

Spring 1-1-2015

Gamifying Education for Millennials: It's More Than Just a Video Game

John Francis Mazzo

University of Colorado at Boulder, joma5104@colorado.edu

Follow this and additional works at: http://scholar.colorado.edu/jour_gradetds

 Part of the [Educational Methods Commons](#), [Mass Communication Commons](#), and the [Psychology Commons](#)

Recommended Citation

Mazzo, John Francis, "Gamifying Education for Millennials: It's More Than Just a Video Game" (2015). *Journalism & Mass Communication Graduate Theses & Dissertations*. 28.
http://scholar.colorado.edu/jour_gradetds/28

This Thesis is brought to you for free and open access by Journalism & Mass Communication Program at CU Scholar. It has been accepted for inclusion in Journalism & Mass Communication Graduate Theses & Dissertations by an authorized administrator of CU Scholar. For more information, please contact cuscholaradmin@colorado.edu.

GAMIFYING EDUCATION FOR MILLENNIALS: IT'S MORE THAN JUST A VIDEO GAME

by

JOHN FRANCIS MAZZO

B.A. Communications, Quinnipiac University, 2010

B.A. Psychology, Quinnipiac University, 2010

A thesis submitted to the
Faculty of the Graduate School of the
University of Colorado in partial fulfillment
of the requirement for the degree of
Master of Arts in Mass Communications Research
School of Journalism and Mass Communications
2015

This thesis entitled:
Gamifying Education for Millennials: It's More Than Just a Video Game
written by John Francis Mazzo
has been approved for the School of Journalism and Mass Communications

Paul S. Voakes, Committee Chair

Shu-Ling Chen Berggreen, Committee Member

The final copy of this thesis has been examined by the signatories, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the above mentioned discipline

Mazzo, John Francis (M.A., School of Journalism and Mass Communication)

Gamifying Education for Millennials: It's More Than Just a Video Game

Thesis directed by Professor Paul S. Voakes

Abstract

This study examines the appeal and success of digital gaming. It notes the past and present studies emphasizing the negative aspects of digital gaming; however, it counters those arguments with findings of research supporting the positive outcomes enjoyed by many gamers, as well as the benefits of harnessing its engaging components, one of which being a heightened flow state. Secondly, it explores the more recent gamification trend by understanding the successful gaming components utilized by this application and how they may be applied to engage a large user-audience, eventually highlighting the need to incorporate gamification into online, mobile platforms geared towards Millennials. It is suggested by the literature that gamification may serve to benefit Millennial learners. Future research is proposed to measure the Millennial learners' preferences for gamified education in higher learning and the efficacy for academic success of such educational applications.

Table of Contents

Introduction	1
Digital Gaming: A History of Success, Criticism, and Positive Outcomes	2
An Overemphasis on Addictions: Gamers Are Engaged	4
Mitigating the Negative Digital Gaming Concepts and Enhancing the Positive Ones	8
Flow Experience in Digital Gaming	13
Gamification: The Application of Potentially Beneficial Gaming Mechanics	20
The Birth of a Game	21
The Components of Success: Mechanics and Designs	25
Interactivity: What can I do?	25
Achievements and “leveling up” feel good.	26
I have a date with my game.	27
Progress: How much further do I need to go?	29
Let’s play together.	29
How Gamification Is Used Today	31
Millennials and the Gamification of Education	33
Millennial Preferences and Expectations	34
Gamifying Education for Millennials: It’s Worth the Investment	37
Potential Benefits of Gamifying Education	43
<i>Duolingo: A Successful Educational Gaming Application</i>	43
Future Research	45
Conclusion	47
References	49

Gamifying Education for Millennials: It's More Than Just a Video Game

Currently, there is growing research supporting the positive outcomes of digital gaming, highlighting the engaging components found in the design, as well as, the positive experiences reported by gamers. Gaming research has noted numerous positive gaming concepts, which tend to fall under one of three categories: immersion, achievement, and social interaction. Understanding the potential for positive gaming experiences and the engaging factors of digital gaming, a new trend of gamification has arisen taking advantage of the positive gaming research and applying the knowledge to realms outside of the gaming world to influence and promote engagement, participation, and retention (Meloni, & Wolfgang, 2012).

Educational gaming is an already established industry serving an ever-growing market. It is the object of this study to support the positive gaming perspective by demonstrating the potentially beneficial application of successful gaming mechanics and design in an educational platform built for adults and higher learning. Considering the extreme popularity of mobile apps, the saturation of mobile devices in the classroom and at home, and the potentially successful gamification tactics utilized across business markets, this form of education may prove to be highly popular among Millennial learners. This application may prove to engage students at higher a degree, promote active participation, influence learner retention, and benefit learners academically (Marston, 2013)(Shen, Callaghan, & Shen, 2008).

The current study predicts that primarily Millennials will benefit academically from gamified educational applications due to its capacity for inspiring higher learner flow states. It also predicts that Millennials' preference for gamified education is greater than that of traditional learning formats. The current research suggests that although Millennials are open to gamified educational applications, it does not necessarily mean that they will benefit from incorporating an educational game. A more abstract application of gamification to the entire course curriculum will benefit Millennial students even more.

The literature analysis will support these assertions by first examining the success of entertainment gaming, which will also incorporate a discussion of flow theory and its strong relationship with gaming. Next, the study will highlight the growing trend of gamification and touch on the successful gaming components that may be applied in other areas, such as education. Finally, it will examine the Millennial generation, their distinctions, and their preferences as a digitally savvy, socially connected population.

Digital Gaming: A History of Success, Criticism, and Positive Outcomes

Since the release of the *Atari 2600*, in 1977, video gaming has found its place in the home living room, established as an entertainment center created for the family. The *Nintendo Entertainment System (NES)* would soon follow (Braff & Snead, 2014). Released in Japan in 1983, and later in 1985 in the United States, the NES would prompt an explosion in popularity of a newer media industry that would establish itself as one of the largest today. It is known as the digital gaming industry. In fact, this industry is currently larger than the music and film industries combined with an average worth of \$50 billion (Meloni & Wolfgang, 2012). Those born and raised in the late 1970s, early '80s, would witness the growth and collapse of numerous gaming companies and consoles, the creation of new gaming genres, and the ever-evolving platforms with which to play those games. Today, it is apparent that the video game industry draws a global audience of various backgrounds and age groups. No longer is digital gaming associated with children or adolescent players only. Currently, the average age of the gamer falls somewhere between the late 20s and early 30s (Bavelier, 2012). *Statista* (2015a) reported that in 2014, 39% of gamers were 36 years of age or older, 32% were between ages 18 to 35, and 29% were ages 18 and younger. That means that the average gamer is no longer a child or adolescent. The digital gaming children of the late 70's and early 80's have grown with this industry. They continue to play and benefit from this enjoyable activity.

The success of digital games is also quite astonishing. For example, one of the more popular first-person shooter titles in gaming, *Call of Duty: Modern Warfare 3*, which launched in November 2011, grossed more than \$1 billion in its first 16 days of sales. The most successful film of that same year, *Harry Potter and the Deathly Hallows Part 2*, grossed only a third in comparison (Meloni & Wolfgang, 2012). Bavelier (2012) highlights the level of engagement of another title in the *Call of Duty* series, *Black Ops*. This particular title was played for over 600 million hours cumulatively by gamers around the world. This is not the first digital game to experience such a massive user-audience. For example, *World of Warcraft* is one of the most successful massively multiplayer online role-playing games (MMORPGs) of all time. It recently celebrated its 10-year anniversary in November of 2014 and still boasts a user-audience in the tens of millions (Blizzard Entertainment, Inc., 2015).

It may surprise many to know that the range of gamers is far greater than previously assumed. The top five gaming apps found on social media sites like Facebook, have a much broader audience including men, women, boys, and girls of all ages, contradicting an age old notion that video gamers are primarily male teenagers. These 'social/mobile' app games see more than 430 million active users a month worldwide (Meloni & Wolfgang, 2012).

The first app store of its kind, the *Apple App Store*, launched in July 2008 with around 500 apps available for download (Statista, 2015e; 2015g; 2015h). In the summer of 2014, over 75 billion apps had been downloaded from the *Apple App Store* since its launch. Currently, the two top mobile application stores worldwide are the *Apple App Store* and *Google Play*. In 2012, these two companies owned 82% of the worldwide market share of mobile app downloads. In 2015, digital games were the most popular apps available in the *Apple App Store*, comprising 21.45% of all apps available for download. Educational apps came in third at 9.95%. In February 2014, 92% of all gaming app revenue came from 'freemium' apps, free apps with in-game purchasing available.

Digital games are enjoyed on various newer mobile technologies, such as smartphones, tablet computers, and other mobile devices. They are downloaded as mobile applications, or apps, that can also be accessed through social media websites, like *Facebook*. No longer are digital games enjoyed solely on the PC, gaming console, or at the nearest arcade. In fact, the mobile market is currently earning the highest revenue above all other platforms for gaming. In the United States, specifically in 2014, the mobile platform earned 35% of all the revenue generated for digital gaming. That same year, PCs earned only 22%, while gaming consoles earned a measly 8%. The remaining market revenue was split by online venues, such as social networking sites like *facebook* at 17%, free-to-play (F2P) MMORPGs at 12%, and pay-to-play (P2P) MMORPGs at 6% (Statista, 2015c).

It is no mystery that gaming is an ever-growing, ever-changing, ever-popular industry that has proved its success and sustainability. At the same time, this activity has been highly scrutinized in the academic realm, as well as by many concerned parents. Notions of the potential harmful effects of prolonged video game use, especially on youth, as well as concerns of possible addictive behaviors displayed by passionate gamers, have fueled a discourse of negativity. There exists, however, a counterargument that suggests digital gaming behaviors to be influenced by beneficial, engaging gaming components resulting in an overall positive experience.

An Overemphasis on Addictions: Gamers Are Engaged

Video games have received their fair share of criticism by the news media, scholarly critics, and concerned parents. As in most cases with emerging forms of new media, a portion of the population is opposed to its increased popularity. Similar instances of negative backlash occurred with the creation and increased popularity of radio and television (DeFleur & Lowery, 1995). The recurring historical trend is characterized by an inevitable outcry against any new form of media. These concerns are fueled by fears of the unknown effects of the media on the masses, no matter their age, sex, or other demographic backgrounds. The same holds true for digital gaming. This

activity became very popular among families, especially among younger generations. Perhaps people began to notice the amount of time their children spent playing these games. Eventually, scholars studied these trends, and some have deemed these behaviors to be, in certain cases, addictive ones and potentially harmful.

The goal of this analysis is to not ignore those past studies focused on the negative aspects and potentially harmful effects of digital gaming. However, it is somewhat familiar to see a younger, popular form of media draw tremendous scrutiny from concerned scholars, health experts, and parents for its potential for inducing negative behavioral outcomes. There are numerous examples of research covering digital game play, examining the notions surrounding the dangers of its prolonged use on development, the characteristics and prevalence of video game addiction, and the negative effects of violent video game play on people's behavior (Chory & Banfield, 2009; King, Delfabbro, & Griffiths, 2010; Lemmens, Valkenburg, & Peter, 2009).

When discussing the research surrounding the effects of video games on players, whether it be long term versus short term play, positive or negative influences on affect and behavior, or its role in hindering or facilitating strong interpersonal relationships, it is obvious that there are two general perspectives fueling this discourse: The negative perspective versus the positive view of digital gaming.

