STUDENTS’ EXPERIENCES WITH GAMES AND THEIR ACADEMIC POTENTIAL: AN INTERPRETATIVE PHENOMENOLOGICAL ANALYSIS

A thesis presented by Sergio Pisano to The School of Education in partial fulfillment of the requirements of Doctor of Education in the field of Education

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Abstract

The purpose of this research project was to explore students’ gaming experiences in relationship to engagement and learning to expand our understanding of the essence of such experiences and produce valuable results for educators seeking to create a more student-centered learning environment, facilitate active learning, and increase students’ engagement. Utilizing flow theory as theoretical framework and Interpretative Phenomenological analysis, this study explored the gaming and academic experiences of five college students. Participants’ interviews, transcriptions, annotations and preliminary analysis led to the emergence of five core themes: (1) manifestations of flow; (2) engagement, expectations, and feelings; (3) health related issues in games; (4) social aspects of games and learning; (5) games, learning, and the real world. The analysis of participants’ interviews and additional data pointed out a variety of engaging factors the typical classroom experience lacks, but that were found to be abundantly present in certain games. Several important implications were found and discussed. These included implications related to: engagement and active learning; motivation and feelings; social dynamics; teaching, learning, and the teachers’ role; teaching, learning, and the real world; game based learning; institutional support and faculty development; and the gaming field. This study’s findings supported the idea of incorporating games and gamification in the college classroom. Transporting certain factors present in games to the classroom in the form of positive and memorable experiences was not only desired by students but also important for their engagement and academic success.

Keywords: engagement, game based learning, flow
Dedication

I dedicate my dissertation work to my family and spiritual mentors. A special feeling of gratitude to my loving wife Mei, my mother, Ana Maria, and my father, Vittorio whose example, help, and encouragement made all possible.
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Chapter 1: Introduction

It is early in the morning and students are seated in their college classrooms for the first time. Soon after introductions, the syllabus is reviewed and the professor starts talking about the different topics that need to be covered for the class. Besides the occasional question or brief discussion, the traditional lecture has started and will continue mostly unchanged in every session, something that drives many students’ minds to wonder while the professor’s voice fades in the background of their thoughts as they reach for anything available that would make their time in class more enjoyable. Over time, these type of classes become a monotone routine that fail to gain students’ attention for more than just a few minutes (Khan, 2012; Robinson & Kakela, 2006; Wilson & Korn, 2007; Young, Robinson, & Alberts, 2009) and lead them to passively receive information in order to robotically complete assignments. Eventually, students become disengaged and their original enthusiasm and excitement about college fades away together with the possibility of becoming actively engaged in their learning. It is easy to see how in this scenario how students’ academic performance would significantly decrease while dropouts would increase, and eventually damage the quality of our educational system.

Students born after 1990, also referred to as generation Z (Geck, 2007), entered a society where technology had progressed significantly, computing devices became pervasive, and information became extremely accessible while instantly available. This generation of students is considered more social, self-directed, and able to quickly process information (Igel & Urquhart, 2012), but it is also more easily distracted (Ding, Guan, & Yu, 2017) and in need of novel ways to grab and retain their attention. While students’ ways of learning are evolving, our educational system is confronted with important challenges that demand a departure from conventional teaching methods.
The Research Problem

The effectiveness and engagement potential of traditional teacher-centric lectures have been questioned by many scholars (Aljezawi & Albashtawy, 2015; Frederick, 1986; Khan, 2012; Middendorf & Kalish, 1996; Robinson & Kakela, 2006; Svinicki & McKeachie, 2006; Wilson & Korn, 2007). In parallel, the quality of our educational system continues to fall in comparison to other countries (OECD, 2012), students’ grades keep lowering (Payne, 2008), and engagement consistently decreases as students get older (Brenneman, 2016, March 22). While it is generally accepted that students’ attention and engagement play an important role in the effectiveness of learning and could be determinant for academic success (Coates, 2005, 2010; Floyd, Harrington, & Santiago, 2009; Jagannathan & Blair, 2013; Krause & Coates, 2008; Trowler, 2010), the use of orthodox teacher-centric lectures still remain the most commonly used teaching method in higher education (Khan, 2012).

In spite of the general agreement among scholars about the benefits of student-centered lessons in comparison to traditional lectures (Granger et al., 2012; Middendorf & Kalish, 1996; Moura & Van Hattum-Janssen, 2011; Robinson & Kakela, 2006; Sahin & Abichandani, 2013), there is still a lack of general best practices and methods for their implementation. Two approaches that have recently gained attention and that are the focus of this research are Game Based Learning (GBL) and Gamification. GBL involves using games for educational purposes while Gamification aims to incorporate game elements such as points, levels, badges, and awards to educational lessons (Deterding, Dixon, Khaled, & Nacke, 2011; Isaacs, 2015; Kingsley & Grabner-Hagen, 2015; "What is Gamification?," 2015).

The increasing number of studies suggesting the academic potential of games (A. Huang & Levinson, 2012; Mayo, 2009; Neef, Perrin, Haberlin, & Rodrigues, 2011; Rosser et al., 2007),
suggest that their importance and relevance should not be overlooked. Considering $14.80 billion was spent in the United States on video game content in 2012 (Riley, 2013) and 97% of all American teenagers play video games (Amanda Lenhart et al., 2008), the increasing popularity of these tools present significant academic opportunities. It has been found that when applied correctly, these novel methodologies have the potential to greatly increase students’ engagement, attention span, and other related issues that can significantly influence students’ academic success (Aljezawi & Albashtawy, 2015; Claman, 2015; Entertainment Software Association, 2014; A. Huang & Levinson, 2012; M. Jong, J. Shang, F. L. Lee, & J. Lee, 2008; Sanchez Martin, Yu-Ju, & Tsun-Ju, 2014; Simões, Redondo, & Vilas, 2013; Tews, Jackson, Ramsay, & Michel, 2015).

**Deficiencies in the Evidence**

Although some studies have addressed the use of GBL and Gamification in adult teaching and learning (Aljezawi & Albashtawy, 2015; Coleman, 2012; A. Huang & Levinson, 2012; Korolov, 2013; Ryoo, Techataassanasontorn, Lee, & Lothian, 2011; Tews et al., 2015), the majority of the research have remained confined within the elementary, middle, and high school educational levels. In addition, their application in post-secondary education together with their impact on higher learning have remained largely unexplored (Perrotta, Featherstone, Aston, & Houghton, 2013) and in clear need of further study. By examining college students’ experiences with games and Gamification a better understanding can be reached about factors that can make them effective academic tools. Furthermore, understanding how these student-centered methods can influence college students’ engagement not only help to improve the quality of teaching at the college level, but also bring us closer to a general set of best practices that will broaden their implementation and integration with more traditional teaching methods.
Significance of Research Problem

The predominant lecturing method in our classrooms (Khan, 2012) is in clear need of variations and alternatives in order to improve our teaching effectiveness. The fact that younger generations are growing up spending an average of 7:38 hours per day involved with various media (Rideout, Foehr, & Roberts, 2010) and the consistent growth of game usage and popularity (Association, 2016; Markert, 2016, May 12), points towards the special relevance, influence, and importance of games in our current generation of students. In higher education, the use of games has been mostly relegated while play is generally regarded as a purely entertainment activity without seriously reflecting on its teaching and learning potential.

Considering the fact that GBL and Gamification can significantly increase students’ engagement and have a positive impact in the effectiveness of learning (Entertainment Software Association, 2014; Mayo, 2009; Middendorf & Kalish, 1996; Neef et al., 2011; Robinson & Kakela, 2006; Tews et al., 2015), dismissing games’ potential in higher education is a negligent mistake that should not be ignored. Understanding more about students’ experiences with games and their engaging qualities help us maximize their academic impact and reach a more common set of practices that could be applied to increase their effectiveness, facilitate their application, and widen their usage in education. Furthermore, considering the current problems affecting our educational system (Brenneman, 2016, March 22; OECD, 2012; Payne, 2008), finding new and more entertaining teaching methods that can gain students’ attention for longer periods and place them in the center of their learning is of great importance and determinant in the quest for effective teaching.

Research Question

Qualitative research is interested in “understanding the meaning people have constructed,
that is, how people make sense of their world and the experiences they have in the world” (Merriam, 2009, p. 13). Similarly, qualitative studies using an Interpretative Phenomenological Analysis (IPA) approach focus on questions that are open, and ask about “people’s understandings, experiences and sense-making activities” (Smith, Flowers, & Larkin, 2009, p. 47). Smith et al. (2009) remark how the words “exploring”, “investigating”, “examining”, and “eliciting”, are most commonly used to state IPA researchers’ goals and actions while Creswell (2012) indicates how qualitative studies should use the words “what” or “how” in order to “explore a central phenomenon” (p. 138).

This study proposed the following overreaching research question: what are students’ gaming experiences in relationship to engagement and learning? Finding answers to this research question allowed this study to explore the gaming “phenomenon”, or “experience”, and expanded the understanding of its essence. In turn, this produced valuable results for educators seeking to create a more student-centered learning environment, facilitate active learning, and increase students’ engagement.

**Positionality Statement**

Being a student and a teacher for many years and in different countries has given me an interesting perspective on the problem of students’ engagement in the classroom. I have experienced firsthand the difference between teaching styles and methods and how some traditional lectures can lose students’ attention in just a few minutes while others that are mixed with interactive elements can create more engaging learning environments. In my experience, the instructional methods that a teacher uses in class can make a significant difference in students’ engagement and is something that should be studied in detail in order to promote students’ academic success (Coates, 2005, 2010; Floyd et al., 2009; Jagannathan & Blair, 2013;
I believe that being in the classroom should not only be about transmitting information, but also about sharing ideas, creating relationships, motivating students, encouraging critical thinking, having fun, and generating memorable experiences. As a scholar-practitioner, my positionality has giving me a unique perspective in the problem of students’ lack of engagement. It has also lead me to research new teaching methodologies like GBL and Gamification, that may address some of our current students’ engagement problems and enrich their learning experiences.

