was the next most popular method of communicating. Texting is on the increase with 75% of adolescents texting daily and the

average number of texts rising from 50 in 2009 to 60 in 2011 (Lenhart, 2012).

Participants demonstrated in this study that texting was a preferred method of communication even when playing games, so texting spans adolescents' activities and daily routines. The most used in-game communication tools were audio chat and text chat, mirroring phone use. Another common tool was in-game messaging, which is delayed text messaging (asynchronous communication). Adolescents were using these tools to talk about game strategy and non-related game topics while playing games. Very few participants were interested in learning about the other gamers suggesting adolescents use the opportunity to learn from one another and talk about topics of interests. Educational games and activities often do not build in a component for these types of conversations. Encouraging and planning for conversation can take students' learning to another level or in a different direction than the student or teacher originally planned.

Culture and Perezhivanie. Findings suggest that culture may influence the way adolescents decide to play and experience a game. In this study, Asian participants reported they talked frequently while Hispanic participants reported talking the least. My initial thoughts considered the language barrier as a possible reason for Hispanic participants talking less but the most talkative participants were Asian participants who might also be impacted by the language barrier. In addition, game consoles and communities like Xbox Live have private party chats permitting gamers to talk with friends or other people speaking the same language. (The private party chat removes gamers from the public lobby chat so they are only talking with a specific group of

people.) The more I tried to understand why Hispanic participants were less talkative than Asian participants the more I believe Vygotsky's perezhivanie is at play. Perezhivanie, mentioned in the literature review (p. 10), states that each individual experiences the environment based on that individual's previous experience including personal and environmental characteristics. Therefore, Hispanic and Asian participants likely experience video games and use communication tools based on their personal and environmental characteristics.

Interested in how Vygotsky's perezhivanie might be at play I continued the conversation with a peer educator and Mexican-American, Ray Ostos. From a personal perspective, his thoughts were that the Latino population is so diverse that it would be hard to generalize how the adolescents in this study and the population as a whole participate in online gaming. For instance, Mexican-American students may bring different personal and environmental characteristics than students of Cuban, Puerto Rican, or Dominican backgrounds. Ray Ostos doubted language was a barrier because many students are bilingual and bicultural. However, he believed that immigration status might be a factor because "if someone has family members that are not in the country legally, they will not communicate with strangers". In addition, he stated there are probably some cultural influences when speaking to strangers because "growing up, we kept conversations, asking for help, within the extended family" (R. Ostos, personal communication, June 21, 2012).

Vygotsky's perezhivanie may start to explain how adolescents play and experience video games based on their culture and personal characteristics. Additional

research would need to be conducted to further measure the role of perezhivanie in social preferences of students when playing games online.

Gamer Experience. Relationships between variables were more prominent with the variable, years of gaming experience. I did not find relationships between gender or race when cross tabulating them with the criterion variables. It would seem, then, that game experience influenced criterion variables more than gender or race. However, one observation in the data challenges this finding of no relationships between race and criterion variables. Asians were the participants that talked the most while playing online games; so a question remains, does the relationship exist because of race or because Asians have the most gaming experience?

Participants with 3-6 years of gaming experience were the group with the highest percentage of phone use for communication while gaming. The data may mean these participants were not beginning gamers and understood the game and controllers well enough to allow use of a third party device for talking. On the other hand, these participants may not have been experienced gamers and used the phone to communicate with more knowledgeable players to talk about game strategy. Adolescents are using communication tools to learn and partially fulfill their social needs.

What Participants Like About Playing Games. Participants play games for many different reasons, but the most common reasons were for meeting new people, for the challenge and successes, and for being immersed in the storyline to escape reality.

A desire for playing online focused on meeting new people and sustaining long distance friendships. Participants felt online gaming was just another environment to

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hang out with their friends but also a way to meet new and interesting people from around the world. Some participants even reported building new online friendships that were stronger than their locally based friendships. This worldwide connection is expanding adolescents' interactions and expanding their social context (Veen and Vrakking, 2006). The expanded social context affects their game experiences and with whom they are communicating.

However, playing games was just not about being with friends; the environment was also conducive to competition for building skills and recognition of successes. Gee has been the lead researcher in identifying adolescents' role as active learners because they are exploring, experimenting, thinking, strategizing, and reflecting (2007). This study found supporting evidence as participants reported their topic of communication was game strategy. In open-ended responses, participants reported they liked learning from other players, watching and experiencing strategies used by other players, and developing social and team-building skills. Playing online gave participants the opportunity to connect with other people to have new gaming experiences because other people play differently and bring a fresh perspective to the game.