One major argument of discussion highlights the clashing notions of video game addiction versus video game engagement. To begin, video game addiction is a popular topic of study in the negative perspective of digital gaming. In 2009, Lemmens, Valkenburg, and Peter developed and validated a Video Game Addiction (VGA) Scale, which was adapted from the pathological gambling scale found in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), a method shared by multiple studies interested in video game addiction (King, Delfabbro, & Griffiths, 2010). This scale is composed of seven criteria associated with addiction disorder in digital gamers: saliency of play, tolerance development, mood modification (euphoria or relaxed feelings due to

escapism), withdrawal symptoms with decreased play, relapse, interpersonal conflicts, and displacement and intrapsychic problems. These studies and notions are fueled by the rare reports of binge gamers, from countries like South Korea and Taiwan, who died from their exhaustive and relentless game play (Cameron, 2007)(Hunt & Ng, 2015).

There may be support for the notion of video game addiction, but psychologists have yet to formally classify this as a psychiatric disorder in the United States (Kirsh, 2010). Gaming addiction, and other forms of media addiction for that matter, was omitted in the latest edition of the famed Diagnostic and Statistical Manual of the American Psychiatric Association (2013). Currently, the only accepted form of non-substance-related disorder is gambling. Petry (2013) asserts her support for this omission as she comments on the nationally representative study of gaming addiction in Germany, completed by Festl, Scharnow, & Quandt (2012). Their findings suggest that there is a negligible percentage of German gamers who are actually addicted. Festl et al. (2012) estimate that about 25% of Germany's population play digital games, at least occasionally. Of that 25%, only 3.7% reported four out of the seven predictors for video game addiction. In other words, it is suggested that the population of "addicted" gamers is less than 0.05%. Petry strongly agrees with the conclusions of Festl et al., which suggest that video games may be very popular, but they do not appear to lead to a genuine problem in the vast majority of gamers in western societies. There is an increased need for reliable, longitudinal research to better assess the societal risk of digital gaming.

Previous research may have found success with the VGA Scale; however, there still exists numerous skeptics with respect to the results of the scale, as well as, the notions and concerns surrounding video game addiction research. Certain constructs related to saliency of gameplay, such as "Time Spent on Games," may be overemphasized in the negative perspective of digital gaming. In fact, King, Delfabbro, and Griffiths (2010) are especially concerned with the relationship with the video game addiction scale and this specific construct. They argue that the degree of "Time

Spent on Games” is not defined properly, and that there is no true distinction between a healthy, passionate interest versus an unhealthy addiction. They posit that this ambiguous construct may be distracting researchers from the truth behind gamers’ habits, addictive or not. They concluded that the former studies labeling certain participants as dependent on technology and digital gaming, could have also described these individuals as passionate, engaged video game enthusiasts. It is possible for gamers to enjoy digital media in responsible and constructive ways; numerous studies support this notion (King, Delfabbro, & Griffiths, 2010; Clark, 2011; Frau-Meigs & Meigs, 2009).

Another negative outcome of concern is the effect of long-term video game play on the gamers’ abilities to establish and maintain meaningful, interpersonal relationships. Chory and Banfield’s (2009) findings suggested that increased levels of media dependency lead to lower levels of relational maintenance. That is, those participants most dependent on media technology have a harder time maintaining strong relationships with family, friends, or romantic partners.

This notion is contested by the existence and popularity of multiplayer gameplay. The majority of digital gaming takes place on one of three platforms (Statista, 2015c): the mobile platform (including smartphones, tablet computers, and other mobile devices), PCs, and gaming consoles (such as *Sony’s PS4*, *Microsoft’s XBOX 1*, or *Nintendo’s Wii U*). All three of these devices are capable of an online connection and the majority of digital games provide some form of online or multiplayer experience. Video games are providing a digital space for fun, and potentially meaningful, social interaction. Of course, this is no way to communicate with everyone, but for those who enjoy gaming, these platforms allow for long distance relationships to be maintained and strengthened. One can stay connected with friends and family via online multiplayer games. New relationships can also flourish in these digital realms. These new “gaming” relationships may strengthen over time, possibly developing into relationships outside of the virtual world.

Similar to social networking sites, digital gaming allows for individuals to maintain long-distance and close relationships, interdependent or codependent, as well as promote new ones; De

Shutter and Vanden Abeele (2010) identified eight motivations of older generations to participate in digital gaming. These motivations, as reported by participants, include using digital gaming as a tool for socializing, way of finding relevance with younger generations, mechanism for combating loneliness, activity to relax with colleagues, means for staying connected with family members, instrument to learn with and teach younger generations (especially, family), playful competition with others (including family and friends), and an application for overcoming challenges with children and/or grandchildren. This research strongly suggests that people also perceive this activity as method for building and maintaining strong, meaningful relationships. It provides a digital venue for social interaction and a means to stay connected with others.

It is understood that gaming is not necessarily addictive. Although the research supporting those notions is rich, it is possible that there is an overemphasis on gaming addiction. This leads other researchers to suggest that gamers are actually engaged and that the majority of gaming experiences are positive ones. So, what are those positive concepts?

Mitigating the Negative Digital Gaming Concepts and Enhancing the Positive Ones

There may be substantial research studying addictive behaviors influenced by digital gaming, but it is also apparent that there are a growing number of scholarly articles focused on the engaging components of digital gaming, as well (De Schutter & Vanden Abeele, 2010; Jin, 2012; Kaye & Bryce, 2014; Kneer, Glock, Beskes, & Bente, 2012; King, Delfabbro, & Griffiths, 2010; Lee & LaRose, 2007). Historically, academic research viewed the effects of video games on audiences, or users, as primarily negative (Kneer, Glock, Beskes, & Bente, 2012). For example, those studying the effects of violent video games on player aggression, the antisocial behaviors of video gaming enthusiasts, or the emotional instability influenced by gaming may argue that digital gaming plays a major role in negative behavioral outcomes.

Similarly, other research conducted in the past focused on the potentially negative effects of television on the masses. The United States experienced a tremendous increase in the saturation of

television sets during the 1950s. At least one television set could be found in 88 percent of US households by the end of the decade (DeFleur & Lowery, 1995). As this technology became increasingly popular among viewers, there emerged a population of scholars and parents questioning the potentially harmful effects of prolonged television exposure. In response to this concern, academia focused on the overall negative outcomes, especially with respect to the effects of violent and sexual programs on child viewers. The overall findings of this argument suggests that television is not particularly harmful for the majority of viewers, nor is it beneficial. There were other environmental factors affecting these children, which related with the strength and support of family and friends, level of parenting, the presence and guidance of parental figures, level of education, and other demographic factors.

There are numerous parallels found with the more current research examining video games and gamers. One of the primary distinctions between television and digital gaming is the degree of participation. There is a difference between passively viewing televised content versus the active participation involved when playing a game. This is even more concerning for scholars and parents alike, as the influence of media is not limited to what is viewed, or observed, but what is done, due to the level of control and the range of possibilities that exist in a virtual setting. If one is susceptible to making poor life decisions based on the media they view, then it is assumed that the media must be even more influential when the participant plays an active role.

One of the biggest titles in digital gaming scrutinized for its outrageously violent and inappropriately sexual content is *Grand Theft Auto (GTA)*. The most recent addition to this ever popular series is *GTA V*, which received a wave of negative publicity upon its release in September 2013 due to its dark narrative and its associations with committing crimes for fun (Sydell, 2013). Shunning this game for these specific reasons ignores its advancements in design, the heightened level of interactivity (an important gaming component), the aesthetic beauty of the digital environment, and the overall satirical theme of the game. *GTA* is similar in tone to other anti-hero

narratives, such as the films, *Scarface* (1983) and *The Godfather* (1972), or the critically acclaimed television series *Breaking Bad*.

It is possible for parents to protect their children from the violent and sexually explicit content found in many digital games today. There is a wide range of gaming genres, all with varying content, suggested age appropriateness, and levels of interactivity, as rated by the *Entertainment Software Rating Board (ESRB)*. Just as in film and television, the content of digital gaming is rated by a trusted organization. Becker-Olsen and Norberg (2010) found that most gamers, of all ages, agree that the younger generations need some form of parental mediation. They also noted that all participants, regardless of age, commonly reported that their age group did not need parental supervision, but younger groups might.

An additional issue discussed by these researchers highlights the lack of understanding about the various ratings set by the *ESRB* among many parents. It is suggested that perceived intensity of violence outweighs perceived frequency of violence when deciding if a game is appropriate or not. There also seems to be some confusion behind the descriptor 'Animated Violence,' as many parents believe this relates to cartoon-like violence, and has little influence on the parents decision. If parents are concerned about the games their children are playing, it is important for them to actively learn about them. A potentially effective form of parental mediation includes participatory learning (Clark, 2011). This is an active form of mediation, which includes a healthy and necessary interaction between the parent and the child. It provides an opportunity for collective learning about responsible and appropriate media consumption in the household. Boundaries are more fairly set by parents and better understood by the child.

Still, violent video games continue to exist, and gamers continue to play them. When considering the effects of violent video games on gamers, Weaver and Lewis (2012) explored the distinct role of the gamer as an active participant with the media, or as they described it, a moral actor (Boyer, 2013). Weaver and Lewis' study (2012) examined how players make moral decisions

while gaming and how these decisions affect their emotional responses to the game. It is suggested that previous studies of the same focus emphasized the assumed default cognitive bias of the majority of gamers, which is to humanize the characters and their avatars in the game. By doing this, gamers applied morality and empathy in their decision making process during their interaction with the digital entities. This tendency of gamers is argued to be influenced by the immersive qualities enhanced by the fantasy and wonder of the gaming narratives, along with the gamer's level of control determined by the game design.

Researchers found that most gamers eliminate their typical moral judgements during game play to increase their level of enjoyment; this is called moral disengagement (Weaver & Lewis, 2012). Certain participants suspended their disbelief and, to a certain degree, interacted with the game as they would in real world situations. This study found that only 4 percent of its participants engaged in unprovoked aggression. In situations where players were provoked, 52 percent of players still chose to not engage in aggressive behavior. Even in games like *GTA V*, one can choose to play more honorably as the narrative allows for the gamer to make choices, changing the course of the game depending on which moral route they follow. Of course, it is still a game. It provides a digital setting to act in ways that would not normally be permitted or even possible in reality. Where films and television can only inspire the imagination, digital gaming allows for people to act out those imaginations in a safe, virtual setting. However, adverse behavioral outcomes are not the only influence of digital games. Becker-Olsen and Norberg (2010) suggest that not all gamers act aggressively after prolonged violent digital gameplay; it is possible that the gamer becomes desensitized to the video game violence.

So, why is digital gaming so popular? What is it that draws players in and retains long-term, engaged gamers? It is apparent that Millennials not only grew up with video games but also with the negative rhetoric surrounding digital gaming and its unfavorable effects on players' behaviors, social intelligence, and physical, mental, and emotional well-being. For this generation, digital

gaming is a perceived normal activity, whether they play themselves or know somebody else who does. For this reason, Kneer, Glock, Beskes, and Bente (2012) assume that the majority of people of the digital age may defend video gaming, or at least defend those people, such as family, friends, or acquaintances, who do play.

Their study focused on the activation of specific game-related concepts in players and non-players when faced with various gaming content. Prior research supports the notion that semantic concepts and cognitive links (the relationships and associations between two concepts) are subjective and will differ from person to person, as well as differ for an individual depending on various experiences (Kneer, Glock, Beskes, & Bente, 2012). They argue that positive concepts exist with respect to digital gaming, especially among avid gamers. These people tend to associate gaming with relaxation and achievement, rather than with aggression. There are three motivational reasons for playing MMORPGs, like *World of Warcraft*, as suggested by Yee (2006). These are achievement (as related with competition, avatar advancement, and increased player skill level), social interaction (which includes socializing, teamwork, and group acceptance), and immersion (a level of engagement associated with relaxation due to escapism) (Yee, 2006; Voss, 2013).