When thinking about games as tools to promote academic engagement, I realize that my personal experiences and beliefs are influenced by specific factors that are part of my positionality and can influence my research (Jupp & Slattery, 2010). One of these factors is my relationship with games. I will never forget when I was about eight years old and received as a Christmas gift an “Atari 2600” electronic game console complete with several games and controls. I remember how the games for this console were accompanied by manuals and instructions that would give clues to solve different puzzles and quests. These manuals were all written in English, a language that was strange to me at the time; and that represented a much greater challenge to overcome in my determination to reach the games’ objectives. These challenges drove me to learn how to solve problems using a trial and error approach, learn how to use my first dictionary, develop an avid interest in literature, and take my first steps towards learning a new language.

My interest in games continued in high school with the introduction of personal computers. Computers not only increased the sophistication and interactivity of games, but introduced me to much more complex challenges that required specific knowledge and expertise
(e.g., installing and troubleshooting new hardware and software). Furthermore, in the South American city where I grew up, the information that I needed was not easily available, accessible, or comprehensible for me in those early years. Yet the challenges presented by some games motivated me to visit bookstores and libraries in what I considered a quest for knowledge in order to help me solve a technical problem or a game’s riddle. This quest also drove me to socialize with classmates who were playing the same games or trying to solve similar problems. I have many memorable moments where my friends and I would brainstorm ideas and share clues that would allow us to overcome a technical obstacle or game’s quest. Games became a stimulating and shaping mental challenge in my life; a catalyst for study, research, collaboration; and, in many ways, an initiation to my engineering “problem solving” training.

These personal experiences together with my professional background will bring unique advantages to my selected research process. For example, my engineering training combined with my academic knowledge, technical expertise, and teaching experience, prove invaluable in meeting the complexities associated with implementing GBL and Gamification strategies in the classroom. The results obtained from this research will better inform my teaching practices and improve the quality of my work as an educator and scholar-practitioner.

**Researcher’s Influence and Transparency.** My experiences and identity have inspired me toward choosing my proposed line of research. Although it is my belief that carefully planned and organized mixing of what is generally labeled as “fun” with “work” bring significant benefits to students, I realize that my definitions of these terms are influenced by personal factors including my positionality (Jupp & Slattery, 2010). Having been born in Venezuela from an Italian family that later immigrated to the United States of America, it is obvious that positionality in relationship to my cultural frameworks, as defined by Jupp and
Slattery, could be a key bias factor that requires reflection in order to understand all of its dimensions and ramifications (Briscoe, 2005). Briscoe (2005) argues that “it seems incontrovertible that differences do matter in the way that we interpret our social world” (p. 35), inferring that identifying personal influencing traits and experiences becomes necessary and vital for any researcher. Being aware of these differences and placing careful attention on avoiding “deficit thinking” (Jupp & Slattery, 2010) or any form of discriminatory profiling is important for any research.

In order to maintain transparency, I was committed to remain aware of my positionality and its influence by having a clear understanding of the meaning of “self” and realizing how we are all interconnected in our society. Briscoe (2005) reflected on how we are united in our differences and how “the other is always within us” (p. 30). This brilliant remark illustrates how each of us contain all of humanity’s differences and traits while remarking the significance that this realization brings to our lives as research-practitioners.

While understanding the researchers’ influence in a study is important, maintaining research transparency is “an essential foundation for rule-governed and intersubjectively valid social science research” (Moravcsik, 2014, p. 49). This study’s transparency was ensured by pursuing the highest quality of research. The research’s quality was maintained by providing scholars access to the data collected, used methodology, processes, theories, and all related materials, with the goal of producing strong and trustworthy results that will contribute to the study of students’ engagement and Game Based Learning.

**Flow Theory**

Anfara and Mertz (2006) defined theoretical frameworks as “an empirical or quasi-empirical theory of social or psychological process at a variety of levels (e.g. grand, mid-range,
and explanatory) that can be applied to the understanding of phenomena” (p. xxvii). Theories of motivation and engagement are most applicable to this study. Among the different motivational and engagement constructs, intrinsic motivation principles align best with this research.

Motivation is intrinsic when subjects display an innate propensity, interest, and pleasure towards completing a certain kind of activity (Sansone & Harackiewicz, 2000). Games are a well-known source of intrinsic motivation and engagement that if harnessed correctly can be utilized as a significant learning tool (Aljezawi & Albashtawy, 2015; A. Huang & Levinson, 2012; M. Jong, J. Shang, F. L. Lee, et al., 2008; Mayo, 2009; Neef et al., 2011).

The apparent reciprocal relationship between engagement and motivation (Reeve & Lee, 2014; Saeed & Zyngier, 2012) should be considered when studying gamers’ experiences. One of the theories that consider this relationship and is appropriate for this study is flow. The concept of “flow”, also known as “optimal experience”, is a mental state that occurs during certain activities where the level of challenge and the subject’s skill level are at their highest (Csikszentmihalyi, 1975). Flow is regarded as a “strong conception of intrinsic motivation” (Moneta & Csikszentmihalyi, 1996, p. 279) that can be used as a lens to examine students’ gaming experiences. By utilizing flow as the theoretical framework of this study and guide us towards increasing engagement in the classroom.

**Flow’s Definition and Context**

Flow was introduced by Csikszentmihalyi (1975) and it is used to describe a dynamic state of enjoyment experienced by some people when undergoing activities that meet a specific criteria. In a flow state, subjects notice how “action follows upon action according to an internal logic that seems to need no conscious intervention by the actor. He experiences it as a unified flowing from one moment to the next” (Csikszentmihalyi, 1975, p. 36).
Flow is experienced in certain activities where clear goals are defined and when “tasks are within one’s ability to perform” (Csikszentmihalyi, 1975, p. 39). Csikszentmihalyi also described flow as an “optimal experience” that offers just the right balance between challenge and skills. This balance is of crucial importance for flow to occur and is a key tenet of the theory.

Moments of flow fall into a limited area or “zone” of experience (see Figure G1). Csikszentmihalyi describes this flow zone stating,

If challenges are too high, one gets frustrated, then worried, and eventually anxious. If challenges are too low relative to one's skills, one gets relaxed, then bored. If both challenges and skills are perceived to be low, one gets to feel apathetic. But when high challenges are matched with high skills, then the deep involvement that sets flow apart from ordinary life is likely to occur. (Csikszentmihalyi, 1997, p. 30).

In other words, the original flow model presents a series of fluctuating states that subjects can experience during an activity depending on their level of challenge and skill. These states conform the foundation of what has been referred to as the “four channels model of flow” and fall into four main categories: apathy, boredom, anxiety, and flow. In these optimal flow experiences, goals are clearly defined while feedback is immediately provided. Although flow is closely related to enjoyable activities, it goes beyond feelings of well-being and includes characteristics that can be associated with deep immersion, merging of action and awareness, deep focus and attention, lack of self-consciousness, and “not requiring goals or rewards external to itself” (Csikszentmihalyi, 1975, p. 47).

People experiencing flow are completely immersed in the task at hand and their attention is focused on the goal in such a way that their awareness is merged with action while their sense
of self is lost in an environment where “there is no need to negotiate rules” (Csikszentmihalyi, 1975, p. 73). A flow state produces in subjects a sense of control without causing worry about losing control, while simultaneously being intrinsically motivating and requiring a deep sense of attention that can distort users’ sense of time and location. Flow’s relationship with the study of optimal experiences is considered to be part of the Positive Psychology field in charge of the “scientific study of ordinary human strengths and virtues” (Sheldon & King, 2001, p. 216) and their valued subjective experiences of “well-being, contentment, and satisfaction (in the past); hope and optimism (for the future); and flow and happiness (in the present)” (Seligman & Csikszentmihalyi, 2000, p. 5).

Although Csikszentmihalyi’s concepts may have been influenced by Abraham Maslow’s (1962) studies on “peak” experiences, flow experiences are unique in that they are more frequently experienced and are far from being rare or extreme (Rodríguez Sánchez, 2009). The original concept of flow was later revised by Fausto Massimini and Carli (1988) who included four additional states to the model: relaxation, arousal, worry, and control (see Figure G2). This expanded version of flow was embraced by Csikszentmihalyi (1997) and referred to as “the eight channels flow model” where moderate skills and challenges play a more important role generating additional states or feelings: moderate challenge paired with low skill generate worry, moderate challenge paired with high skill generate feelings of control, moderate skills paired with low challenge generate relaxation, and moderate skill paired with high challenge generate arousal.

Csikszentmihalyi’s original study of flow was joined by many other scholars that looked to expand and apply the theory to a diverse set of fields. For example, Csikszentmihalyi and Lefevre (1989) researched the presence of flow in a work environment and compared it to its
occurrence in leisure activities looking to answer whether “the quality of experience was more influenced by whether a person was at work or at leisure or more influenced by whether a person was in flow” (p. 815). Similarly, F. Massimini, Csikszentmihalyi, and Carli (1987) aimed to confirm the importance of challenge and skill in flow. They found that the ratio between challenge and skill was a fundamental predictor of optimal experiences, boredom, and anxiety.

**Flow’s Connections with Games and Learning**

Flow theory is considered innately related to games and learning. In fact, Csikszentmihalyi was interested in the study of happiness since his childhood in wartime Europe, where he spent some time in a prison camp and developed a fondness for chess. Chess helped him to overcome the difficult conditions of his imprisonment and became one of his first experiences with flow (Sobel, 1995).