Games also provided recognition of successes through leader boards, achievement points, game stats, and gamer cards. Participants liked being in an environment where they were recognized, accepted, and other people "get them." They were able to escape reality by meeting new people and immersing themselves in the storyline of the game.

In summary, the immediate personal and online social context of gaming (building upon Mäyrä's model for Contextual Game Experience, 2007) is expanding

adolescents' social context. Adolescents are using communication tools to connect with friends and meet new people to learn new strategies and build friendships. Online gaming is fulfilling social and learning needs of adolescents. "Interaction is always evolving because game play and experience are never the same because of online gamers" (T. Bailey, personal communication, May 24, 2011) sums up the social context and desires of adolescents playing online games.

Implications

Since this study set out to inform the design of educational games, this section will summarize suggestions. First and foremost, adolescents' social contexts should inform the design of educational games. Gaming is an important aspect in fulfilling their social needs and desires to learn.

Casual Gamers. Identifying participants in the study as casual gamers influences the design of educational games and how games should be implemented to improve learning outcomes. Initial insight suggests a good match between the time students are willing to play games and the time teachers are willing to release for game-based instruction. Educational games should be designed to supplement, not replace, classroom instruction. Less than an hour of game play a day can provide opportunities to learn new information or concepts, supplement content to reinforce or further explore concepts, add content to prepare students for standardized testing or certification exams, or provide time to connect with a community of learners in specific content areas. Adolescents as casual gamers give educators the option to use games for learning within an instructional period or as outside assignments. Educators would likely be more open to the learning

potential of games if they were designed for the casual gamer, thus requiring less time for implementation. As Gros (2003) reported, teachers "stressed difficulty of using simulation games in secondary teaching due to pressure of time and the need to cover the educational program in it's [sic] entirety."

Collaborative Play. To meet the preferences of adolescents, educational games need to provide more than solitary game play experiences and connect adolescents to people of similar interests outside of the classroom and physical educational environment. Educational games need to be accessed via the Internet with little effort and be available any time. Adolescences should be able to connect and start playing online games collaboratively without any delay or complicated set-up. Educational games should provide for collaborative as well as competitive play. Participants in this study liked the challenge and camaraderie of playing as a team, learning new game strategies, and meeting new people. Designers of educational games should consider online collaborative play opportunities and the cooperative storyline in educational games.

Presence of Others. Realizing other people are present and actively playing the game with participants opens up many design possibilities for educational games. One such possibility is to adapt a design idea used for many animated movies of devising content for all ages. Educational games could be designed with content geared for adolescents but also contain content that younger siblings could understand, thus enabling them either to play using a controller or to give game advice. Games may also include various levels that can be played simultaneously by multiple players. *Rockband* by Harmonix implements such a game design where multiple players can play

collaboratively in the same band but on different levels (e.g., beginner, advanced). This design would enable educational games to reach a wider audience and attain greater popularity because adolescents would be able to play collaboratively and involve other people present in the room with them.

Tools for Communication. Eighty-five percent of participants are communicating with other people while playing games, indicating that communication is important to adolescents when playing games. Adolescents are using their phones and in-game tools to communicate while playing. This finding is important because currently many educational institutions do not permit students to use phone during school hours and many educational game designs do not incorporate the use of phones by players. Educational institutions also block ports to prevent in-application communication tools from working.

Recommendations for Further Research

A majority of the participants in this study were identified as casual gamers. This phenomenon may be partially due to the increased use of mobile devices and social Internet applications. Mobile devices enable adolescents to play games on-the-go, while social Internet applications permit adolescents to play games while being social lending: both lead to fewer hours of concentrated game play. More research is needed to identify what it really means to be a casual adolescent gamer. Since these gamers are using online games as way to connect and interact with other people, is gaming more focused on social and learning needs or the game play itself? Why are they casual gamers and how does this activity fit into their immediate personal and online social contexts? Are they

playing to communicate or communicating while they play? Future studies should look at designing educational games to meet the desires and needs of casual gamers.

The presence of others as active gamers and how this can inform the design of educational games should be researched further. Participants in the study stated others present were most often siblings and friends. Research should look at how game design can incorporate these others present in the students' social context to maximize communication and interaction for meeting learning needs. Research should consider game design when the other people present are younger siblings, friends of the same age, or older friends. How can the communication of other active gamers be maximized to make educational games fun while solving complex learning problems?