Kneer, Glock, Beskes, and Bente (2012) conducted a 2x2x6 study to examine this notion. This included the comparison with experienced players and non-experienced players, the priming of nonviolent and violent gaming images, and the positive, negative, and neutral concepts associated with video games, which include social interaction, immersion, achievement, aggression, emotional instability, and neutral words. Primed by the various images of violent and nonviolent video games, participants were then asked to select the degree of relation of these concepts with respect to the image via a 7-point Likert Scale. Their findings suggested that both players and non-players were defensive of gaming, even when primed with a violent gaming image and presented with a negative gaming concept. The researchers found that the activation of positive concepts

related to gaming, such as social interaction, immersion, and achievement, helped to suppress the negative ones. In fact, social interaction, a positive gaming concept nullifying the antisocial associations with avid digital gamers, was the most heavily activated concept of all.

The study discovered an interesting dilemma with respect to one of the positive concepts, immersion. It is possible that immersion may be either positive or negative depending on the context. For example, the state of relaxation, as related to immersion, is obviously a positive aspect of this concept. Escapism, on the other hand, may be interpreted as either negative or positive. Escaping the stresses of everyday life is normal, so as long as the individual is eventually able to address and cope with those issues. If gaming is used as a crutch, or tool, to consistently avoid the challenges and responsibilities of life, then there is a behavioral issue. To a certain extent, the responsibility falls on the individual and their loved ones to address any poor behaviors and correct them. As previously discussed, there is not enough evidence to suggest that video game addiction is prevalent in western societies. In fact, current research is suggesting the opposite. Engagement is the new focus in digital gaming and it relates strongly with the positive concept of immersion. The degree of long term gamer engagement may be due to the level of immersion experienced during gameplay.

In psychology, there is a theory that attempts to explain this mainly positive, immersive state. It is the theory of flow as manifested by Csikszentmihalyi (2000), who tackled the notion of a flow state and inspired much research surrounding this phenomenon, especially with respect to digital gaming today.

Flow Experience in Digital Gaming

A flow state is a subjective, intrinsically-motivated experience, related with positive emotional outcomes, heightened focus, and active participation (Csikszentmihalyi, 2000). Elements that form the experience of flow include a balance between challenge and skill, heightened action awareness, clear goals, unambiguous feedback, intense concentration on the task at hand, loss of

self-consciousness, transformation of times, sense of control, and an autotelic activity. It is a state of being, experienced by many during any activity they enjoy and find challenging, yet not overwhelming. It is experienced by aggressive skiers, as they tackle a daring drop off into a chute of moguls and glades marked by the double-black diamond (the highest difficulty marked on a mountain resort). It is also experienced by a moderate skier, as they cruise the smooth, groomed blues (the moderate difficulty level) carving effortlessly back and forth as they glide down the slope. A flow state can be experienced by one lost in the captivating story of a well-written novel, or by others as they sit on the edge of their seats in a dark, crowded movie theatre, focused on the big screen that overwhelms their senses and inspires their imagination. It can be experienced by runners, yoga enthusiasts, painters, musicians, soldiers, mixed martial artists, pilots, race car drivers, and even digital gamers. Anyone can experience a flow state doing almost anything that involves a certain degree of play, creativity, or spirituality. Flow states are felt in the present; they negate the concerns and obsessions of the past and future. All that matters in this state of mind is what is being done right now. It is a fleeting moment, as it only lasts as long as the task. Although it is short lived, it has a profound effect on the individuals happiness, relating strongly with higher levels of subjective well-being in the short term, and, depending on the activity or task, higher levels of long term subjective well-being, as well.

As discussed earlier, there is a distinction between the experience of playing a video game and simply watching television. This is again true when considering the flow state experienced by those enjoying these various types of media technology. People are at a greater likelihood of experiencing flow while playing video games (Chory & Banfield, 2009; Lee & LaRose, 2007; Jin, 2012). To reiterate, a flow state is an autotelic experience characterized by enjoyment, heightened focus, and active involvement. Although it is possible to lose oneself in the beautiful aesthetics, moving soundtrack, and dramatic narrative of a captivating film or award-winning television series, an engaging digital game will more than likely induce a stronger flow experience. This is due to the

level of interactivity mixed in with the game's narrative. Television and film does not possess this interactive capability. Jin (2012) found that digital games with complex narratives and higher levels of interactivity related stronger with the intrinsically motivated flow state. Simpler game designs with limited gamer ability and freedom, elicited weaker flow experiences among participants.

The ability to interact with the media allows for the participants to challenge themselves and engage the game. This form of engagement cannot be replicated by other forms of viewer-only media, such as, radio or television. The game presents the gamer with a set of goals that must be completed in a specific environment, by a certain set of rules, and with a certain degree of control over their characters, avatars. The players immediately become a part of the game's narrative. They must learn the map of the game. In certain cases, this is an extremely important step in becoming a skilled gamer. They must learn the controls of the game and master them. As for storyline, some games allow for the gamer to decide the outcome of the game, based on their choices during critical plot points.

Immersing oneself in a digital game seems to be an easy task as there is always room for growth and improvement. One strong correlation for a heightened flow state, is found between the relationship of perceived skill level and perceived difficulty level of the task. There are numerous studies examining this relationship's effect on participant flow state. Jin (2012) explores this topic with respect to digital gameplay. The study focuses on the flow experience during digital gaming in relation to the balance between perceived challenge of the game and perceived skill of the gamer. A higher degree of flow was reported by players who experienced a level of play that matched their ability. Expert gamers who were observed playing the game at its highest difficulty level reported a higher degree of flow experience. These same gamers would not experience a similar flow state while playing at the beginner level. The flow experience was lost because the game became too easy, and the boredom distracted the players from achieving the desired psychological state.

Similarly, beginner players attempting to play the game at its highest difficulty level failed to achieve a heightened state of flow. In this case, the task was too difficult, and player enjoyment was replaced with frustration. It is important for these two components to complement one another. Once a balance is achieved, the gaming experience becomes more enjoyable. There is a sufficient degree of challenge needed to keep the game interesting and rewarding; however, the game must not be too difficult, ensuring that the gamer succeed at least part of the time. This requires a higher level of focus and active participation from the gamer, rewarding them with a greater likelihood of an achieved flow state.

The design of many video games allows for the gamer to either adjust the difficulty level of the game or adjust the game to specifically match the level of the gamer's avatar. For example, in some first-person shooters like *Halo* or *Call of Duty*, or sports games like *Madden* or *Fifa*, the gamer is able to select the difficulty level before starting the game. This allows for gamers of all levels to enjoy playing at their specific skill level. Even a beginner player is able to succeed at playing a new game by selecting the easiest difficulty level of that game. From there, they can work to increase their ability by striving to play at a higher difficulty. Many game designs have built-in incentives influencing the player to advance difficulty levels by honing their skills in the game.

In the online multiplayer version of games like *Halo*, or *Call of Duty*, the gamer's skill level is measured and matched with other players to create the fairest gaming experience possible, while maintaining a competitive environment. Gamers earn experience during their gameplay online. As they play more and more, the system rates and updates their player level by their kill/death ratio and their number of wins, as well as, many other factors. From this point, the game is able to create a fair match by inviting players that fall in a range of skill levels that keep the game competitive. In Massive Multiplayer Online Role Playing Games (MMORPGs), like *World of Warcraft*, the gamer shares the same world with a mass of other players, all at various experience and skill levels. These

gamers are able to select specific missions, or quests, that match their experience level. They are also able to pass the more difficult ones until they are ready to complete them.

Lee and LaRose's (2007) findings also supported the notion of achieved higher flow states via the balance between participant skill level and task difficulty level. Even though a degree of basic techniques and skills are required to play, the varying difficulty levels allow for many gamers to lose themselves playing. The potential, and incentives, to gain experience and increase skill level keeps gamers engaged, encouraging longer gameplay. Building on this knowledge, two additional predictors of flow were discovered by Jin's (2012) findings. Those who reported higher levels of feelings of competence, as well as those who experienced a successful performance during gameplay experienced higher flow state during play. These predictors fall under the positive gaming concept of achievement. Again, this elaborates on the positive outcomes enjoyed by those who achieve flow. It also supports the idea that flow is an intrinsically motivated experience, which is why gamers may find themselves dedicated to this activity.

In an attempt to clarify the styles of gameplay that elicit higher positive, immersive experiences Kaye and Bryce (2012) examined the differences in self-reported flow between various gameplay contexts. These comparisons included solo (single player campaign or story mode) versus social (online or offline multiplayer mode) gaming modes. In addition, researchers observed distinctions between online and offline gaming, as well as, the differences between two general game types, competitive versus cooperative gameplay, all with respect to achieved flow experience. Researchers conducted a mixed design study. A within-participants model compared flow and mood variables between solo and social gaming experiences. Two between-participants models were also utilized in this study. One compared various levels of flow experienced in solo and social gaming environments, and their effects on post-gameplay mood outcomes (positive or negative). The second examined flow and post-game mood outcomes between online and offline gaming, in either a cooperative and competitive gaming format.

To measure levels of flow state the study incorporated the reliable and frequently used Flow State Scale (Stavrou, Jackson, Zervas, & Karteroliotis, 2007). To measure mood state, the researchers adapted the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). The results of the study suggested that higher flow state levels correlate strongly with a higher positive mood outcome; those who experienced lower flow state levels did not experience the same affective benefits. These findings corresponded with both solo and social gameplay. The results also suggested that group play is more beneficial for affective outcomes than solo game play. This contradicts previous notions that the presence of others may hinder the experience of a flow state. In fact, high levels of flow state were reported during competitive and cooperative games alike, even when non-gaming participants were present. The degree of engagement, or level of flow, correlates strongly with the capacity for social gameplay.

A common flaw in the research observing participant flow state during digital gameplay, is the limited age range in the participants. Marston (2013) notes this limitation in a study that attempts to uncover this same relationship among an older population, including those who do not belong to the "Internet Generation." The study compared flow in older participants, while either playing with the *Nintendo Wii* or the *Playstation 2 (PS2)*. Overall, the *Wii* scored higher in perceived ease of use, perceived enjoyment, perceived control of game, perceived skill, and positive feedback during gameplay. Results from five out of the nine Flow State Scale components (challenge versus skill, action awareness, clear goals, sense of control, and autotelic experience) suggested that the *Wii* console elicited higher states of flow in older participants than the *PS2*.

This may be due to the distinctive characteristics of each controller. The *Wii* remote controller is far more intuitive than its *PS2* counterpart. There are fewer buttons to memorize and the way they are used to play differs greatly, as well. Inexperienced gamers may find it difficult to learn the seemingly complex *PS2* controller as quickly as the *Wii's* for this very reason. It is apparent that varying styles of gameplay influence varying levels of social interaction, relationship

building, gamer physical movement, and happiness. This study supported the strong notion between flow state and the balance between perceived skill levels versus perceived difficulty of the game. Flow is more easily attainable when the gamer has control over the game's difficulty level. The easiest difficulty level allows for a beginner player to learn how to play the game, but also enables players to grow and become more highly skilled players at their own pace.

The study supported the notions for the potential immersive properties of digital gaming, especially with respect those playing the *Wii*. The participants found themselves in a stance similar to that of an actual golfer, tennis player, or boxer, depending on what they were playing. Some players were overly excited and immersed to the point that they were running into furniture and coming close to hitting the television screen. Certain players expressed empathy for their avatar as they were punched, displaying an experience labeled as absorption. The study noticed the importance of game content, style of play, and gamer ability with respect to player engagement, gameplay, and flow (Marston, 2013).