The inherent link between games and the flow state was later emphasized by Csikszentmihalyi (1975) when he stated that games are “obvious flow activities” while “play is the flow experience par excellence” (pp. 36-37). Since not all games are made equal and a game one person finds fun may be disliked by another person, Csikszentmihalyi clarified that not all games or activities guarantee flow because experiences are individual, personalized, and subjective. The connection between flow and games is not only evident but also reflected in many recent studies that have utilized flow as a lens to frame their research on game design, virtual worlds, and learning (Chen, 2007; Cooper, 2009; Y.-C. Huang, Backman, & Backman, 2010; Kiili, de Freitas, Arnab, & Lainema, 2012; Kiili, Lainema, de Freitas, & Arnab, 2014; van Schaik, Martin, & Vallance, 2012; Winberg & Hedman, 2008).

Csikszentmihalyi emphasized the close relationship between flow and learning, stating that flow “acts as a magnet for learning” (Csikszentmihalyi, 1997, p. 33). He explained how, in
the “arousal” state, the person can return to flow naturally by acquiring new skills while learning is also incentivized when a subject increases the level of challenge in an activity. Following this line of reasoning, learning can be considered an integral part of flow since the conditions and factors that lead to it require subjects to self-improve in order to match their skills to the emerging challenges. This cyclical process is very similar to the one utilized in many games and frequently used in GBL.

Flow’s Methods and Relevancy to this Study

Although flow subjective experiences may be perceived to be naturally aligned to qualitative methods, a large portion of flow studies focus on quantitative methods that measure the occurrence of flow in different circumstances (Kefor, 2015). When trying to measure the frequency of flow experiences, one of the most commonly used tools in quantitative studies is the Experiential Sampling Method (ESM) where respondents are sent electronic signals during an extended period of time in order to instruct them to self-report their flow experiences as they are happening (Csikszentmihalyi & Larson, 1987; Csikszentmihalyi, Larson, & Prescott, 1977). ESM has become useful and important in certain quantitative studies, but it has a number of challenges and disadvantages that can limit its application. For example, since subjects are normally asked to stop their activities to fill out reports on their experiences, this method can become intrusive and even disruptive (Zirkel, Garcia, & Murphy, 2015), causing the interruption of deep flow, something that would “destroy the phenomenon” (Nakamura & Csikszentmihalyi, 2014, p. 101). In addition, due to the high frequency of the signals sent, ESM studies can expose participants to time consuming and extended periods of study requiring a “high level of commitment from the participants” (p. 7) and, in turn, increasing the frequency of drop-outs from a study.
While ESM can be very useful in quantitative studies that aim to measure the frequency and intensity of flow experiences, other methods are needed to understand flow and its essence. For example, in-depth interviews can be used to provide rich insights on past experiences and are indispensable especially when direct observation of a studied phenomenon, behavior, or condition is not possible (Merriam, 1991). Flow questionnaires can be used in order to propose “definitions of flow and asks respondents to recognize them, describe the situations and activities in which they experience flow, and rate their subjective experience when they are engaged in flow-conducive activities” (Moneta, 2012, pp. 24-25). These methods more closely align with the nature of this study, as they are expected to provide a deeper view of students’ flow experiences with games. The subjectivity and individual nature of flow experiences in games together with the oversaturated use of ESM as a primary data collecting tool in flow studies (Kefor, 2015), calls for more qualitative approaches to studying flow theory that can offer different perspectives and insights on the gaming phenomena and its academic implications.

Some critics have labeled flow as a western psychic phenomenon (Sun, 1987) that borders with the ethereal or even the mystical. These claims are based on the fact that whether one is in flow or not “depends entirely on one's perception of what the challenges and skills are” (Csikszentmihalyi, 1975, p. 51). Although flow experiences are obviously subjective and may vary from culture to culture (Csikszentmihalyi, 1975), flow’s dynamic process remains unchanged regardless of the person experiencing it.

Flow has consolidated itself in the field of Positive Psychology as an important theory. Although the importance of the relationship between challenges and skills have been scrutinized by some authors (Løvoll & Vittersø, 2014), substantiated negative critiques are sparse and difficult to find. Flow theory’s tenets and details are not only critical in trying to gain deeper
insight on gamers’ experiences, but also in understanding the different factors that can make games memorable, immersive, and especially “engaging.” Understanding how students reach a flow state in different gaming activities is of significant interest in the quest to find new methods to increase engagement and success in academic activities.

Conclusions

Students’ experiences in the classroom are often relegated to traditional and monotone lecturing methods (Khan, 2012). Considering that engagement is determinant for students’ academic success (Coates, 2005, 2010; Floyd et al., 2009; Jagannathan & Blair, 2013; Krause & Coates, 2008; Trowler, 2010), orthodox teacher-centric lectures that fail to engage students are in need of a serious revision. While traditional lectures occupy an important space in the classroom, novel methodologies are needed in order to switch from a teacher-centric to a more student-centered classroom where students are constantly engaged in activities that are conducive for learning. This study aimed to contribute to that goal by exploring the gaming experiences of college students in order to gain insights into the essence of those experiences. Understanding more about students’ gaming experiences help us maximize academic engagement and provided valuable information to reach a more common set of practices that could increase teaching effectiveness, the effectiveness of games as teaching and learning tools, and facilitate GBL adoption.
Chapter 2: Literature Review

The goal of increasing our students’ academic performance remains a challenge at all levels of our educational system. While it is common to associate academic success with grades received from standardize evaluations (Coates, 2005), it can be argued that the quality of education would be more accurately measured by using a combination of factors that prominently include the degree of students’ engagement in their academic activities (Coates, 2005; Floyd et al., 2009; Jagannathan & Blair, 2013; Krause & Coates, 2008; Tews et al., 2015). Although engagement has been defined in different ways, when seen from an academic perspective in North America the term has historically been associated with students’ “involvement” in their education (Trowler, 2010). Trowler comments on how students’ feelings of engagement must be connected to actions and vice versa, while he reiterates the view that sees engagement as a multidimensional mixture of behavioral, emotional, and cognitive elements (Fredricks, Blumenfeld, & Paris, 2004; Kong, Wong, & Lam, 2003; Rich, Lepine, & Crawford, 2010). Within these three dimensions, highly engaged students exhibit an increase in a series of specific interrelated characteristics like attention, sense of belonging and socialization, investment in learning, motivation, understanding, deep learning, and enjoyment.

It may be relevant at this point to briefly reflect on some of these characteristics in order to examine their importance and relationship with students’ engagement and success. Motivation, for example, is a “key factor mentioned regularly in the literature for students to reach academic success” (Jagannathan & Blair, 2013, p. 3). It is important for teachers to consider both intrinsic and extrinsic motivation factors in order to design new teaching strategies that may incentivize students’ motivation and engagement.

The relationship between engagement and motivation has been identified and studied by
different scholars. A longitudinal research study on high school students by Reeve and Lee (2014) revealed that high levels of engagement facilitates and increases students’ motivation while Saeed and Zyngier (2012) affirmed that motivation in students helps to increase their levels of engagement. These conclusions support the notion that motivation and engagement are reciprocally related and may go hand-in-hand.

Deeper learning is another important characteristic displayed by fully engaged students. It refers to understanding concepts at a level that goes beyond simple memorization or information-reproducing (Biggs, 1987; Marton & Säljö, 1976). Students that are learning deeply display a series of higher order thinking skills such as analysis, judgment, and synthesis that can transfer to a variety of situations and are promoted through different strategies that directly apply acquired knowledge (Floyd et al., 2009). Deeper learning have been shown to be related to students’ enjoyment in class and their learning attitudes, something that could be facilitated by creating positive learning environments (Şirin İlkörücü, Muhlis, & Nuran, 2012).

Enjoyment, or more commonly referred to as “fun”, is of special relevance to this study and an important characteristic associated with students’ engagement. Although empirical research related to fun in the classroom seems to be limited, “a number of educators and researchers alike believe that incorporating fun in the college classroom is a key strategy to engage students in the learning experience” (Tews et al., 2015, p. 16). The study conducted by Tews et al. revealed how certain aspects of fun have a positive impact on students’ engagement and reinforced its importance in the college classroom. The authors argue that fun in the classroom may increase students’ interest, mental engagement, and group cohesion while facilitating course accessibility and providing a safer learning environment where students’ mistakes are more acceptable. Students that enjoy academic activities will be more prone to be
actively involved in their learning and, therefore, may more easily and frequently achieve academic success.

Students’ attention is also related to academic success, is of vital importance for effective learning, and can be affected by several factors. Students that display higher levels of attention not only understand better concepts, but also tend to have higher grades (Krumrei-mancuso, Newton, Kim, & Wilcox, 2013). Although there seems to be a lack of recent studies that examine the relationship between healthy students’ attention and engagement, it is reasonable to infer that students who are highly engaged in their learning will also display higher levels of attention in class.

Maintaining students’ attention for long periods of time is a challenge. Several studies indicate the sharp decline in students’ attention after only 10 to 15 minutes of lecture time (Almarode & Almarode, 2008; Svinicki & McKeachie, 2006; Wankat, 2002; Wilson & Korn, 2007). Since the duration of students’ attention in the classroom greatly depends on the used teaching methodology, the selected methodology should consider all the different aspects of the learning process.

One final characteristic is the socially experiential aspect of students’ learning and engagement. As previously mentioned, engagement is a broad phenomenon that includes a combination of intermixing aspects. From an experiential constructivism approach, learning is generally seen as a conflict-filled cyclical process where “new knowledge and skills are achieved through confrontation among concrete experience, reflective observation, abstract conceptualization, and subsequent active experimentation” (Fenwick, 2001, p. 18). While engagement can be experienced in relative isolation, it is also possible to design learning activities in order to engage students in socialization and teamwork experiences that would help
students construct their learning while acquiring important social skills.