Further research is recommended to explore engaging storylines and online opportunities for extending experiences beyond students' immediate social context. Research should look at evolving challenges and competition to build students' skills and offer the opportunity to learn new strategies from others. In addition, providing an area for the celebration of successes as a way to highlight students' new skills is worth exploring.

Participants in this study were looking for different play experiences when they played online versus when they played offline. What participants liked about playing games online included the ease and convenience of playing with other people, meeting new people, playing against another human being, escapism, and collaborative play. But, when playing offline, participants liked focusing on their own personal achievement, storyline of the game, solitary play, and playing games with others in person. Because

participants appear to be looking for different play experiences, it is recommended that game designers explore and consider the way online and offline games are played. Many games developed today are designed for offline play and then have an online version created as an add-on or additional feature. Instead, games should be designed specifically for offline play to meet the desires of offline play and another game developed specifically for online play. Further research could help identify the reasons and ways games are played and shape a new design of two very different types of game play – one design for offline and one for online.

Further research is needed on the role of perezhivanie and how an individual experiences a game. Since personal and environmental characteristics seem to be impacting game play, more questions need to be asked concerning the role of cultural influences during game play. Answers to these questions could inform the design of educational games in to enhance game play based on cultural differences.

Finally, this study examined self-reported preferences of adolescents using an online survey, a method that has limitations. More information could be obtained through a combination of tools and methods for collecting data as recommended in previous research (Davis, Steury, & Pagulayan, 2005).

Appendix A

Assent Form

Gaming Social Preferences

1. Reason for Research

* 1. Research Procedures
The reason for this research is to better understand how students talk and interact with people while playing games. If you agree to participate, you will be asked to complete an online survey of 5 – 49 questions. The survey should take you approximately 15 – 20 minutes to complete. Please make sure you have permission from your parents/guardians to take this survey.

Risks
There are no expected risks for participating in this research. While it is understood that no computer transfer of data is 100% safe, reasonable efforts will be made to protect your answers to the survey.

Benefits
There are no benefits to you as a participant other than to advance research in educational gaming.

Confidentiality
Your answers to the survey will be kept private and no information will be collected that would identify who you are.

Participation
To participate in this survey you must be 13 – 18 years old, enrolled in high school, and an online gamer. Your participation is voluntary, and you may stop the study at any time and for any reason. If you decide not to participate or if you stop the study, there is no penalty or loss of benefits to you. There are no costs to you or any other party.

Contact
My name is Jeannette Shaffer and I am studying to get a PhD in Education at George Mason University. I can be reached at 347–766–9787 and my advisor, Priscilla Norton, can be reached at 703–993–2015. You may contact the George Mason University Office of Research Subject Protections at 703–993–4121 if you have any questions or comments regarding your rights as a participant in the research.

This research has been reviewed according to George Mason University procedures for your participation in this research.

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Gaming Social Preferences

Consent

I have read this form and agree to participate in this study. Please print a copy of this page to keep and share with your parents/guardians.

◯ Yes, I agree. Continue the Survey

◯ No, I do not agree. Please, end the survey.

Appendix B

Game Features and Demographics Study (GFDS)

Gaming Social Preferences

1. Reason for Research

*1. Research Procedures

The reason for this research is to better understand how students talk and interact with people while playing games. If you agree to participate, you will be asked to complete an online survey of 5 - 49 questions. The survey should take you approximately 15 – 20 minutes to complete. Please make sure you have permission from your parents/guardians to take this survey.

Risks

There are no expected risks for participating in this research. While it is understood that no computer transfer of data is 100% safe, reasonable efforts will be made to protect your answers to the survey.

Benefits

There are no benefits to you as a participant other than to advance research in educational gaming.

Confidentiality

Your answers to the survey will be kept private and no information will be collected that would identify who you are.

Participation

To participate in this survey you must be 13 - 18 years old, enrolled in high school, and an online gamer. Your participation is voluntary, and you may stop the study at any time and for any reason. If you decide not to participate or if you stop the study, there is no penalty or loss of benefits to you. There are no costs to you or any other party.

Contact

My name is Jeannette Shaffer and I am studying to get a PhD in Education at George Mason University. I can be reached at 347-766-9787 and my advisor, Priscilla Norton, can be reached at 703-993-2015. You may contact the George Mason University Office of Research Subject Protections at 703-993-4121 if you have any questions or comments regarding your rights as a participant in the research.

This research has been reviewed according to George Mason University procedures for your participation in this research.