It must be noted that not all flow states elicit long term happiness. One extreme example of this notion is mentioned by Harari (2008). He discusses the ethical limitations of flow states experienced in combat, or combat flow. In this case, it may hinder long term happiness. In war, soldiers report experiences similar to flow; however, war is horrific and terrifying, forcing a person to make decisions that he may later regret. In the heat of battle, many of the cited soldiers explained the feeling of combat flow as a freeing, enjoyable experience, where anything outside of the present did not matter. The soldiers reported feeling good in this state, especially if their combat flow resulted in victory. Similar reports were made by soldiers in the documentary film, *Korengal* (Quested & Junger, 2014). This film covers the stories of those soldiers defending the Korengal Valley during the War in Afghanistan. These soldiers reported in the film that battle relieved the boredom, stress, and anxiety of living in the valley. During combat, they displayed and reported feelings of excitement, high arousal, deep focus, and a short lived happiness, especially

when victorious, which they often were. This happiness was soon replaced by the guilt and regret of the decisions they made and experiences they endured during battle.

On a less extreme level, there are instances of flow states, especially during digital gaming, that may hinder potential positive outcomes. Lee and LaRose (2007), discussed findings that show participants overplaying video games due to a loss of self-control. Although they may experience elation during gameplay, as soon as it ends, a feeling of regret and depression may soon follow. This can be avoided by responsible gaming practices.

For the numerous gamers experiencing a degree of flow during gameplay, it can also be said that they are extremely engaged, or immersed in this activity. This is one of the many positive outcomes influenced by a successful digital game design. There are certain components within the game design that influence stronger gamer engagement and induce longer gamer retention. The game's narrative, although important, is only one small factor that captivates and maintains a loyal, long-term player. Among the possibility of a rich, complex narrative, several other factors drive the success of the gaming industry, which include immersive components, achievements, degrees of interactivity, and social connectedness. Certain scholars and professionals have noted these important components, while others have applied them in realms of business, marketing, advertising, and education to influence active participation, enhanced engagement, and population retention. This application is called "gamification."

Gamification: The Application of Potentially Beneficial Gaming Mechanics

Before the notion of "gamification" can be addressed, it must first be understood what a game actually is. When does a random, ludic behavior become a culturally significant activity? How does this transformation take place? And who is responsible for the creation and evolution of the game? These are the questions asked by many gaming theorists. Grimes and Feenberg (2009) discuss three phases of play, ultimately resulting in rationalized play, or 'ludification.'

The Birth of a Game

Initially, a random, unorganized playfulness takes place. For example, a person randomly kicks a ball at another person. He kicks it back. The playfulness is wild and unbounding, but it is repeated and repeated, until molded into a loose form of organized play; thus completing the first phase (Grimes & Feenberg, 2009). More players join in on the fun, kicking the ball between one another. Sometimes the ball is passed around between a certain group of players and sometimes the ball is kicked far away, motivating the players to chase it. There is no specific goal of this organized play, but it is fun and people participate.

A second phase takes place when structure and rules are incorporated into the gameplay, eliminating the obscurity of play by setting temporal limits, spatial boundaries, and specifying permitted and prohibited actions for the players (Grimes & Feenberg, 2009). The players are now separated into teams of 11, with goals on either side of a 100 yard field. Each team attempts to score on the other by shooting the ball into the opponent's net. Only one of the players on each team can use hands to defend the net. The team with the most goals at the end of two 45 minute halves is the winner. In this transformation, the game design influences, and is influenced by, the players. They adapt new styles of play to complement the game design, as well as push the limits of the game's boundaries to gain advantage over the other team. A third party is appointed and responsible for maintaining a fair match from a neutral standpoint. Fouls are penalized by rewarding the other team with the ball and rules governing offside are created to prevent unfair play. The development of these rules continues, becoming more complex due to the negotiations and experiences of the players. A delicate balance must be maintained to ensure that the rules are not too simple, so as to lose player interest. The rules must not be too complex either. Players may be overwhelmed by the amount of knowledge that must be absorbed before they can successfully play the game, let alone win it. (Soute, Markopoulos, & Magielse, 2010). Eventually, the game becomes culturally significant.

The third and final transformation occurs when the game is rationalized. Grimes and Feenberg (2009) describe the five characteristics of rationalized gaming, or 'ludification,' as reflexivity (a bidirectional relationship between the gamer and the game design), boundedness (intentional and unintentional behaviors influenced by the game design), rule-governedness (laws of the system, as influenced by the level of reflexivity and boundedness), precision (the precise knowledge of player and game data), and playfulness (the player's relationship to and negotiation with the social rationalization of the game). This game becomes socially rationalized when all five of these gaming characteristics are heightened. The game of soccer is now taking off. The creation of recreational leagues inspires the formation of a professional institution governing numerous soccer leagues and teams, organizing multiple championships, and followed by a massive population of viewers inspired by the cultural context and athleticism of their favorite teams and players. The game is now technically mediated and commercialized on a grand scale. At this level, the game may even act as a form of social order.

Similar to the hypothetical example of the creation of soccer, digital games have become rationalized, as well. MMORPGs, such as *World of Warcraft*, involve the participation of a massive population of gamers, over 10 million to be more specific (Grimes & Feenberg, 2009; Blizzard Entertainment, Inc., 2015). The game is now over ten years old. Over this extended period of time, the five properties of 'ludification' influenced the evolution of a social order within and outside of the game. The rules of *World of Warcraft* have changed and developed due to the bidirectional relationship of the game and the gamer, maintaining a competitive, fair, and meaningful experience, which may contribute to *this game's* success in remaining one of the most popular MMORPGs of all time.

Due to the reflexive nature of these games and the need for gamer achievement, certain spontaneous social and cultural trends form. Styles of play develop that were never intended by the game design, but emerge out of the opportunity of simple gaming economics. Where there is a

demand, there is a supply, and in the case of *World of Warcraft*, especially, there is a tremendous need for all forms of resources and gaming currency. In order to meet the needs of many gamers, others have taken to what is termed as “farming.” For example, one gamer, who may need leather to produce armor, may seek a “farmer” to purchase these items with gold, in-game currency. Instead of spending precious hours hunting wild animals to collect leather themselves, they can save time and purchase this item from others, who spend the majority of their time collecting these various resources. This is a perfect example of the result of the reflexive world created by gamers and game developers. The initial designers of MMORPGs, like *World of Warcraft*, never intended for players to participate in the game for the sole purpose of collecting resources. These resources are not only traded within the game for other goods and digital currency, but can also be sold for real money online (Griffiths & Light, 2008). That is, the gamer in need of leather may not have enough gold to purchase those items, but they can buy any amount of gold with US dollars online.

Another cultural trend developed by gamers, not intended by the design, occurs in *Clash of Clans*. As gamers advance their clan by developing their home base and attacking other clans, they also may build their trophy count. The trophy count is based on the number of attacks/defenses won and lost. As gamers win, they earn trophies. As other gamers beat them, they lose trophies. The trophy count places the gamer in a ‘league’ with numerous other gamers based on a comparable range in the number of trophies. Gamers can earn their way up to higher leagues, which comes with higher rewards. They can also be demoted to lower leagues if their trophy count drops. The progressive intention of the game design is to promote gamer growth, earn more trophies, and graduate to higher leagues.

However, many gamers have decided to play differently depending on their goal. As one rises to higher leagues, so do other competitive, strong clans, which means that the player’s base is susceptible to an attack by a greater number of stronger opponents. As they are attacked by others and their defenses destroyed, not only do their trophies deplete, but any amount of loot can be

stolen. The more loot that is stored, the more that can be taken away by a successful attacker. Those clans “farming” resources and saving them for large upgrades or building purchases have found it difficult to maintain their high balances due to an excessive number of attacks. Obviously, those with more resources are a target for those looking to take it. So gamers purge their trophies, on purpose. This is done intentionally to demote themselves to a lower league. There, the number of worthy adversaries diminishes tremendously. One can safely store large amounts of resources without fearing numerous attacks.

Cheating emerges due to the reflexive nature of the game, the limits of the boundedness pushed by those players, and the strength or weakness of rule-governedness established by the designers and the player culture. Wherever a loophole or glitch in the design exists, gamers will catch on and take advantage of it. Researchers found a correlation that supports their notion of the cheating contagion (Blackburn, Kourtellis, Skvoretz, Ripeanu, & Iamnitchi, 2014). It seems that the increased presence of cheaters correlates with a higher likelihood of new cheaters forming. This is a prime example of how the tool may not be the problem, but the people that use it. These player-inspired gaming strategies would not exist without the necessary reflexive nature of successful games (Griffiths & Light, 2008).

Online gaming is a multi-billion dollar industry with a large, global audience. Blackburn, Kourtellis, Skvoretz, Ripeanu, and Iamnitchi (2014) examined the cultural trend of cheating among gamers. This habit comes in many forms, but in digital gaming, cheating is usually the act of implementing software components that are considered game rule violations. The study suggests that cheaters are still gamers. Aside from their one unfair practice, they are basically indistinguishable from other gamers. The study examined the cheating phenomenon within an online gaming platform called *Steam*, which grants subscribers access to over 3,500 games, entry into their exclusive social networking community, and the ability to create and improve new and existing games. Within this online system, the designers have incorporated a Valve Anti-Cheat

System (VAC). VAC is an advanced anti-cheating system that detects cheaters and effectively enables the system and other players to label them as such. From then on, all gamers within this specific gaming community are able to see if fellow gamers have ever cheated before. Gaming servers may also be adjusted to exclude players with a history of cheating. It has been found that cheaters may lose friends over time due to this label, which establishes a cultural penalty for cheating. This system maintains a fair gaming environment for its users and influences a gaming culture that defends itself from the cheating contagion suffered by numerous online games.

A theory of gamification, or the application of specific gaming dynamics for other practical purposes, rose from the rich research on digital gaming and game theory. Before this application can be utilized successfully, it is important to know what specific factors comprise an immersive, enjoyable game.

The Components of Success: Mechanics and Designs

This section will synthesize previous research and suggestions of specific gaming mechanics, which appear in the top console, PC, and mobile app games. Gaming mechanics include competition, status, rewards, progress, clear goals, multi-level gameplay, and social media components (communication, sharing, access)(Meloni & Wolfgang, 2012). Not every game incorporates all of these mechanics at once, but the majority of the most successful ones do.

Interactivity: What can I do? The first gaming dynamic concerns the level of interactivity. *Grand Theft Auto V* is a prime example of a digital game with a great degree of interactivity. The game is set in a virtual “sandbox,” a gaming term for an open map style, where all locations may be accessed at any point in the game. Players can travel to any part of the map, doing whatever they please. This constitutes an interactive environment and enables creative behavior by the gamers. *Minecraft* is another well-known game with a seemingly unlimited degree of environmental interactivity. The players are free to do as they choose in these worlds, whether it entails building it, destroying it, or anything in between.

The goal for many game designers is to create a game that supports long-term gameplay. Maintaining a certain degree of open-ended play relates with higher appeal (Soute, Markopoulos, & Magielse, 2010). Open-ended gameplay is superior to rigid gaming structures, as it allows for the gamer to play a creative role in the gaming narrative. In the case of *GTA V*, players can choose to play the campaign (main storyline), complete side jobs, or play online with or against friends. When completing the campaign, the game allows the player to decide certain outcomes, which influences an irreversible course of the narrative from that point on. The game offers an extended level of interactivity to its gamers by way of narrative. And this is one of the many desirable characteristics of *GTA* game, which may help to explain its success throughout the years. Just how successful was *GTA V*? The game was released September 17, 2013. In its first 24 hours, it sold about 11.21 million units and grossed \$815.7 million. After three days, it surpassed \$1 billion in sales. It earned six entries in the Guinness World Records that year, including “highest revenue generated by an entertainment product in 24 hours” (Lynch, 2013). The higher the level of interactivity, the more free the player is in any environment.