All these different characteristics have an impact on students’ learning, are interconnected, and can be influenced directly by students’ engagement. In consequence, students’ engagement can be seen as “an antidote” to many academic problems (Fredricks et al., 2004) and eventually become an important indicator of educational productivity (Coates, 2005). Educational institutions should be concerned about increasing students’ engagement (Jagannathan & Blair, 2013; Trowler, 2010) and start by finding novel methodologies and strategies for teaching and learning that would incentivize all its associated benefits.

**Student-Centered Vs. Teacher-Centered Teaching**

Although students’ engagement is a determinant for their academic success (Coates, 2005, 2010; Floyd et al., 2009; Jagannathan & Blair, 2013; Krause & Coates, 2008; Trowler, 2010), orthodox teacher-centric lectures that fail to address many of our students’ needs still remain the most commonly used teaching method in higher education (Khan, 2012). While in a traditional teacher-centric classroom students’ place all their attention and focus on the teacher who transmits information in one direction mostly through monologue lectures, in a student-centered approach the teacher’s role is to facilitate and guide the students’ learning experience by placing them at the center of their own learning process (Crumly, 2014; Granger et al., 2012; Moura & Van Hattum-Janssen, 2011). The teacher-centric classroom is a quiet place where the teacher speaks and the students listen with very little interaction or deviation from the teacher’s plan (Crumly, 2014). With the exponential increase and availability of technological tools and the coming of new generations of students, traditional teaching lectures as a sole educational method seem to be falling behind with the times. M. Jong, J. Shang, F.-L. Lee, and J. Lee (2008) argued about the need to promote change in educational methods and switch from a didactic
model to a constructivism one where learning by doing, instead of learning by solely using lectures, is emphasized. Crumly goes further, emphasizing how student-centered classrooms are places where a variety of teaching methods are used, instructors have become facilitators, classroom activities are based on students’ interests and active participation, and where students learn “how to learn”.

There seems to be a clear agreement on the benefits of student-centered learning, especially when compared to traditional lectures (Granger et al., 2012; Middendorf & Kalish, 1996; Moura & Van Hattum-Janssen, 2011; Robinson & Kakela, 2006; Sahin & Abichandani, 2013). Simultaneously, one of the most prominent characteristics of this approach is the ability to instill “strong engagement of students in their own learning process” (Moura & Van Hattum-Janssen, 2011, p. 426), something that should be carefully considered when deciding to implement new teaching and learning methods. Student-centered learning is closely related to “active-learning” since students in this approach participate in activities and experiences that actively engage them in their learning (Moura & Van Hattum-Janssen, 2011) and require a much wider set of teaching methods than the ones provided in a teacher-centered approach. GBL is a student-centered methodology that when applied correctly, can provide engaging learning experiences. Effectively designed games are intrinsically associated with feelings of enjoyment or fun and, therefore, are ideal engagement tools that have distinct advantages in comparison to more teacher-centric methods.

For example, Mayo (2009) suggested that games could outperform traditional lectures’ learning effectiveness by a margin of 7 to 40% while Neef et al. (2011) conducted an experiment with different groups of students being subjected to either games or lectures as educational tools and found that players had considerably superior performance equivalent to an additional grade.
letter. Rosser et al. (2007) found a 24% speed increase, a 32% reduction of errors, and a 26% better overall performance in students using commercially off-the-shelf computer game exercises compared to non-player participants in a medical endoscopic class, showing a clear correlation between video game skills and laparoscopic surgical proficiency. Connolly, Boyle, MacArthur, Hainey, and Boyle (2012) reviewed 129 papers reporting empirical confirmation of the positive impacts and outcomes of computer games, but reiterated the need for further quantitative studies on the subject.

Conveying subjects in an active-learning style is one of the key aspects of effective academic games. A. Huang and Levinson (2012) researched the effects of using board games in two transportation courses at the University of Minnesota and reported that most students expressed their preference for these methods, and their agreement on their positive qualities for teaching and learning open-ended subjects. Furthermore, Pivec and Kearney (2007) surveyed students taking a role-playing class where teams worked to create a fictional game design company and found that 66% of students considered educational games as “highly motivational”, while 60% suggested a preference for using games to learn (p.421).

Mayo (2007) reflected on the quantitative evidence regarding the effectiveness of games in academia and used an assessment tool to evaluate learning in 62 physics classes. The assessment revealed a higher degree of learning obtained by using interactive engaging methods in contrast to traditional lectures. Mayo went further by concluding there is evidence showing lectures to be “ill-suited to learning” (p.32).

**The Current State of Game Based Learning in Education**

While the importance of students’ engagement seems to be clear, it can be argued that its level and the quality of students’ learning experiences can be directly influenced by the teaching
methods used in class. Although lectures still play an important role in education, it is necessary to alternate them with more engaging and novel methods that can regain students’ attention and interest (Aljezawi & Albashtawy, 2015; Middendorf & Kalish, 1996; Young et al., 2009). Students learn better when they are actively interested and can relate to the information presented (Robinson & Kakela, 2006), while lectures that fail to alternate with more interactive methods tend to bore students and disengage them from their learning (Astrid & Stephen, 2011; Martelle, 2014; Rockwood, Patterson, & Hogan, 2005). Based on the literature, it may seem clear that applying a more student-centered approach to education and finding novel teaching methods is crucial in our current decaying educational system. GBL is a student-centered approach that has recently gained attention and is the focus of this research.

While several studies seem to indicate an increased interest and utilization of games as educational tools in the classroom (Leonard A Annetta & Holmes, 2006; M. S. Jong, J. Shang, F.-L. Lee, & J. H. Lee, 2008; J. Robertson, 2012; Schaffhauser, 2013), the subject of using games as educational tools has also caught the attention of the U.S. government and President Obama, who both strongly support their use in education. In 2010, President Obama announced the launch of the National STEM Video Game Challenge (http://stemchallenge.org/) that aims to motivate interest in science, technology, engineering, and math (STEM) learning by tapping into students’ natural passion for playing and making video games. In a 2013 speech made by President Obama, he stated,

Given how pervasive computers and the Internet is now and how integral it is in our economy and how fascinated kids are with it, I want to make sure that they know how to actually produce stuff using computers and not simply consume stuff. (The White House, 2013).
Initiatives like this have supported the idea that games can be effective educational tools and recognized their potential to greatly increase students’ engagement, attention span, and other related issues that can significantly influence students’ academic success (Aljezawi & Albashtawy, 2015; Claman, 2015; Entertainment Software Association, 2014; A. Huang & Levinson, 2012; M. Jong, J. Shang, F. L. Lee, et al., 2008; Sanchez Martin et al., 2014; Simões et al., 2013; Tews et al., 2015).

When incorporating games in the classroom, educators have the choice to include a wide variety of options each with specific advantages, disadvantages, and characteristics. In order to facilitate and organize our discussion, the selected literature for this section was divided into two categories of game implementations: electronic, and non-electronic/mixed.

**Electronic Implementations.** This category of games seems to be the most commonly mentioned in the literature and include self-created and off-the-shelf commercial video games, simulators, 3D virtual worlds, and other type of electronic entertainment as part of the educational experience. Very popular off-the-shelf commercial games such as “SimCity” (http://www.simcity.com/) and “Civilization” (https://www.civilization.com/) have been explored as learning tools in some classrooms. SimCity is a simulation computer game, where players take on the role of a virtual city’s mayor to deal with issues such as budget, traffic, and crime in order to create and develop cities and that has shown to be effective in enhancing computer literacy, geographical knowledge, and critical skills (Adams, 1998). In the Civilization game series, players assume the role of a civilization leader in order to compete for scientific, military, political, and cultural victories, while collaborating with other players through a series of military and diplomatic channels available in the game (M. Jong, J. Shang, F.-L. Lee, et al., 2008). Authors like Squire (2005), Pagnotti and Russell (2012) reflected on the use of
Civilization as an entertaining learning tool obtaining very positive results in terms of teaching world history more effectively. A. Lenhart et al. (2008) went further by providing teachers with a framework to integrate Civilization into the classroom setting and remarked how it could be an excellent motivational tool to encourage high-order thinking.

Simulations and virtual worlds were another important type of electronic platform frequently found in literature. Virtual worlds, also referred to as multi-user virtual environments (MUVE), are complex computer generated 3D locations where users can interact, explore, manipulate virtual objects, and experience a strong sense of “being there” (Warburton, 2009). Professors of different areas and in varied subjects are constructing virtual worlds to conduct lectures, share class materials, create games, and immerse students in a different learning environment with the aim of improving students’ engagement (Atul, 2012; Beltran Sierra, Gutierrez, & Garzon-Castro, 2012; Esteves, Fonseca, Morgado, & Martins, 2011; Ryoo et al., 2011).

An interesting example of applying virtual worlds to create interactive educational games was the project undertaken by Ryoo et al. (2011). The goal of this project was to teach cybersecurity concepts to students in an interactive way using the freely available “OpenSim” (www.opensim.com) virtual world software as a GBL platform. The game started by dividing students in two teams; one team in charge of preventing and repelling simulated cyber-attacks while the other in charge of producing them. Using a series of activities that include assembling a TCP/IP (Transport Control Protocol/Internet Protocol) packet on a virtual assembly board, scanning for open ports, closing them, applying simulated patches, and answering related questions, members within each team collaborate to fulfill their designated goal while competing against the other team using a points reward system.
Although Ryoo et al. (2011) discussed a project still in its development phase, the intricacies and details of its design can be instrumental for future studies on GBL using virtual worlds. This project exemplifies the mixing of collaboration with competition using games in a virtual learning environment. In this same context, it was found that although individual implementations of virtual worlds by teachers and researchers are the most abundant cases in academia, some large and wide-scale adoptions are starting to emerge.