Gaming Social Preferences

Consent
I have read this form and agree to participate in this study. Please print a copy of this page to keep and share with your parents/guardians.

◯ Yes, I agree. Continue the Survey

◯ No, I do not agree. Please, end the survey.

2. Age

*2. How old are you?

◯ Under 13 years old

◯ 13 - 18 years old

◯ 19 or older

3. Student Status

*3. Are you currently enrolled in school?

◯ No

◯ Yes

4. Gamertag

*4. What is your online gamertag or avatar? (This information is used to verify you are an online gamer.)

[   ]

5. Gender and Race

*5. Are you female or male?

◯ Female

◯ Male

Gaming Social Preferences

*6. What is your race?

◯ African American

◯ Asian

◯ Hispanic

◯ Native American

◯ White

◯ More than one race

◯ Other (please specify)

[   ]

6. Online or Offline

*7. Which do you think is more fun?

◯ Playing games online

◯ Playing games offline

7. Years Playing Online

This section of questions will ask you about playing games online.

*8. How many years have you been playing games online?

◯ Do not play games online

◯ 1-2 years

◯ 3-6 years

◯ 7+ years

8. Time Playing Online

*9. How often do you play games online?

◯ Daily

◯ Weekly

◯ Monthly

9. Online Hours by Day

Gaming Social Preferences

*10. How many hours per day do you play games online?

○ 1-2 hours

○ 3-4 hours

○ 5 or more hours

10. Online Hours by Week

*11. How many hours do you play online per week?

○ 1-7 hours

○ 8-14 hours

○ 15 or more hours

11. Online Hours by Month

*12. How many hours per month do you play games online?

○ 1-10 hours

○ 11-20 hours

○ 21 or more hours

12. Mode of Online Play

*13. Which do you think is more fun?

○ Playing alone

○ Playing against another gamer

○ Playing collaboratively or part as a team

*14. But, how do you play online most of the time?

○ Play alone

○ Play against another gamer

○ Play collaboratively or part as a team

13. Hours of Social Play

Gaming Social Preferences

*15. How many hours per week do you play online against other people?

○ 1-7 hours

○ 8-14 hours

○ 15 or more hours

*16. How many hours per week do you play online collaboratively or as part of a team?

○ 1-7 hours

○ 8-14 hours

○ 15 or more hours

*17. Do you play games online while other people are in the room with you?

○ Yes

○ No

14. People in Room

*18. When playing games online with people in the room, what are the other people doing?

☐ Playing online against or with you

☐ Playing a different game online on their own

☐ Watching you play and giving advice

☐ Watching you play

☐ There and doing something else

*19. When playing games online with other people in the room, who are the people there with you?

☐ Parents or guardian

☐ Brothers or sisters

☐ Extended family members

☐ Friends

☐ Other (please specify)

[   ]

Gaming Social Preferences

*20. How often do you talk with other people while playing?

○ A lot - I talk constantly

○ Occasionally

○ Only to introduce myself

○ Not at all

15. Talking Online

*21. The people I talk to are ... (check all that apply)

☐ In the same room

☐ At a different location

☐ Online

*22. The people I talk to in the same room are ... (check all that apply)

☐ Parents

☐ Brothers or sisters

☐ Extended family

☐ Friends

☐ People I have never met

☐ Other (please specify)

[   ]

*23. The people I talk to that are at a different location are ... (check all that apply)

☐ Parents

☐ Brothers or sisters

☐ Extended family

☐ Friends

☐ People I have never met

☐ Other (please specify)

[   ]

Gaming Social Preferences

*24. The people I talk to online are ... (check all that apply)

- [ ] Parents
- [ ] Brothers or sisters
- [ ] Extended family
- [ ] Friends
- [ ] People I have never met
- [ ] Other (please specify)

  [   ]

*25. I talk mostly about ...

	Most of the time	A little	Not at all	N/A
Getting to know other gamers	○	○	○	○
Game strategy	○	○	○	○
Non-game related	○	○	○	○

16. Talk Tools

*26. I use the phone to talk by... (check all that apply)

- [ ] Talking
- [ ] Texting
- [ ] Video chat
- [ ] Group chat
- [ ] Don't use
- [ ] Other (please specify)

  [   ]

Gaming Social Preferences

*27. I use in-game chat tools ...