Achievements and “leveling up” feel good. A common mechanic found in all games is the gaming achievement. What is the reward for playing well? What is the overall goal? Winning, earning, or unlocking achievements reinforces gamer success, influencing higher competence, which not only feels good, but motivates players to keep playing (Jin, 2012). Not all achievements have a ‘virtual’ monetary value, some achievements reflect status or ability. That is, certain achievements can be exchanged for upgrades or unlock better weapons or wardrobe options for the gamer avatars. Others can be worn as an elitist badge showcasing their super ability, their veteran status, or outstanding success. The reward system is a critical aspect of most games and one of the main positive components associated with the activity (Kneer, Glock, Beskes, and Bente, 2012).

Priebatsch (2010) describes the importance of one specific achievement, status, and its real-world application. Banks have been using the status dynamic in their credit card designs,

distinguishing the basic, lower credit lines from the elite, unlimited credit lines. In this case, the elite card is of a noticeably different design. This hierarchy in card status influences customers of the bank to work towards earning the higher credit lines, not only benefiting the customer, but the bank, as well.

The majority of online games incorporate some form of the status dynamic, distinguishing the more skilled, veteran players from the rest. Perks tend to come with these hierarchal promotions. In the case of *Call of Duty*, players who “level up” earn increased weapons access and upgrades. The drive to get to that next level fuels engagement, loyalty, and fun. The competitive edge is limited to the number of levels that can be succeeded by the player. *World of Warcraft* maintained control of this level limit over its 10 year lifespan by releasing numerous expansion packs that increased the level cap from the initial limit of level 60 to the current limit of level 100 (Blizzard Entertainment, Inc., 2015).

I have a date with my game. This particular gaming dynamic is best characterized as the appointment dynamic (Priebatsch, 2010), set by the game for the player, to return at a prearranged time to complete a task, typically determined by the game design. Many mobile app games effectively apply this dynamic. If used properly, it will influence repeat visits, an action made that best characterizes a loyal gamer (Meloni & Wolfgang, 2012). One prime example of a successful “freemium,” mobile app game that effectively utilizes the appointment dynamic is *Clash of Clans*.

Since its release in 2012, *Clash of Clans* has dominated the *Apple App Store* and become the highest-grossing app overall (Tweedie, 2014). In 2013, it was estimated that this “freemium” app was earning close to \$5.15 million in revenue per day. This is an online strategy game, where gamers can build their clan base, collect resources, upgrade everything, and attack other clans. Every task in this game takes time. In the beginning, the amount of time it takes to build new buildings and upgrade defenses is minimal. At most an upgrade may take an hour or two. As the game progresses, however, the amount of time it takes to upgrade to a higher level building or

defense may take anywhere between one to two weeks. On top of that, the game requires upgrades of certain buildings before new constructions or additional upgrades of other items. The design limits gamers to owning a maximum of five builders only. Frequently, gamers find themselves balancing this appointment dynamic with their everyday lives, preparing for the next available builder.

Aside from building and upgrading, members of a common clan can participate in “clan wars.” When a team selects to enter a clan war, the game will search for a comparable opponent. Once selected, both clans have 24 hours to prepare for the war. This is done by donating defensive and attacking troops to fellow teammates, rearranging the layout of their base, training troops, and communicating a strategy with teammates. Once the preparation phase is complete, the two clans then have an additional 24 hours in the war phase to complete their attacks. During this time period, the game is requiring the gamer to return to the game on numerous occasions throughout the day.

Of course, returning for these appointments is not required. However, if gamers want to remain useful to their team, efficiently level up their clan, or earn resources at a faster rate, it would behoove them to return more often than not. Otherwise, they may find that their progress will slow down dramatically. There are ways to speed up the wait times, especially when building, upgrading, training troops, creating spells, or collecting resources, but this requires the gamer to spend gems. Gems are an extremely limited resource that can either be purchased with actual currency, or earned slowly. The average gamer can wait to earn 50 gems a week or purchase 500 for about \$5. If one were to purchase enough gems to bypass all wait times and upgrade the clan to its highest level possible, it would cost approximately \$12,000 (Tweedie, 2014). The appointment dynamic not only retains gamers and influences their return to play, but it can also influence a monetary gain as well.

Progress: How much further do I need to go? This gaming mechanic is not to be confused with status. Where the previous dynamic discussed leveling up and achieving higher status, this next dynamic considers the progression mechanic of gaming. It highlights the current progress of the task at hand. This may be the measurement of progress necessary for reaching the next hierarchical level, or it can even reflect the progress completed for the entire game. Priebatsch (2010) discusses how the progression dynamic is being used elsewhere, such as *LinkedIn*. This is a social networking website, used primarily by professionals. The website measures level of completion, or the progress, of the user's profile. This motivates users to do more with their profiles in an effort to make their profile whole. The same occurs in digital games.

Gamers attempt to complete the remaining progress needed to complete a task, level up, or complete a game. This is utilized in *Duolingo*, a free, educational, gaming app designed to teach players a new language of their choice. As the players begin a course, there is a progression bar that appears at the bottom. The game is set up into numerous '10 second' questions asking learners to translate (von Ahn, 2011). After answering each question, the progression bar fills up a little bit more. Gamers can see their current progress during play and also see how much effort is needed to complete the course.

Let's play together. The last gaming mechanic of discussion is social interaction, or as Priebatsch (2010) describes it, the communal discovery dynamic. The major distinction between gaming today and the digital gaming of the early 1980s is the ability to play with others. Multiplayer, be it cooperative or competitive, is not a new concept to digital gaming by any means. The concept of multiplayer existed with one of the original games of all time in the late 1970s, *Pong* by Atari (Braff, & Snead, 2014). *Pong* could be played competitively by two people maximum. Although games could be played solo, digital gaming from the very beginning was designed to be a social experience. Nowadays, the multiplayer experience is not limited to the number of people available to play in your living room. Today, the majority of digital games are played in a virtually

social setting, be it with friends, family, acquaintances, or complete strangers. Online social experience is a popular component among millennials.

Social networking sites have solidified their presence since the turn of the millennium (Griffiths & Light, 2008). These online platforms enable individuals to carry on with their busy lives, while staying connected with friends, loved ones, past acquaintances, etc. Since their emergence, there have been concerns with the effects of these websites and the potential disconnect between online and offline relationships. Still, Griffiths and Light (2008) argue that *Facebook*, one of the most popular social networking websites, allows for users to maintain distant relationships without distracting them from real life experiences and interactions.

Griffiths and Light (2008) discuss the challenges that may arise when social networking and digital gaming media converge. The researchers examine *Habbo Hotel*, a social network that allows users to also play games. Over time, the importance of virtual relationships and experiences, with respect to “real” ones, grows more and more. Some would consider these virtual experiences to be just as genuine and the relationships built are as real offline as they may seem online. An additional concern with social networking websites is the false profiles and potential predators that may be present online. These cases do not represent the norm, but are possible negative outcomes of such websites. It is important to note that not all aspects or effects of social networking/digital gaming sites are good, but we must not forget that they are not all bad either (Griffiths & Light, 2008).

Chesney, Chuah, Hoffman, Hui, & Larner (2014), examine the element of player cooperation in a multiplayer game, and how this is affected by player skill. Their research suggests the importance of the level/ability matching function of most multiplayer gaming. In the presence of less skilled players, experienced players tend to cooperate less. This may be due to boredom, relating with a the loss of game immersion. They note the importance of multiplayer components in digital games today. Multiplayer gameplay alone satisfies the three major incentives for digital

gaming, which are immersion (or autonomy), achievement (or competence), and social interaction (or relatedness) (Yee, 2006; Voss, 2013).

Social gaming sites are incredibly profitable. The value of Habbo, a social networking application designed in the guise of a digital game, was valued at \$550 million (Griffiths & Light, 2008). It generates a large portion of its revenue from marketing. This virtual hangout incorporates marketing tactics involving the guest appearance of a celebrity, sponsored by large corporations such as Coca-Cola, Nike, Playstation, Gillette, or L'Oreal. There are multiple locations in which to visit, communicate, and play with others. Socialization, collaboration, and social capital are integral parts of the success of this and many other digital games.

Given these components of a successful game design, it is possible to apply them to create games that more directly benefit society.

How Gamification Is Used Today

In his presentation at a *TED* conference in 2010, Priebatsch predicted the current zeitgeist of the decade to be a gaming layer, which is to replace the previous social layer of the turn of the millennium. The main theme of the era of the social layer is connection, while the main theme of the emerging gaming layer is influence. He suggests that the game layer is already being utilized, and has been for some time, by financial institutions, restaurants, schools, etc. Although these dynamics are presently used, their applications tend to be flawed, and in many cases ineffective, as they are missing an important component of gaming, which is fun. He explains that there are specific gaming dynamics (as highlighted in the previous section) that, if utilized properly, can influence behavior positively. Although the researcher did not describe the application of gaming dynamics as gamification, the notions resonate well with the theory.

Gamification may not be a new concept, but it is still young in the realm of academia. For millennia, people sought to entertain themselves actively, either alone or in social settings. It is in human nature to be playful, have fun, and enjoy life. Gamification attempts to apply this knowledge

by exploring and utilizing the factors within gaming mechanics and design that better engage, retain, motivate and promote participation in digital gamers (Meloni & Wolfgang, 2012). The goal is to make normal everyday tasks feel more like gaming. The various market segments for 'gamification,' include entertainment, retail, media and publishing, education, and healthcare/wellness. Meloni and Wolfgang's (2012) research suggests that the gamification industry is growing at a considerable rate, potentially becoming a \$3 billion industry by 2016.

In 2011, 47% of gamification vendors reported their primary reason for implementing these gaming designs (Meloni & Wolfgang, 2012) was to increase user-engagement, more than increasing brand awareness or brand loyalty. As argued before, video games are incredibly engaging. Meloni and Wolfgang (2012) explain three levels of engagement in business and marketing, which includes brand/employer engagement (the direct connection to the brand or employer), individual engagement (promotes personal discovery and expression), and communal engagement (facilitates an environment of unlimited and unrestrained interaction and team building in the community). By understanding the immersive properties of the game design, and by successfully applying them, one may increase a company's capabilities for communicating information, influencing consumer choices and behavior, increasing brand or product marketing success, and motivating, as well as, educating employees.

Meloni and Wolfgang (2012) explain that gamification benefits both the consumer and the marketer. The consumer will potentially benefit from increased popularity (prestige), the gratification of winning (the autotelic experience of gaming), and rewards (including various achievements that evolve with increased prestige). Marketers will also benefit from successfully applied gaming mechanics and designs via increased virality, accurate target audience predictions, and competitive, effective marketing. Certain desirable outcomes from these applications include a better connected company through social media components, positive team behaviors and interactions in the work environment, increased drive for meeting market goals through an

efficient incentive program, and increased employee retention, as well as, attracting new hires. The beneficial applications of gamification are apparent, but who do they benefit most? And how can they be effectively applied in education?

Millennials and the Gamification of Education

The population of interest is commonly described as Millennials, the Net Generation, or Digital Natives. They have either grown up with, or have only ever known, a world saturated by digital technology providing online access for information dissemination and gathering, as well as, a globalized social connection. Millennials are the current generation transitioning to the workforce. They were born and raised in the '80s and '90s and made their first appearance on college and university campuses at the turn of the millennium (Monaco, 2009)(Voss, 2013)(Brumberger, 2011). They own smartphones, computers, or tablets, enabling a constant connection throughout their daily lives. They are able to stay connected with friends, family, and coworkers through social media, play digital games with one another, and access an infinite source of information just by the tap of a finger. They are the most technologically savvy and socially connected generation of all time. Educators are exploring the use of new learning technologies to match the level of technology engagement, specifically by using gamification applications to enhance learner engagement.