The University of Texas has adopted the virtual world platform “Second Life” (www.secondlife.com) in all its 16 campuses to create a wide scale virtual learning community (Eaton, Guerra, Corliss, & Jarmon, 2011). With the approval of the Internal Review Board (IRB), faculty is encouraged to use the system not only as learning and teaching tools for students, but also as sharing and collaborative platforms for research. Similarly, the Atlanta school district, comprising of 35 schools and 38,000 students, has recently decided to offer a virtual world environment to every classroom teacher (“Forsyth County Schools has selected Dreamland Metaverse,” 2012). North Carolina State University’s College of Education, a virtual learning environment called the “Wolf Den” (Annetta, 2008) was used to teach online courses allowing students to create role-playing games. Finally, “Quest Atlantis” (http://www.questatlantis.org/), a National Science Foundation funded project developed by Indiana University, is another interesting example of a virtual environment where students have to complete different quests that require them to participate in real-world, socially and academically meaningful activities (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005).

While virtual worlds offer a canvas for users to create their own content, simulations, and games (Kalning, 2007), massively multiplayer online games (MMOGs) such as “World of Warcraft” (https://worldofwarcraft.com), provide a pre-set of objectives, rules, and quests for
players to follow. The scripted material on some MMOGs may increase the difficulty of their adaptation to satisfy academic objectives. Nevertheless, the immense popularity of some of these games have driven many instructors to use them successfully in several academic scenarios such as in the social studies (Curry, 2010; Dickey, 2011; Pirius & Creel, 2010). For example, Pirius and Creel (2010) implemented World of Warcraft in their class to help students’ learn concepts related to identity, culture, gender, citizenship, and language. By using the game’s immersive features, students were asked to play while observing other players’ behaviors, and reflecting on their meaning in relation to class objectives. Even though some of these games may be more difficult to relate and use in class, by using the positive reactions and feelings of students towards them, it is possible to generate interest in academic subjects and increase engagement.

Console games such as the Nintendo Wii, Nintendo DS, Sony PlayStation, and Xbox are other options for teachers that are looking to include games as part of their curriculum. These powerful gaming stations could bring particular benefits for teaching and learning. A study conducted in Scotland that included 634 primary school students from 32 schools showed that students that played a specific console “brain” game for 20 minutes each day displayed significant improvements in computation accuracy, speed of processing, and attitude to school (D. Robertson & Miller, 2009). Maldonado (2010) commented on how the Nintendo Wii console is surging as a means for teaching different academic subjects in K-12 classrooms and described its value as a way to increase engagement, motivation, social collaboration, teamwork, physical activity, and learning.

Research specifically directed at the use of console games in the classroom is very limited (Groff, Howells, & Cranmer, 2012) and, therefore, examples of their use in academia
were rare in the literature. The fact that game consoles are not commonly available in schools and that their function is restricted to games may partially explain their apparent limited usage in classrooms. The literature found on this specific topic focused mainly on primary and middle education, leaving an important gap for future studies at higher levels.

**Non-Electronic/Mixed Implementations.** This category of games seems to be more uncommonly mentioned in literature. They consist on incorporating self-created and off-the-shelf commercial board games, adaptations of popular television games, card games, and other type of non-electronic entertainment that can be mixed with technological elements as part of the educational experience. Although these types of games are much easier to implement in the classroom due to their lower requirements and accessibility of the elements for their implementation, they still require preparation and careful design for their effective adaptation in the classroom. For example, the adaptation of television game shows in the classroom have been used by some instructors in order to convey important academic topics. Horsley (2010) commented on the use of the game “Who Wants to Be a Nurse”, a “combination of two popular television game shows, Family Feud and Who Wants to Be a Millionaire” (p.363) as an additional tool for actively engaging students and creating an entertaining learning environment. When using a version of the popular game “Jeopardy!” to convey academic topics in a nursing class, Aljezawi and Albashtawy (2015) found improved performance in participating students’ post-intervention and retention tests results compared to those that attended a standard lecture.

Instructors that are looking to implement games in the classroom can also use cards and board games as part of their GBL strategy. Although these types of games were not very common in literature, something that may indicate a possible lack of recent interest in their study as GBL tools, games like “Monopoly” have been successfully used as tools to teach different
topics like economics and accounting (Mastilak, 2012; Shanklin & Ehlen, 2007; Tanner & Lindquist, 1998). Some educators have created customized card games in order to facilitate teaching and learning in specific topics. For example, “Top Careers in Science” is a game of 30 cards containing detailed information about careers and aimed to spark the interest of middle school students to investigate further into various career options (Smith & Munro, 2009).

Many teachers are finding creative ways to combine easily available technological elements such as digital cameras and mobile phones with “treasure hunts” in order to incentivize students to participate in more engaging and active activities that will convey educational concepts (Bragg, 2014; Bridgeman, Rutledge, Todd, & Connor, 2011; Hance, 2014). In treasure hunts, students are normally asked to look for clues located in specific locations that when placed together reveal larger pieces of a puzzle or concept. Treasure hunts can integrate the concepts of active learning and GBL to “invite students out of the classroom into a world of discovery” (Hance, 2014, p. 9). They can encourage teamwork inside and outside the classroom, familiarize students with their environment, increase students’ socialization skills, offer interesting challenges, promote problem solving, and convey important academic topics all while providing an entertainment form of teaching (Bridgeman et al., 2011).

In mixed GBL implementations, technological elements can be used as enhancer tools rather than a focal component in order to facilitate the learning experience. Hance (2014) showed a perfect example of a mixed implementation by conducting a treasure hunt in a class that instructed students to use their mobile phone cameras in order to capture quick response (QR) codes located at 10 outside school stations and conveying class related information through the Internet in the form of rewards or “treasures” once codes were successfully located and scanned. Incorporating the Internet as a research and discovery tool is another important
technological add-on to treasure hunts. Using audio-visual online resources, students can find information to help them solve specific problems or “quests” related to the class. This process is very similar to traditional “web quests” first introduced by Bernie Dodge and Tom March in 1995 (Göktepe, 2014). Although web quests are not generally categorized as games, their characteristics make them a “very good tool for inserting the elements of games into education and making education interesting and motivated” (Shevtsova & Ifenthaler, 2008, p. 518). When reviewing the literature on GBL, several interesting case studies that utilized web quests in academic settings were found (Dodge, 1995; Göktepe, 2014; Levitt & Piro, 2014; Peterson & Koeck, 2001) indicating their popularity in K-12 education, relevance as GBL tools, and usage as “authentic learning experiences” (Levitt & Piro, 2014, p. 54).

**Game Based Learning Challenges**

Effectively incorporating games in the classroom as teaching and learning tools has many obstacles consistently mentioned in the literature. Remaining aware of these challenges is important in order to minimize, correct, and prevent problems that may arise from their implementation. For example, Baek (2008) identified many significant factors that inhibited teachers’ game use in a classroom setting including “inflexibility of the curriculum” and “negative effects of gaming” as one the strongest, and “limited budgets” as one of the weakest. Baek remarked the difficulty of many teachers to locate useful educational games and found differences in the amount of encountered obstacles based on teachers’ experiences. De Grove, Bourgonjon, and Van Looy (2012) also had similar observations and noticed that more experienced teachers on average consider electronic games to be more suited to use in education as opposed to teachers with less experience. This pattern shows how experience may play an important role in teachers’ views and the implementation of GBL initiatives.
The literature reviewed by De Grove et al. (2012) reiterated some of the previously mentioned obstacles. The authors expressed their skepticism regarding games in the classroom and their belief that games could be an obstacle rather than a facilitator in their teaching. Their study showed that in addition to “teachers’ experience”, “relatedness of the curriculum” was also found to play a vital role in the integration of games in the classroom.

The possible harmful effects of specific types of video games also constitute an important and well-documented obstacle and inhibiting factor to consider when deciding to implement these methods. In contrast, the study conducted by Saleem, Anderson, and Gentile (2012) concluded that participants who played “neutral” or “pro-social” games showed a significant increase of positive effects, including a reduction in aggression. They also confirmed the increase of negative effects on players exposed to highly violent games and reported “a significant interaction between game type and trait aggression” (p.267).

When comparing different kinds of games, electronic video games present considerable additional challenges in terms of technical complexities, requirements, risks, and skills needed for their adaptation and implementation (De Grove et al., 2012). Most modern off-the-shelf video games require the use of relatively modern equipment with strong Internet connections and individual licenses, something that could bring considerable costs for their adaptation. Furthermore, a significant amount of technical skills may be necessary in order to install, adapt, supervise, and maintain an electronic game project in the classroom. In the case of customized games, the requirements may go even further, posing an additional layer of complexity that may include knowledge of game design, content creation, system maintenance, overview, and evaluation. Although these complexities may be alleviated by using different strategies that include the use of non-electronic and mixed GBL implementations, their adoption impose
considerably extra work for faculty who may be used to traditional lectures and naturally resist change.

In order for teachers to adopt GBL strategies effectively it is important to select or design games that would meet a series of specific requirements and considerations. Kebritchi (2010) found that games used in academia should have a broad set of requirements that work in unison. Some of these included, empirical based indications of games’ effectiveness, appropriate content, consideration for both male and female students, enough support, a clear problem-solving instructional strategy, time and technology compatibility, and an alignment of the game learning objective with state and national standards (pp. 260-263).