☐ Text

☐ Audio chat

☐ Video chat

☐ Messages (text, voice, or video)

☐ Don't use

☐ Other (please specify)

[   ]

*28. The other chat tools I use include: (list the tools you use)

◯ Don't use

◯ Other tools (please list)

[   ]

29. What is the cool thing you like about online gaming?

[   ]

17. Play Offline

Now, this survey will switch gears and will ask about playing games offline. Please remember as you complete the rest of the questions in this survey, the questions about offline play (not online).

*30. How many years have you been playing games offline?

◯ Do not play games offline

◯ 1-2 years

◯ 3-6 years

◯ 7+ years

18. Time Playing Offline

Gaming Social Preferences

*31. How often do you play games offline?

◯ Daily

◯ Weekly

◯ Monthly

19. Offline Hours by Day

*32. How many hours per day do you play games offline?

◯ 1-2 hours

◯ 3-4 hours

◯ 5 or more hours

20. Offline Hours by Week

*33. How many hours do you play offline per week?

◯ 1-7 hours

◯ 8-14 hours

◯ 15 or more hours

21. Mode of Offline Play

*34. How many hours per month do you play games offline?

◯ 1-10 hours

◯ 11-20 hours

◯ 21 or more hours

*35. Which do you think is more fun?

◯ Playing alone

◯ Playing against another gamer

◯ Playing collaboratively or part as a team

Gaming Social Preferences

*36. But, how do you play offline most of the time? (check all that apply)

☐ Play alone

☐ Play against another gamer

☐ Play collaboratively or part as a team

*37. Do you play games offline while other people are in the room with you?

◯ Yes

◯ No

22. People in Room - Offline

*38. When playing games offline with people in the room, what are the other people doing?

☐ Playing against or with you

☐ Playing a different game on their own

☐ Watching you play and giving advice

☐ Watching you play

☐ There and doing something else

*39. When playing games offline with other people in the room, who are the people there with you?

☐ Parents or guardian

☐ Brothers or sisters

☐ Extended family members

☐ Friends

☐ Other (please specify)

[   ]

*40. How often do you talk with other people while playing games offline?

◯ A lot - I talk constantly

◯ Occasionally

◯ Only to introduce myself

◯ Not at all

23. Talk To Offline

*41. The people I talk to are ... (check all that apply)

☐ In the same room

☐ At a different location

☐ Online

*42. The people I talk to in the same room are ... (check all that apply)

☐ Parents

☐ Brothers or sisters

☐ Extended family

☐ Friends

☐ People I have never met

☐ Other (please specify)

[   ]

*43. The people I talk to that are at a different location are ... (check all that apply)

☐ Parents

☐ Brothers or sisters

☐ Extended family

☐ Friends

☐ People I have never met

☐ Other (please specify)

[   ]

Gaming Social Preferences

*44. The people I talk to offline are ... (check all that apply)

- [ ] Parents
- [ ] Brothers or sisters
- [ ] Extended family
- [ ] Friends
- [ ] People I have never met
- [ ] Other (please specify)

[   ]

*45. I talk mostly about ...

	Most of the time	A little	Not at all	N/A
Getting to know other gamers	○	○	○	○
Game strategy	○	○	○	○
Non-game related	○	○	○	○

24. Talk Tools Offline

*46. I use the phone to talk by... (check all that apply)

- [ ] Talking
- [ ] Texting
- [ ] Video chat
- [ ] Group chat
- [ ] Don't use
- [ ] Other (please specify)

[   ]

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Gaming Social Preferences

*44. The people I talk to offline are ... (check all that apply)

☐ Parents

☐ Brothers or sisters

☐ Extended family

☐ Friends

☐ People I have never met

☐ Other (please specify)

[   ]

*45. I talk mostly about ...

	Most of the time	A little	Not at all	N/A
Getting to know other gamers	○	○	○	○
Game strategy	○	○	○	○
Non-game related	○	○	○	○

24. Talk Tools Offline

*46. I use the phone to talk by... (check all that apply)

☐ Talking

☐ Texting

☐ Video chat

☐ Group chat

☐ Don't use

☐ Other (please specify)

[   ]

Gaming Social Preferences

*47. I use in-game chat tools ...

- ☐ Text
- ☐ Audio chat
- ☐ Video chat
- ☐ Messages (text, voice, or video)
- ☐ Don't use
- ☐ Other (please specify)

[ ]

*48. The other chat tools I use include: (list the tools you use)

- ◯ Don't use
- ◯ Other tools (please list)

[ ]

49. What is the cool thing you like about offline gaming?

[ ]

25. Thank You

50. Thank you for completing the survey. Click Done to exit the survey.

- ◯ Done

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Curriculum Vitae

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