Similar to the many generations before them, such as Baby Boomers and Gen Xers, Millennials share certain commonalities that distinguish them from the others. Generally, there are seven characteristics specific to the Millennial generation: They are achievement oriented, confident, conventional, pressured, sheltered, and special and team oriented (Monaco, 2009). Many of their commonalities are influenced by the technologically saturated environment and enhanced social networking capabilities. Due to these technological evolutions, Millennials share certain expectations and preferences.

Millennial Preferences and Expectations

Researchers suggest that generally, Millennials are more entitled than previous generations and they are critical of those who are more experienced and more knowledgeable (Holm, 2012). They are not willing to take anything for granted as they question everything. In the classroom, they expect the best service. It has become apparent that students are taking less responsibility for their education. Millennials have grown in a world where the majority of people pursue an undergraduate education. No longer are high school diplomas enough. In this day and age, Millennials are even able to earn college degrees online. This is not limited to Associate's or Bachelor's degrees either. Students are able to earn their Master's and Doctorate degrees online, as well.

Baby Boomers viewed the college experience as a privilege. This is simply no longer the case, as Millennials generally feel entitled to attend university. As the generations evolved, so did educational institutions. Today, all universities in the United States provide convenient online access, including wireless access, for their students (Holm, 2012). Courses are utilizing internet applications to allow students to submit assignments online, complete online exams, as well as receive updates and view course calendars and curricula. Educators have grown with technology to increase efficiency and to meet the needs of their students. More and more courses are supplying electronic documents to their students versus requiring the purchase of expensive books. Academic journals can easily be accessed via the university's online library, so that students do not need to travel in order to complete their research or obtain academic literature.

Tucker (2006) suggests that educators need to recognize Millennials distinctive relationship with the latest mobile and internet accessible technology. The mindset of every generation changes. Holm (2012) explains how the freshman class of 2012 possessed greater access to GPS technology; that is, they have little personal experience with reading and navigating with an actual map. They have grown with mobile access to the internet via wireless connections

and data plans. They are accustomed to immediate access to vast amounts of information at the click of a button, anytime and anywhere.

Currently, 84% of American adults, ages 18 and older, use the internet (Perrin, & Duggan, 2015). Digital gaps do persist even today. People of certain demographic backgrounds may find it more difficult to attain internet access. Those of poorer socio-economic statuses, from rural areas, and with a lower educational attainment all show lower percentages of internet access as compared to their opposites. Although adults, ages 18 to 29, continue to outdo those in other age groups for adopting and utilizing the internet. Surprisingly, senior citizens have had the greatest rate of change over the past decade and a half, from year 2000 to 2015. In 2000, 70% of young adults and 14% of senior citizens reported using the internet. Today, those numbers have risen to 96% for young adults and a staggering 58% for senior citizens, which demonstrates that not only Millennials are using internet accessible technology in their everyday lives, but that other generations are adopting them, as well. The current trend suggests that these numbers will only continue to grow and more and more people of all generations will be accessing the internet.

Over the past 15 years, less-educated adults are also accessing the internet more often. Still, Perrin and Duggan (2015) found that those with college degrees are more likely to use the internet than those with less educational attainment. Their research shows that 95% of college graduates and 66% of participants without a high school diploma in 2015 access the internet. 15 years ago, only 78% of college graduates and 19% of participants without a high school diploma were accessing the internet.

People of higher socioeconomic statuses have reported much higher levels of internet access for the past 15 years. Currently, 97% of people that live in households earning 75k or more per year use the internet. Those participants that fell in the lowest household income category of 30k or less per year reported higher usage of the internet in 2015 than in 2000. That is 34% of this population reported internet use in the year 2000. By 2015, that number has jumped to 74%.

Another study suggests that this is due to the rise of the smartphone, making internet access and the use of online applications more affordable and available for people of all socioeconomic statuses.

About 7% of Americans that own a smartphone do not have access to either a broadband connection at home or any other alternative for online access other than their smartphone (Smith, 2015). Those participants of low socioeconomic statuses, low educational attainment, non-white, and are younger adults are more likely to be smartphone dependent. About 64% of Americans own a smartphone. This number has jumped from 35% in the spring of 2011. Today, around 19% of Americans rely on their smartphone for internet access. Those who are smartphone dependent tend to struggle the most with maintaining or affording their data plans. Smith found that nearly 48% of smartphone dependent participants reported canceling their service due to financial constraints. Also, about 51% of these same participants reported maxing out their data plans occasionally, while 30% report maxing out their data plans frequently.

Smartphone use is on the rise. Smith (2015) found that participants with smartphones are using their devices for various reasons. 30% of smartphone users report using their device to take an online class or retrieve educational content. 43% of smartphone users look up info about a job and 18% of users actually submit applications for jobs. 68% of smartphone users keep up with the local and global news on their devices.

It was also found in Smith's (2015) study that 46% of smartphone users reported that they could not live without their phones, 70% perceive their devices as a source of freedom versus a technological leash, 93% find the devices to be helpful, and 80% agree that these devices are worth the cost. The devices are used for everything from navigation, information gathering, social networking, communication via phone, text, and email, capturing photos and videos, and gaming. It may be wise for educational institutions to observe the use of smartphones among their students as

this technology continues to grow in popularity. Tablets and smartphones may be a more affordable alternative to the use of laptop or desktop computers in school.

With all of these visually stimulating media and technology, it is suggested that Millennials may have grown to become primarily visual learners. There are generalizing statements in the academic world suggesting that millennials prefer visual graphics over texts when learning (Brumberger, 2011). Brumberger tackles this notion in a study by measuring visual literacy among participants. This is done by observing their use and proficiency of technologically based media and examining their ability to interpret visual media appropriately and critically. The study conducted a survey that included questions about, and requested interpretations of, multiple forms of visual mediums. The findings of this study suggested that millennials are not exceptional visual literates. In fact, the study concluded that a large number of participants preferred text-based learning approaches versus the visually oriented mediums. The majority of the participants were not able to appropriately decipher or interpret visual media in general. It is not safe to assume that people of the Net Generation are naturally visually literate. Visual literacy is taught just like verbal literacy.

This suggests that the gamification of education does not necessarily mean that an educational video game needs to be incorporated into the curriculum. In fact, it suggests that students may not necessarily benefit from this form of gaming application. Still, gamification tactics are beneficial and can be utilized in a more abstract manner. For example, the curriculum itself can be designed to include the many successful gaming mechanics making the class as a whole feel like more of a game.

Gamifying Education for Millennials: It's Worth the Investment

The millennial generation is estimated to grow over a 100 million strong, making it the largest generation by far, that is, three times larger than the Boomer generation (Monaco, 2009). This generation seeks higher academic standards, smaller and more intimate classroom sizes, a

clear grading process with quick turnaround and immediate feedback, and the integration of cutting edge technology.

Park (2014) suggests that it is worth investing in Millennials. Currently, they make up roughly a third of the workforce. In education, just as in any other business, it is important to adapt the institution around the younger generations. Millennials possess a higher degree of social connectivity and a greater knowledge for and comfort with using technology. Park (2014) explains how corporate training programs are already including gamification tactics to increase competition and engagement among employees. L'Oreal, a global cosmetics company, has been recognized for its use of successful engagement programs, including contest-based learning activities. If corporations are finding the importance of gamification applications to inspire their Millennial employees, then it is only natural for educational institutions to do the same. One of the many purposes of seeking higher education is to prepare oneself for the workforce.

It is more productive to develop an atmosphere for Millennials to promote their success versus focusing and struggling with their differences and weaknesses (Holm, 2012). As already suggested, Millennials seek recognition for their hard work and success. It may be wise to incorporate some form of achievement/trophy system to reassure this generation's need for immediate feedback. Holm explains that this generation is also eager to rise quickly within a company. This behavior is characteristic of Millennials and may seem disrespectful, naive, and arrogant to older generations, but it is also a cry out to be challenged, feel useful, and be assigned meaningful work or tasks. This is the generation motivated by efficiency, quick results, and technological assistance. Applying some form of progress mechanic may prove beneficial for Millennials as it may allow them to gauge their current progress and inform them of the amount of work ahead.

Vance (2012) suggests that Millennials are prepared and geared towards the use of Web 2.0 applications in an educational environment. Web 2.0 is the interaction and creation of data with

the use of technological and social applications. The distinction between this and Web 1.0 is that the latter is associated with only the transmittance of data from the technology to the user. Certain technologies and applications associated with Web 2.0 activities include blogging, podcasts, and social networking. With these applications, Millennials are using the technology to create, interact, and communicate. Millennials are saturated in a highly technological environment, which connects them with others around the world at a greater rate than ever before. Vance questions whether direct Web 2.0 applications are utilized in the majority of classrooms. In his study, a survey was completed by respondents giving them an opportunity to select between seven Web 2.0 application categories that would prove to benefit them and other students today. Many of the participants were attracted to the idea of incorporating blogging and other forms of social networking applications within the course curriculum. These findings are consistent with the current trends in increased internet use among students today.

The United States experienced a dramatic increase in homeschooled children over the years. In the spring of 2003, an estimated 1.1 million students were homeschooled (Princiotta & Bielick, 2006). This equates to 2.2% of the total number of students in 2003. In fact, this was a 29% increase from the population of 850,000 homeschooled students in 1999. More than 41% of these students participated in some sort of distance learning application, which consisted of digital technologies and media. Online education has become a reality at the turn of the millennium and the need for affordable, effective, digital applications is highly suggested by these findings.

Currently, an estimated 76% of students who have yet to graduate from high school use the internet (Statista, 2015f). More than 97% of college graduates are active internet users. This suggests that as people grow, along with their educational backgrounds, they are more inclined to access the web via digital technologies. In addition to these trends, e-learning (learning via electronic media) technologies are experiencing an increase in demand. It is predicted that serious gaming (potentially entertaining games designed mainly for the purpose of education and

professional training), one of the fastest growing segments of the e-learning market, is projected to grow an estimated 29.9% globally between 2012 and 2017 (Statista, 2015b). Spending on corporate e-learning (electronic, educational media specifically designed for corporate training) and language focused e-learning are also expected to increase by 20% each around the world by 2017. In fact, research projects that global, mobile educational app spending may increase from \$3.4 billion in 2011 to \$37.8 billion by 2020 (Statista, 2015d). Although the demand for mobile, educational technologies is estimated to significantly rise by the end of the decade, the question of how these technologies benefit students must be answered.

There is a potential for experiential learning through engaging digital technologies, as well as, long-term affective benefits of these applications with Millennial students. Research suggests that educational gaming may have an emotional benefit for learners (Voss, 2013). In addition, Voss posits that the efficacy of learning is greater when experienced personally; that is, active participation may elicit a better understanding in students. Traditional methods of conceptual learning may fall short due to the lack of hands on experience. Voss supports the notions that digital technologies are capable of simulating a real experience; and that this virtual experience may elicit a similar sense of hands on learning as in a real life scenario (Johnston, Boyle, MacArthur, & Manion, 2013). This idea of learning through personal experience is carried out in the world of digital gaming, as well. Voss touches on the popularity of certain games, such as *World of Warcraft* and *Minecraft*, and reiterates the common positive components of MMORPGs, such as immersion, achievement, and social interaction. In this genre of gaming, gamers are placed in an open “sandbox” environment with numerous other players. In this virtual world, players work together, or compete, to complete tasks, discover new territory, increase their avatar level, etc. Successful gaming may potentially elicit an overall positive experience, influencing a favorable outlook on education.