Acquiring support of faculty members is a fundamental challenge when trying to incorporate any novel teaching method. In the case of GBL, teachers’ involvement is even more important since it is imperative that games are implemented correctly and with sufficient planning. A badly designed or implemented classroom game can have an opposite desired effect in many areas and a higher chance to make faculty feel uncomfortable or lose control of their classrooms (Billings, 2009). Considering that “insufficient training, time, and incentives are among the most commonly cited barriers for faculty change” (Brownell & Tanner, 2012), effective GBL initiatives must address all these issues beforehand if they are to be more widely adopted.

In spite of these difficulties, it is evident that current generations of students are deeply exposed and involved in using new technological tools. The ways students communicate and interact have been changing with the expansion of the Internet and the synergy between interactive audio, video, and text (Margaryan, Littlejohn, & Vojt, 2011). The popularity of intelligent mobile phones and tablets, together with their increasing affordability is expanding
the reach of technology allowing these new methods and tools to become pervasive. It is becoming apparent that new generation of students expect, and possibly even require, new teaching methods that incorporate novel technologies and tools in order to remain engaged and increase the effectiveness of teaching and learning.

**Pedagogical Considerations**

Although GBL seems to be gaining attention in academia, there seems to be a lack of a well-defined, structured, and universal set of pedagogical best practices for its implementation. This gap seems to be wider in higher education where fewer studies have been found on the subject. Introducing game activities in the classroom may not be a simple endeavor and is something that should be carefully planned in order to take into consideration not only the entertainment aspects of gaming activities, but also their educational value, risk, and connection to academic objectives.

Although some studies provide recommendations for implementing GBL (Alaswad & Nadolny, 2015; Aljezawi & Albashtawy, 2015; Billings, 2009; Girvan & Savage, 2010; Groff et al., 2012; Peterson & Koeck, 2001; Pirius & Creel, 2010), none seem to indicate a specific game or design plan that could be effectively applied in a broad set of topics and circumstances. Nevertheless, these studies have produced valuable results that are important to consider and could be the foundation of further research. For example, Alaswad and Nadolny (2015) reflected on how GBL “requires the instructor to consider how the best practices found in games integrate within the traditional curriculum design process” (p.390) and suggested how the GBL process contains similar core aspects of traditional instructional design where learning goals are initially defined followed by assessments and learning activities. The authors argued that “when implemented together, instructional design and GBL mirror in structure” (p.390), something that
should be taken to consideration when designing GBL activities. Their study remarked the importance of technology in the instructional design process and determined that prompt feedback, clear goals, interaction, badges and leaderboards were key game elements of an effective GBL initiative.

A Futurelab report, “Teaching with Games: Using commercial off-the-shelf computer games in formal education” (Sandford, Ulicsak, Facer, & Rudd, 2006), confirmed many of the design considerations previously mentioned and included others, like the need to allocate adequate technical resources, providing sufficient time for game activities, inclusion of reflections in lessons, and the importance of having experienced teachers with adequate teaching skills. While these considerations are relevant, a consensus in the literature seems to exist on the central role of the teacher in the GBL process, the importance of teachers’ “experience”, and the need to use educational games as supplemental tools rather than complete substitutes for teachers or traditional lectures. Billings (2009) reflected on the importance of having “the right teachers on board” (p.27) when implementing GBL initiatives while De Grove et al. (2012) pointed out teachers’ experience as a crucial factor.

In order to maximize the quality of instruction, a variety of teaching methods must be included. Mixing electronic and non-electronic games with discussions, lectures, and other more traditional methods is generally accepted as an important design consideration. Mixing collaborative and competitive elements may be the best strategy when designing games as suggested by Ryoo et al. (2011). Yet, more studies need to be reviewed on this specific subject in order to determine how collaboration and competition could be mixed in the most appropriate way.

Finally, inducing students to create their own games instead of only playing them was
another important and recurrent pedagogical consideration found in the literature. Peterson and Koeck (2001) commented that students who created their own WebQuests had a sense of pride in their work and were more involved in their own learning. Similarly, Esteves et al. (2011) reflected on how students new to programming may be more motivated to learn its basic concepts by using virtual worlds. Virtual environments are an ideal GBL platform that can allow students’ skills to be utilized immediately while transforming students into creators of their own learning experience.

Conclusions

Incorporating games in the classroom is not a simple or straightforward task. More studies are necessary not only to consolidate their possible benefits and advantages, but also to define new methodologies and specific best practices that would guide and incentive teachers towards their adoption. GBL has a diverse set of ramifications and connotations that must be explored and revealed beforehand in order to minimize risks and maximize benefits of using such methods in the classroom. Careful consideration should be placed in the selection of academic games to ensure that they meet a set of basic requirements in order to be of educational value and avoid defying their academic objectives. Game designers, teachers, and researchers must adapt current existing games and design new ones paying careful attention of include specific curriculum objectives as a focal part of the experience.

Since some possible negative effects of playing games have been reported (Baek, 2008; Eschenbrenner, Nah, & Siau, 2008; Greitemeyer, Traut-Mattausch, & Osswald, 2012; Hyun et al., 2015; Kebritchi, 2010; Rapanotti & Hall, 2011), it is important to design these activities carefully in order to minimize their risks. Choosing non-violent and pro-social games could prevent negative effects and even reduce students’ total state of hostility, aggravation, and mean
feelings (Saleem et al., 2012), while using cooperative team-play can promote feelings of cohesion and increase cooperative behavior ameliorating possible negative effects even in violent games (Greitemeyer et al., 2012). By establishing a clearly guided and effective connection between games and their target curriculum objectives, their possible weaknesses could become strengths.

Most of the reviewed literature seemed to be focused on the lower levels of education, with far less occurrences of studies targeting higher education and college classes. Although the literature reflected on some of the available games currently used in classrooms, the large variety of educational subjects, technologies available, technical complexities, academic circumstances, and pedagogical considerations greatly increase the difficulty of finding appropriate games that would be a good fit for any given case. The creation of a single game tool or methodology that could adapt to a variety of teaching subjects at different educational levels would be a significant breakthrough that could bring important benefits to students and teachers, and greatly reduce the barriers encountered when implementing GBL initiatives. Understanding how students feel about games and exploring games’ essential engaging elements will not only contribute to this goal, but also facilitate their adoption in the classroom as teaching and learning tools. This review established the importance of games as emergent teaching and learning tools and presented GBL as an important supplement to traditional teaching methods that must be considered seriously in order to increase students’ engagement.
Chapter 3: Research Methodology

This study aimed to investigate individual gaming experiences of college students and explored the essence of such experiences in order to gain insights that may help educators find better ways to increase students’ engagement, create a student-centered learning environment, and facilitate active learning. A constructivist-interpretivist research paradigm was utilized in this study. The goal of this paradigm is not to uncover a set of objective and scientific facts, or discover a single and static reality, but to understand the process of how things happen in relationship to changing environments (Merriam, 1991). The constructivist-interpretivist paradigm sees reality as an individual-based perception that cannot be clearly discovered or measured, but rather constructed in the human mind (Merriam, 1991) while taking into consideration the changing nature of the world and dynamic uniqueness of its inhabitants’ minds where reality is constructed and shaped (Ponterotto, 2005). This paradigm focuses on “the active construction of knowledge by the learner” (Siau, Nah, Mennecke, & Schiller, 2010, p. 3) and on learning through reflection on “experience”.

The Swiss clinical psychologist Jean Piaget (1966) challenged the orthodox ideas that placed knowledge outside of individuals and learning as a “process of ingesting these others’ knowledge” (Fenwick, 2001, p. 10). By observing children learning through play, he suggested that learning is a process that is actively “built” or “constructed” from the interaction with objects, the environment, individual experiences, and ideas. Using this paradigm, researchers seek to expose the meaning hidden behind a particular phenomenon or experience by engaging in an interactive “researcher-participant dialogue” aimed to stimulate deep reflection (Ponterotto, 2005). Ponterotto also remarks how this interactive dialogue is a central characteristic of constructivism, and indispensable to uncover deeper meaning.
In contrast to other paradigms, research neutrality is not the aim of constructivism. Whereas positivism emphasizes on the importance of maintaining research neutrality and detachment, constructivist-interpretivist researchers are “typically closely involved with what or who is being researched” (Merriam, 1991, p. 49). The involvement and interaction between investigator and the object of investigation, is used to further understand mental processes that construct social realities. This paradigm uses commonalities emerged among researchers and their studied subjects in order to enhance their rapport and gain further insight. It considers beliefs rather than facts to be the basis of perception (Merriam, 1991). By placing and understanding subjects’ beliefs in their appropriate context, constructivist-interpretivist theorists can better understand the meaning of actions that could be misinterpreted if not properly situated.

**Interpretative Phenomenological Analysis**

The specific research approach chosen for this study was Interpretative Phenomenological Analysis (IPA). IPA was introduced by Jonathan A. Smith (1996), a Professor of Psychology at the Birkbeck University of London (Smith, 2010), as “an alternative but complementary approach to the more established quantitative and qualitative methodologies in the psychology field” (Cassidy, Reynolds, Naylor, & De Souza, 2011, p. 264). IPA can be defined as a qualitative research method “committed to the exploration of how people make sense of their major life experiences” (Smith et al., 2009, p. 1). It is interested in exploring how each person perceives an experience, its relatedness or involvement with the world (Larkin, Watts, & Clifton, 2006), its individual attributed significance, and its meaning.