Shen, Callaghan, and Shen (2008) examined e-learning, an educational program delivered by information and communications technologies (ICT) and its effect on learner affect. The goal of their study is to uncover how a learner's emotions change during the learning process, and apply these discoveries to the development of a system that can effectively interpret and influence the learner's emotions. For the purpose of their study, the researchers narrowed down the potential emotions experienced when acquiring knowledge to four possibilities, including engagement, confusion, frustration, and hopefulness. They suggest that the experience of learning entails a spiraling journey between these four emotional quadrants (Q1-Q4).

Shen et al. (2008) adapted this spiraling model from past psychological research studying affective learning and go on to describe the theoretical journey of the learner. It begins in Q1, which is described as the learning stage, characterized by positive affect and high arousal. In this phase, learners are interested in the topic, inspired to learn, and are absorbing knowledge with little difficulty. It is an enjoyable experience and relates strongly with higher learner engagement. As they hit a cognitive obstacle, they transition to Q2, which is the next stage of the spiral model that is characterized by negative affect and high arousal. It is the emotional state of confusion, a struggle that takes place due to a misunderstanding in the lesson. As this misunderstanding becomes overwhelming, the learner continues into the next stage, Q3, which is frustration. The learner is experiencing negative affect and low arousal as the ability to overcome their confusion seems impossible. From there, the learner may discover a breakthrough in understanding that inspires an emotional change toward positive affect in the low state of arousal. This is Q4, or the emotional state of hopefulness, which motivates learners to continue the lesson, spiraling them back into Q1, the engagement phase, once again finding themselves in an enjoyable state. This is formulated into four-quadrant model with the x-axis measuring affect and the y-axis measuring the state of arousal.

Shen et al. (2008) effectively measured the emotional response from participants during an e-learning session, relating the strength of the response to the level of engagement, confusion,

frustration, and hopefulness. The findings suggest that the spiral learning theories are not necessarily practical in real-life scenarios. Although these theories set a solid foundation for the area of affective learning research, the emotional journey of the learner is dependent on the content, as well as the disposition of the participant and the difficulty of the study. Participants did not experience a full spiral around the theoretical model in most cases. The study found that the realms of affective learning most visited by their participants were the engagement and confusion quadrants, which suggests that it is not necessary to visit all quadrants in order to gain knowledge. Since it is possible to learn without visiting all of the affective quadrants, then it may be possible to assist students by incorporating gamification tactics to better maintain their engagement during the learning process and potentially help them to succeed.

Beylefeld and Struwig (2007) found that by applying an educational board game in a course on medical microbiology, students' enthusiasm was heightened with respect to the course content. Aside from benefitting from the learning experience, it is also understood that games are popular simply because they are fun. Although learning was not on a notably high degree, there is evidence of flow experienced by those learners participating in the game, which increased learner motivation due to the fun properties of play. Fun is obviously one of the most important aspects of any game. If the game is not fun, then it is not worth playing. This is especially important in game styles that are essentially repetitive. For example, sports games or multiplayer first-person shooter games maintain the same narrative or overall objective. In *Call of Duty's* multiplayer game, the game does not really change; players continue to fight other players, over and over again. Still, it is fun and so players play on. For many educational games, this is simply not the case. There is usually some form of lesson that needs to be communicated, which may take place in many different formats. The problem with these types of games is that when the lesson is learned the game is complete and the fun tends to end there (Soute, Markopoulos, & Magielse, 2010). This is another example of how a more abstract application of gamified education may benefit student higher learning. If the entire

curriculum is gamified in an effective manner, then the entire course becomes more engaging and fun. On the other hand, if an educational game is included in the curriculum, then it may be the only engaging aspect of the entire class.

Although some educational games suffer from this dilemma, others have adapted the successful mechanics that maintain gamer retention. *Duolingo*, an educational gaming app designed to teach foreign languages, has demonstrated the successful utilization of engaging mechanics found in popular game designs. It shows that gaming can be used to benefit society and education.

Potential Benefits of Gamifying Education

There are numerous avenues for gamifying educational applications to benefit society. For example, Soute, Markopoulos, & Magielse (2010) support the idea of Head Up Games (HUGs), which combine the beneficial aspects of pervasive, modern technology and traditional outdoor play, ultimately enhancing physical activity in children through intrinsically motivated, educational gaming. Exercise is beneficial to the human body and psyche. Exercise is something that tends to be lacking in the design of most digital games, but there are systems and games that have incorporated this dynamic successfully. The concern is that child's play is moving away from the types of active, hands on, socializing styles of play, like tag, hide-and-go-seek, or ball games. In a world full of various forms of media entertainment like the television, gaming consoles, computers, smart phones and tablets, children are spending less time outdoors and more time in front of a screen, which is argued to be detrimental to a child's development. It limits their social interactions with their peers, hindering creative and moral development. This is a prime example of how activities as a whole can be gamified rather than incorporated an actual game. Still, there do exist educational games that have proven to benefit their users and society in general.

Duolingo: A successful educational gaming application. An example of well applied gamification mechanics in an educational gaming application can be seen in *Duolingo*. This is a free

gaming app developed to teach users new languages, although this was not the main agenda of the application as explained by Luis von Ahn (2011). Initially, the developers of *Duolingo* were attempting to translate the internet by effectively influencing people to offer their free time and aid in this task. They developed a game that would not only help the gamer to learn a new language, but also teach their software how to effectively and appropriately translate one language into another. As *Duolingo* is played, the game presents users with opportunities to translate the foreign language into their native tongue. Not only are players practicing translating the foreign language, they are demonstrating the socially correct, or acceptable, way to phrase a similar sentence or question in their own language, thus, teaching the computer the proper, or most popular, language syntax.

This is a truly beneficial game for the individual and for society as a whole. The developers understood the engaging components of successful mechanics and utilized these in their design. *Duolingo* assists these developers in translating the internet at the most rapid and affordable way possible. It also benefits those interested in learning a new language at virtually no cost (von Ahn, 2011).

Based on the discussion, *Duolingo* possesses the key components of a successful game design. The appointment dynamic is established by a notification system that reminds users to return and play the game. The game also measures the streaks of days played, encouraging gamers to break new records every day. Player progression is displayed during each lesson, as well as in the main menu for the entire course. Players can see their progress, how well they did, and also future lessons. With each successful completion of a lesson comes an opportunity to earn achievements in the form of "lingots," which can be spent in the game store to purchase new attire for the user's owl, the mascot of *Duolingo*. They can also be spent on extra lessons specific to flirting in those foreign languages, as well as learning popular idioms.

Social play is also a possibility with *Duolingo*. Players can compete against others, which increases the level of challenge maintaining a higher level of interest. The level of challenge of the game also increases as players progress through the lessons. The more they play, the better skilled they become, and the more they progress.

Future Research

Gamification is the wave of the future and it is currently influencing the most change in the entertainment industries and corporate worlds (Meloni & Wolfgang, 2012). The current study suggests that education is an industry awaiting a potential boom in gamification applications. This is still a young topic and much research is needed to clarify how gamification works, whom it works for, and why it is worth incorporating.

It would be beneficial for gamification research to observe and measure the effectiveness of more complex gamification tactics. That is, those applications that are applied to an activity, corporate structure, or educational curriculum as a whole. It is one thing to include an educational game in a course. This may add a different dynamic to the curriculum, but it is only one dynamic and it is suggested that this does not always benefit the student academically. It may be more worth while to dissect the current traditional course structure and create a new design that incorporates the successful gaming mechanics.

There are also numerous limitations in gamification, game theory, and digital gaming research. For example, an unprecedented amount of data is being collected by online gaming companies. This is quite possibly the most extensive, complex multimodal data source on the planet, containing information such as player bios, avatar representation, player movement, player-versus-player interaction, player-versus-virtual-environment interaction, affective responses to game experiences, and more. When deciphering game data, it is important to distinguish human psychological and social phenomena from cultural gaming trends dependent on game design and achievements, including the difference between in-game characters and real-world players; that is,

avatar behavior may not be a valid predictor of human behavior. Avatar identity and player identity are more often than not two distinct personalities (De Castell, Jenson, Taylor, & Thumlert, 2014).

Online phenomena versus offline phenomena tends to be a popular discussion in digital gaming studies, as researchers search for the relationships between the two; for example, a player's avatar gender identification as compared to their real world gender identification is a relevant and rich topic of interest. Much research would hope to find that the two are somehow related, but there is a disconnect between virtual and real world experience in most cases such as these and it is important to understand that gaming in this instance is no different than any narrative, except in this narrative the player gets to participate. This active participation tends to inspire psycho-social researchers because of the belief that the decisions made during gameplay represent the values or the choices that people would make in reality. This is not the case. We cannot assume that past methodological frameworks will apply to new digital experiences in virtual worlds during gameplay (De Castell, Jenson, Taylor, & Thumlert, 2014).

Gaming researchers may need to revisit their ethical boundaries with respect to participant consent as many studies gain permission from participants via the game disclosure. Gamers are typically unaware that their consent is given when accepting the 'terms and conditions' of the game. Unfortunately, the practice of studying gamers without their consent is a growing trend in the field of digital gaming research. This may be impeding on gamers' privacy rights and may be considered an unethical practice (De Castell, Jenson, Taylor, & Thumlert, 2014).

There seems to be a blur in the distinction between "game" and "media" audience in past research (Boyer, 2013). Media exposure is one of the main variables quantified to reflect audience measurements and ratings. This variable may not reflect a successful gamer and game interaction. Games require active participation, so one must do more than be exposed to the game. They must be engaged in their gameplay. The significance of media engagement, a key factor of interest when

studying gamer audiences, was overshadowed by exposure in media research because exposure is more easily quantified. Currently, game researchers are more interested in behavioral data and find this more applicable to the process of creating a game. There are four suggested categories of metrics measuring active user behaviors in gamification: engagement (number of page views, time spent on site, or other unique visits), loyalty (repeat visits or refer a friend situations), virality (sharing or social communications), and monetization (conversion rates, virtual goods, or registration)(Meloni & Wolfgang, 2012).

Finally, qualitative video game research tends to examine the gamer experience through participant observations or structured interviews. On the other hand, quantitative research in this discourse tends to rely on self-reports from surveys, as well as the gathering of vast quantities of data from gaming companies. It is important to include both methods of research within a video game study, so that the strengths of one method cover the faults of the others.

Conclusion

The public and academic view of digital gaming is influenced greatly by a traditional stance on the negative outcomes associated with these activities. This includes, but is not limited to the studies surrounding video game addiction, impaired social skills, and gamer isolation. Ethical and moral development is a major concern for those opposed to violent, vulgar video games. There is, however, a growing discourse focused on the positive effects of digital gaming, such as affective benefits, increased user engagement, and positive gaming concepts. There is potential for applying the highly effective gaming mechanics for the benefit of the individual gamer and society. This application is referred to as gamification, a growing concept utilized by many realms of the marketplace. It is suggested that gamification applications are popular and effective among Millennials. Education is an interesting area of study with respect to gamification applications. It is suggested by the research that education may benefit from a blended teaching approach that incorporates educational gaming in the entire curriculum. Simply including an educational game

into a course curriculum is not enough. Studies show that this does not necessarily benefit higher learning in students, as not all Millennial students are visually literate. The successful gamification of education will exist in the application of the known effective gaming mechanics into the overall design of the course. Not only will students feel better about their educational experience as a whole, but their performance in class may also benefit from such an application.