IPA is based on three fundamental philosophical underpinning: phenomenology, hermeneutics, and ideography (Dowling, 2007; Smith et al., 2009). Phenomenology was introduced by Edmund Husserl in 1900 (Moran, 2000; Pietkiewicz & Smith, 2014) and described
A radical way of doing philosophy, a practice rather than a system. Phenomenology is best understood as a radical, anti-traditional style of philosophizing, which emphasizes the attempt to get to the truth of matters, to describe phenomena, in the broadest sense as whatever appears in the manner in which it appears, that is as it manifests itself to consciousness, to the experiencer (Moran, 2000, p. 4).

Husserl’s (1970) original philosophical conception of phenomenology focused on describing how participants experienced a phenomenon in its original form without pre-reflections, interpretations, or the influence of cultural context (Dowling, 2007), with the aim of finding commonalities that could bring the researcher closer to understand the essence of experience in general terms (Creswell, 2012). Husserl aimed to gain an essential understanding of human experiences using a process called “epoch” or “bracketing” where experiences are naturally exposed without prior reflection, prejudice, or judgment (Dowling, 2007; Smith et al., 2009). Bracketing consists of putting aside all aspects outside of an experience in a similar way that brackets are used in mathematical equations (Smith et al., 2009). Subsequently, the method proceeds to a series of “reductions” intended to isolate the essential features of a phenomena (Moran, 2000) to “lead the inquirer away from the distractions and misdirection of their own assumptions and preconceptions, and back towards the essence of their experience” (Smith et al., 2009, p. 14). Several other scholars like Heidegger (1962), Merleau-Ponty (1962), and Satrel (1956) provided different perspectives to Husserl’s phenomenology by considering that people and their experiences are not isolated but immersed in specific contexts, interpretations, and relationships with the world (Moran, 2000; Smith et al., 2009).

Hermeneutics, or the theory of interpretation, is the second major philosophical
The underpinning of IPA that was originally developed in the nineteen century by Schleiermacher, Heidegger, and Gadamer (Smith et al., 2009, p. 22). IPA recognizes that each experience is unique not only due to its inherent and environmental characteristics, but also due to the particular way it is perceived and interpreted. Therefore, in an IPA study, the researcher is trying to understand or make sense of experiences while the participant is doing the same. This is what Smith et al. (2009) refer to as “double hermeneutics”.

Smith et al. (2009) remarked how IPA draws from the “hermeneutic circle” where in order to understand any given part of something, it is necessary to understand the whole and vice-versa. This is a significant characteristic of IPA studies where deductively examining individual cases is usually done in order to gain insights at a larger scale. Shinebourne (2011) summarized IPA’s interpretative process as “dynamic and iterative, engaging the concept of the hermeneutic circle in an interplay between parts and whole and between the interpreter and the object of interpretation” (p. 21).

The third major philosophical influence upon IPA is ideography or the concern with the particular. Smith et al. (2009) established how IPA focuses on the particular in the sense of examining the “details” and how experiences have “been understood from the perspective of particular people, in a particular context” (p. 29). Larkin and Thompson (2012) further explained how IPA studies need to focus on “the meaning of an experience (e.g., an event, process or relationship) to a given participant” (p. 102) in context with external factors. IPA’s goal of making sense of experiences draws from all these different conceptions of phenomenology, but differs in scope to Husserl’s (1970) definitions since it attempts to “capture particular experiences as experienced for particular people” (Smith et al., 2009, p. 16).
Scholarly Debate

Most of the scholarly debate about IPA seems to be about its relationship with phenomenology. Since phenomenology is an essential underpinning of IPA, different points of view exist in regards to its integration and usage in IPA studies. One of the most prominent detractors of IPA is Amadeo Giorgi (2010) who criticized Smith’s (1996) definition of IPA, its validity as a scientific method, and its claimed phenomenological roots. Giorgi supports the idea that psychological phenomenology has to function differently within the context of science and discredited IPA’s scientific rigor on this basis. Giorgi suggested there is a general lack of understanding about the phenomenological philosophy and its related scientific research practices, while he regarded IPA’s usage of phenomenology as a simple “content” definition insufficient for an “authentic science of phycology” (p. 5). Finally, Giorgi (2010) claimed that IPA’s flexibility and lack of strict rules, or its “individual adaptability”, can lead to a significantly less rigorous scientific analysis.

In response to these controversial claims, Smith (2010) explained how Giorgi’s (2010) critique was based upon a small and selective fraction of his work that omitted most of his published papers in which he explained the details of IPA’s philosophical underpinnings. Giorgi’s discredit of IPA as a rigorous scientific method was rebutted by Smith in his argument about how qualitative methods differ from quantitative ones in terms of prescribed procedures and in his explanation of IPA’s rules and constraints. Smith et al. (2009) suggested researchers concerned about the scientific rigor of their IPA studies should consider providing an audit trail that could be independently reviewed in order to dispel any doubts and avoid errors.

Smith (2010) also reflected on how providing guidelines to IPA researchers instead of immutable rules can produce positive results and commented on how IPA is the result of “in-
field” research rather than philosophical discourse, something that influenced its practical approach. In their notable book, Smith et al. (2009) further explained how IPA is an “articulation of a phenomenological approach” (p. 200) that attempts to move from philosophy to psychology. While Giorgi’s (2010) descriptive phenomenology approach seems to rigorously follow Husserl’s (1970) ideas, IPA does not try to operationalize any particular version of phenomenology and, therefore, the outcome from an IPA study will be different from one following Giorgi’s perspective. These differences are clearly described by the authors in the following statement,

The result of a Giorgi study is most likely to take the form of a third person narrative, a synthesized summary statement outlining the general structure for the phenomenon under question. The result of an IPA analysis usually takes the form of a more idiographic interpretative commentary, interwoven with extracts from the participants’ accounts (Smith et al., 2009, pp. 200-201).

In spite of their differences, both Giorgi (2010) and Smith (1996) try to make sense of experiences by examining their essence and attempting to operationalize phenomenology’s philosophical underpinnings.

Another related area of scholarly debate is based on different implementations and later adaptations of the original “continental” views of phenomenology in North America and other parts of the world. Crotty (as cited in Dowling, 2007) criticized researchers in the nursing field that called their studies “phenomenological” while focusing their research on experience rather than the essence of a phenomenon. Crotty’s criticism questioned the validity of what Dowling (2007) referred to as the “new” phenomenology and in some ways demeaned these new methods as mere adaptations.
The debate about what can be considered as phenomenology has led some scholars to examine different proposed research methods in search for parameters that could help frame a specific study. On this topic, Finlay (2012) remarked how “the debate about whether or not a method is in fact phenomenological pivots on the issue of criteria” (p. 8). For example, the author stated that a study claiming to be Husserlian should use phenomenological reduction and avoid pre-judgments or other external factors in their analysis. Finally, although some IPA detractors exist, as previously discussed, there seems to be a general consensus on the subjectivity of qualitative research (Finlay, 2012), something that inevitably leads to multiple interpretations, variations of methods, and philosophies.

Alignment

Exploring the essence of students’ gaming experiences requires a research methodology that not only focuses on analyzing a specific phenomenon, but also takes into consideration the subjective nature of experiences, their particular nuances, and interpretative characteristics. IPA’s wider view of phenomenology, together with its hermeneutic and ideographic underpinnings, provides a uniquely suited approach that allows for an interpretative analysis of specific individuals’ experiences. While other methodologies restrict their procedures with a myriad set of rigid and constrictive rules, IPA offers flexible tools that acknowledge the researcher’s interpretation of a phenomenon in conjunction with the interpretations of participants (Larkin & Thompson, 2012; Larkin et al., 2006; Smith et al., 2009). This will allow my unique experiences with games, teaching, and learning, to have a stronger voice, involvement, and value in the research. IPA’s characteristics perfectly align with this study’s goals while IPA’s flexibility and adapted blending of phenomenology, hermeneutics, and ideography (Dowling, 2007; Smith et al., 2009) are not only appropriate, but also needed when
looking for answers to this study’s research questions.

**Sample Design and Ethical Considerations**

Since the IPA researcher is looking to investigate a particular phenomenon or experience, subjects for this study were purposely selected in order to guarantee their affinity with the research question and meet the study’s requirements as suggested by Smith et al. (2009). A preliminary questionnaire (see Appendix B) adapted from Kefor’s (2015) research on high school arts students’ flow experiences was used to identify and select college students in the United States that self-identified as avid gamers, were 18 years old and older, and frequently experienced flow in games. These characteristics together with students’ willingness to participate were the only foreseeable commonalities between participants. No other criterion (socioeconomic status, gender, race, etc.) was considered or required.

Smith et al. recommend a small sample size to allow for in-depth accounts of individual experiences and a manageable amount of data that facilitates the emergence of themes and their interconnections. Following this recommendation, five generation Z college students participated in this study: Edward, a freshman student in his mid-twenties studying computer science; Justin, a freshman student in his late teens studying veterinary science; Evan, a freshman student in his early-twenties studying mechanical engineering; Marvin, a freshman student in his early-twenties studying civil engineering; and Megan, a sophomore student in her late-twenties studying accounting. Students belonging to generation Z were considered appropriate and representative for this study. They belong to the generation considered most technologically savvy that has being brought up in the age of personal computers and electronics (Jones, Jo, & Martin, 2007) and therefore has great exposure to all forms of electronic games. Generation Z also correspond to the generation of students currently entering college, something that is
important for this study.

The purposeful sampling method used in IPA suggests the selection of a small sample “from which the most can be learned” (Merriam, 2009, p. 77) and were detail accounts of experiences can be obtained. The sample criterion used for this study was appropriate for IPA, meet all the study’s requirements, and was found to be sufficiently representative while providing data relevant to the research question. College students represented an ideal population sample for this study and appropriate consideration was given to the ethical treatment of every participant involved.