References

- American Psychiatric Association. (2013). Substance-related and addictive behaviors. In *Diagnostic and statistical manual of mental disorders (5th ed.)*. Retrieved from <http://0-psychiatryonline.org.libraries.colorado.edu/doi/book/10.1176/appi.books.9780890425596>
- Bavelier, D. (2012). Your brain on video games. [Online Video] *Ted Conferences, LLC*. Retrieved from http://www.ted.com/talks/daphne_bavelier_your_brain_on_video_games.html
- Becker-Olsen, K.L., & Norberg, P.A. (2010). Caution, animated violence: Assessing the efficacy of violent video game ratings. *Journal of Advertising, 39*(4), 83-94.
- Beylefeld, A.A., & Struwig, M.C. (2007). A gaming approach to learning medical microbiology: Students' experiences of flow. *Medical Teacher, 29*, 933-940.
- Blackburn, J., Kourtellis, N., Skvoretz, J., Ripeanu, M., & Iamnitchi, A. (2014). Cheating in online games: A social network perspective. *ACM Transactions on Internet Technology, 13*(3), 1-25.
- Blizzard Entertainment, Inc. (2015). *Blizzard Timeline*. Retrieved from <http://us.blizzard.com/en-us/company/about/b20/timeline.html>
- Boyer, S. (2013). Constructing and measuring an 'audience' for digital games. *Journal of Gaming & Virtual Worlds, 5*(2), 183-200.
- Braff, Z. (Producer), & Snead, J. (Director). (2014). *Video Games: The Movie* [Motion Picture]. USA: Mediajuice Studios.
- Brumberger, E. (2011). Visual literacy and the digital native: An examination of the Millennial learner. *Journal of Visual Literacy, 30*(1), 19-46.
- Cameron, S. (2007, July 10). Addicted to "addiction." *NPR*. Retrieved from http://www.npr.org/blogs/talk/2007/07/addicted_to_addiction.html

- Chesney, T., Chuah, S., Hoffman, R., Hui, W., & Larner, J. (2014). Skilled players cooperate less in multi-player games. *Journal of Gaming & Virtual Worlds*, 6(1), 21-31.
- Chory, R.M., & Banfield, S. (2009). Media dependence and relational maintenance in interpersonal relationships. *Communication Reports*, 22(1), 41-53.
- Clark, L.S. (2011). Parental mediation theory in the digital age. *Communication Theory*, 21, 323-343.
- Csikszentmihalyi, M. (2000). Beyond boredom and anxiety: Experiencing flow in work and play (25th Anniversary ed.) (pp. 1-12, 35-54). San Francisco, CA: Jossey-Bass. (Original work published 1975).
- De Castell, S., Jenson, J., Taylor, N., & Thumlert, K. (2014). Rethinking foundations: Theoretical and methodological challenges (and opportunities) in virtual worlds research. *Journal of Gaming & Virtual Worlds*, 6(1), 3-20.
- De Schutter, B. & Vanden Abeele, V. (2010). Designing meaningful play within the psycho-social context of older adults. *Fun & Games*, 13-15.
- DeFleur, M.L., & Lowery, S.A. (1995). Milestones in Mass Communication Research: Media effects (3rd ed.). White Plains, NY: Longman Publishers USA.
- Festl, R., Scharnow, M., & Quandt, T. (2012). Problematic computer game use among adolescents, younger and older adults. *Society for the Study of Addiction*, 108, 592-599.
- Frau-Meigs, D., & Meigs, D. (2009). Socializing young people to ethics via play experience: Browser games and parental concerns for safety online. *Global Media Journal – Canadian Edition*, 2(1), 89-106.
- Griffiths, M. & Light, B. (2008). Social networking and digital gaming media convergence: Classification and its consequences for appropriation. *Information Systems Frontiers*, 10, 447-459.

- Grimes, S. M. & Feenberg, A. (2009). Rationalizing play: A critical theory of digital gaming. *The Information Society, 25*, 105-118.
- Harari, Y.N. (2008). Combat flow: Military, political, and ethical dimensions of subjective well-being in war. *Review of General Psychology, 12*(3), 253-264.
- Holm, T.T. (2012). Managing Millennials: Coaching the next generation. *The Forensic of Pi Kappa Delta, 25*-38.
- Hunt, K., & Ng, N. (2015, January 19). Man dies in Taiwan after 3-day online gaming binge. *Cable News Network*. Retrieved from <http://www.cnn.com/2015/01/19/world/taiwan-gamer-death/>
- Jin, S.A. (2012). "Toward integrative models of flow": Effects of performance, skill, challenge, playfulness, and presence on flow in video games. *Journal of Broadcasting and Electronic Media, 56*(2), 169-186.
- Johnston, B., Boyle, L., MacArthur, E., & Manion, B.F. (2013). The role of technology and digital gaming in nurse education. *Nursing Standard, 13*(27), 35-38.
- Kaye, L. K., & Bryce, J. (2014). Go with the flow: The experience and affective outcome of solo versus social gameplay. *Journal of Gaming & Virtual Worlds, 6*(1), 49-60.
- Kirsh, S.J. (2010). Media in the lives of youth. In *Media and youth: A developmental perspective*. Malden, MA: Wiley-Blackwell.
- King, D.L., Delfabbro, P.H., & Griffiths, M.D. (2010). Recent innovations in video game addiction research and theory. *Global Media Journal – Australian Edition, 4*(1), 1-13.
- Kneer, J., Glock, S., Beskes, S., & Bente, G. (2012). Are digital games perceived as fun or danger? Supporting and suppressing different game-related concepts. *Cyberpsychology, Behavior, and Social Networking, 15*(11), 604-609.
- Lee, D., & LaRose, R. (2007). A socio-cognitive model of video game usage. *Journal of Broadcasting & Electronic Media, 51*(4), 632-650.

- Lemmens, J.S., Valkenburg, P.M., & Peter, J. (2009). Development and validation of a game addiction scale for adolescents. *Media Psychology*, 12, 77-95.
- Lynch, K. (2013, October 8). Confirmed: *Grand theft Auto 5* breaks 6 sales world records. *Guinness World Records*. Retrieved from <http://www.guinnessworldrecords.com/news/2013/10/confirmed-grand-theft-auto-breaks-six-sales-world-records-51900/>
- Marston, H. R. (2013). Digital gaming perspectives of older adults: Content vs. Interaction. *Educational Gerontology*, 39, 194-208.
- Meloni, W., & Wolfgang, G. (2012). Gamification in 2012: Market Update, Consumer and Enterprise Market Trends. *M2 Research*, 1-25.
- Monaco, M. (2009). The flight of the Millennials in higher education. *Human Kinetics*, 14(1), 21-26.
- Murray, J.H. (2006). Toward a cultural theory of gaming: Digital games and the co-evolution of media, mind, and culture. *Popular Communication*, 4(3), 185-202.
- Park, A. (2014). How much should you invest in young talent? *Media Tech Publishing, Inc.*, 39-48.
- Perrin, A. & Duggan, M. (2015). Americans' Internet Access: Percent of Adults 2000-2015. *Pew Research Center*, 1-9.
- Petry, N.M. (2013). Commentary on Festl et al. (2013): Gaming Addiction - how far have we come, and how much further do we need to go? *Society for the Study of Addiction*, 108, 600-601.
- Priebatsch, S. (2010). Building the game layer on top of the world. [Online Video] *Ted Conferences, LLC*. Retrieved from http://www.ted.com/talks/seth_priebatsch_the_game_layer_on_top_of_the_world?language=en

- Princiotta, D., & Bielick, S. (2006). Homeschooling in the United States: 2003. *National Center for Education Statistics, U.S. Department of Education*, 1-41.
- Quested, N (Producer), & Junger, S. (Director). (2014). *Korengal* [Motion Picture]. USA: Goldcrest Films.
- Seligman, M.E.P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychological Association*, 55(1), 5-14.
- Shen, L., Callaghan, V., & Shen, R. (2008). Affective e-Learning in residential and pervasive computing environments. *Information Systems Frontiers*, 10, 461-472.
- Smith, A. (2015). U.S. smartphone use in 2015. *Pew Research Center*, 1-5.
- Soute, I., Markopoulos, P., & Magielse, R. (2010). Head up games: Combining the best of both worlds by merging traditional and digital play. *Personal & Ubiquitous Computing*, 14, 435-444.
- Stavrou, N.A., Jackson, S.A., Zervas, Y., & Karteroliotis, K. (2007). Flow experience and athlete's performance with reference to the orthogonal model of flow. *The Sports Psychologist*, 51, 438-457.
- Statista. (2015a). *Age breakdown of video game players in the United States in 2015*. Retrieved from <http://www.statista.com/statistics/189582/age-of-us-video-game-players-since-2010/>
- Statista. (2015b). *Compound annual growth rate of the fastest-growing e-learning segments worldwide from 2012 to 2017*. Retrieved from <http://www.statista.com/statistics/273946/cagr-of-the-fastest-growing-e-learning-segments-worldwide/>
- Statista. (2015c). *Distribution of digital games industry revenue in the United States in 2014, by game category (in billion U.S. dollars)*. Retrieved from

<http://www.statista.com/statistics/379682/digital-games-revenue-distribution-category-usa/>

Statista. (2015d). *Global mobile education market volume from 2011 to 2020 (in billion U.S. dollars)*. Retrieved from <http://www.statista.com/statistics/273960/global-mobile-education-market-volume/>

Statista. (2015e). *Most popular Apple App Store categories in March 2015, by share of available apps*. Retrieved from <http://www.statista.com/statistics/270291/popular-categories-in-the-app-store/>

Statista. (2015f). *Share of internet users in the United States in 2014, by educational background*. Retrieved from <http://www.statista.com/statistics/327138/internet-penetration-usa-education/>

Statista. (2015g). *Worldwide app category revenue distribution in the Apple App Store in February 2014, by business model*. Retrieved from <http://www.statista.com/statistics/283753/apple-app-store-global-category-revenue-share-per-business-model/>

Statista. (2015h). *Worldwide market share of mobile applications stores in 4th quarter 2012, by download volume*. Retrieved from <http://www.statista.com/statistics/183469/global-market-share-of-mobile-apps-stores-by-download-volume/>

Sydell, L. (2013, September 20). Female fans love new *Grand Theft Auto* despite demeaning content. *NPR*. Retrieved from <http://www.npr.org/blogs/alltechconsidered/2013/09/20/224300193/female-fans-love-grand-theft-auto-v-hate-it-demeans-women>

Tucker, P. (2006). Teaching the Millennial generation. *The Futurist*, 7.

- Tweedie, S. (2014, September 25). Why 'Clash Of Clans' is so incredibly popular, according to a guy who plays 16 hours a day. *Business Insider, Inc.* Retrieved from <http://www.businessinsider.com/why-clash-of-clans-is-so-popular-2014-9>
- Vance, L.K. (2012). Do students want Web 2.0? An investigation into student instructional preferences. *Journal of Educational Computing Research, 47*(4), 481-493.
- von Ahn, L. (2011). Massive-scale online collaboration. [Online Video]. *TED Conferences, LLC.* Retrieved from http://www.ted.com/talks/luis_von_ahn_massive_scale_online_collaboration?language=en
- Voss, G. (2013). Gaming, texting, learning? Teaching engineering ethics through students' lived experiences with technology. *Science & Engineering Ethics, 19*, 1375-1393.
- Watson, D., Clark, L.A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales, *Journal of Personality and Social Psychology, 54*(6), 1063-1070.
- Weaver, A.J., & Lewis, N. (2012). Mirrored morality: An exploration of moral choice in video games. *Cyberpsychology, Behavior, and Social Networking, 15*(11), 610-613.
- Yee, N. (2006). Motivation for play in online games. *CyberPsychology & Behavior, 9*(6), 772-775.