While this study did not have any foreseeable risks, special care was taken in order to maintain all research ethical standards and best practices. Participation in this research was voluntary. Participants could choose to not participate, refuse to answer any question, and withdraw at any time.

Students were not asked to reveal the names of their colleges or universities. Participants that decided to quit did not lose any rights, benefits, or services that they would otherwise had as students. Simultaneously, the identity of participants was not known to anyone with the exception of the researcher and, potentially, authorized personnel. Only people authorized by organizations such as Northeastern University Institutional Review Board were allowed to see this information. Pseudonyms were used to increase anonymity. No reports or publications were authorized to use information that could identify participants in any way or any individuals as being of this study.

All data collected from participants including questionnaires, audio recordings, and consent documents was stored electronically in an encrypted USB thumb drive. Specifically, data was encrypted using the 128 bits Advanced Encryption Standard (AES). This drive was
stored, maintained, and safeguarded in the researcher’s residence. With the exception of consent documents, all audio recordings and data collected was destroyed upon the completion of the study. Consent documents will be destroyed immediately after 3 years following the end of the study. Although participants were not compensated for their participation, the data collected from this study will benefit academics that are looking for ways to increase students’ engagement and ultimately improve students’ academic experience.

**Data Collection and Procedures**

After receiving IRB approval, Internet ads were posted through game related online discussion boards, social media, flyers, and email (see Appendix A) in order to ask for participation in the study. Subjects were instructed to a specific web page where a preliminary electronic questionnaire (see Appendix B) was presented. This questionnaire was based on different indicators of flow and adapted from Kefor’s (2015) research on high school arts students’ flow experiences. Its purpose was to identify participants that meet the study’s requirements, were avid gamers, and frequently experienced flow in games.

After questionnaires were evaluated, qualifying potential participants were contacted by phone, following a specific script (see Appendix C). On this phone call, the project’s details and participants’ role were explained, any questions were answered, and an interview was scheduled. A location and time for the meeting was agreed, according to the participants’ choice.

At the scheduled meeting, the project’s details were explained again, any additional questions were answered, and formal signed consent was requested from each participant (see Appendix D). Following signed consent, the interview started following the specific interview protocol (see Appendix E) and schedule (see Appendix F). The total time for each participant’s interview was between 60 to 75 minutes.
Although IPA does not impose any single data collecting method, it requires rich data in terms of abundance and quality. Smith et al. (2009) recommend using methods that elicit detailed stories and accounts. Semi-structured one-to-one interviews are the method of choice while diaries (Smith, 1999), focus groups (Flowers, Knussen, & Duncan, 2001; Roose & John, 2003), observations and notes (Larkin & Griffiths, 2002), postal questionnaires (Coyle & Rafalin, 2001), and other methods have also been used but more sparingly (Smith et al., 2009).

This study used semi-structured interviews, observations, and field notes as data collecting tools. Semi-structured interviews were based on the research question and theoretical framework. They aimed to solicit rich accounts from participants about their gaming and learning flow experiences. Interview questions were designed to be open-ended and sufficiently general to allow broad and free expression of stories and ideas from participants. Several following-up questions were included, and were used when considered necessary, to incentive participants’ narrations, in-depth answers, and focus towards the main topics of this study (flow experiences in games, engagement, and learning).

A research journal, post-interview notes, and observations were also utilized as data gathering tools and aimed to complement the information obtained. The research journal focused on recording specifics about the interviews’ location, time, circumstances, and general learning outcomes while the post interview notes included the researcher’s voice and initial interpretation by placing special attention to capture students’ demeanor, attitude towards the interview process, expressions, and perceived feelings towards the subjects discussed. Data obtained from these tools was incorporated into the analysis of the results obtained using IPA hermeneutic circle and flow theory as its theoretical support. Since flow is a phenomenon that is subjective and experiential (Csikszentmihalyi, 1975, 1997; Csikszentmihalyi & Lefevre, 1989),
flow theory’s tenets and phenomenological quality are interrelatedly aligned to this study’s research question, methodology, and data-gathering methods.

**Data Analysis**

Although Smith et al. (2009) have proposed specific analytic procedures for IPA research, they remarked the lack of a single and definitive method. This lack of rigid rules leaves room for flexibility in IPA studies. IPA analysis is an inductive and iterative process characterized by different skills and strategies like “moving from the particular to the shared, and from the descriptive to the interpretative” (p. 79), together with the use of “flexible thinking, process of reduction, expansion, revision, creativity, and innovation” (p. 81).

Larkin and Thompson (2012) provide a very clear step-by-step guide on using IPA that was used in his study. Following this guide, this study started with the collection of data and its transcription. During this process, the focus was initially on a single transcript that was carefully read several times in order to produce line-by-line descriptive comments or codes that represented “an organized, detailed, plausible and transparent account of the meaning of the data” (p. 104).

In order to facilitate coding and data analysis, the qualitative research software NVivo (http://www.qsrinternational.com/) was used in this study. As Larkin and Thompson suggest, the initial codes were done without too much worry about being wrong or biased. This “free-coding” process is useful not only to lay down the researchers’ first impressions and ideas about the transcript, but also to identify their preconceptions and influence in the analysis. After this first coding iteration, the process started over, this time with an emphasis on identifying all the objects of concern (that matters to participants). This step was critical since IPA is interested in making sense of individual experiences by reflecting upon what participants consider important
The process of identifying objects of concern was guided not only by this study’s research question, but also by its theoretical framework. The coding process looked for indicators of flow that helped to identify its presence in students’ experiences. Since flow is described as a specific state that fluctuates amongst others (Csikszentmihalyi, 1975, 1997), objects of concern also included indicators of students’ transitions through these states.

After all transcripts were encoded in detail, emerging themes were identified. This was done by focusing on the objects of concern and their meaning (Larkin & Thompson, 2012). This process also involved implementing the hermeneutic circle by recalling “what was learned through the whole process of initial noting” (Smith et al., 2009, p. 91) and using that information in order to find new themes. In other words, the entire transcript was studied in order to find smaller significant chunks of information that were later used as a whole in the analysis. The emerging themes did not only capture the participant’s words and thoughts, but were also the product of a descriptive interpretative analysis.

Once coding was completed and emerging themes were individually identified, the study proceeded to look for connections between themes. In order to do this, Smith et al. (2009) suggested different techniques like Abstraction and Subsumption, where themes are sorted and super-ordinates are identified; Polarization, where themes that have opposite relationships are identified; Contextualization, where themes are sorted and identified by their contextual or narrative elements; Numeration, where themes are selected based on their frequency, and Function, where themes are examined and selected based on their positive or negative connotations.
In the final step of the analysis, all themes were connected together in order to interpret the results. This was done similarly to the previously mentioned steps, by using an iterative process that requires connecting the parts to the whole and vice-versa. Although researchers are left with a level of flexibility in this process, Smith et al. (2009) suggest that multiple levels of interpretation are possible and necessary in order to produce a rich analysis of the data that ideally resonates with the reader and provokes reflection (Cassidy et al., 2011).

Presentation of Findings

As recommended by Smith et al. (2009), this study initially presented a list of the main discovered themes. Each theme was described in relationship to each participant by providing supporting extracts from the interviews (Pietkiewicz & Smith, 2014; Smith et al., 2009). During this process, not only a descriptive account of the data was presented, but also an initial interpretation. Smith et al. (2009) describe this process by remarking the lack of a “clear-cut distinction between analysis and write-up” (p. 110) and the need to use interviewees’ own words in order to preserve their voice from the interpretative commentary of the researcher. This study also presented an introduction to the research’s participants and a brief summary of their general profiles as done by Kefor (2015). Following this narrative account, a discussion section is suggested and was presented as a way to engage in a dialogue between findings and the literature (Smith et al., 2009), present the link between identified themes and theoretical framework, include researcher’s reflections, comments, limitations, and present future ideas for research (Pietkiewicz & Smith, 2014).

Limitations

Although recruitment materials provided participants with details about the study and a level of anticipatory context that may have had some degree of influence in their responses, this
was mitigated by using semi-structured interviews designed to be open-ended, something that allowed for the emergence of additional unscripted follow-up questions. While researcher’s influence and inherent biases may have posed additional limitations in this study, notable scholars like Colaizzi (1978), Finlay (2008), and Smith et al. (2009) argue that the researcher’s voice, pre-existing beliefs, experiences, and interpretations are important and even desirable in phenomenological analysis. Participants’ reports on the scarce use of GBL in higher education not only confirm findings by other authors (Perrotta et al., 2013), but also remain an important limitation for the wider adoption of games in the classroom.

**Credibility**

Credibility is an important criteria addressed by researchers in their studies. Also referred to as internal validly, credibility can be understood as the measure of “how congruent are the findings with reality” (Merriam, 2009, p. 213). Since qualitative studies aim to gain insights on individual representations of reality, and reality is not only subjective, but also ever changing, Merriam suggests that validity “must be assess in terms other than reality itself (which can never be grasped)” (p. 213). Therefore, in order for a study to be credible, the phenomenon under scrutiny must be accurately recorded, something that can be done in different ways (Shenton, 2004).

Triangulation is a method that consists in comparing and crosschecking data from multiple sources in order to assure its validity (Merriam, 2009). Triangulation was used in this study when selecting participants from different academic disciplines and backgrounds. It was also used to cross-examine all the different sources of data obtained from participants, including audio recordings, transcriptions, and notes.

Smith et al. (2009) suggest that researchers that are concerned about the scientific rigor
and validity of their IPA studies should consider providing an audit trail that could be
independently reviewed in order to dispel any doubts and avoid errors. This study maintained a
detailed audit trail that filed all data gathering tools and research elements including notes, the
research proposal, audio tapes, interview transcripts, all data gathering protocols and scripts,
consent documents, table of themes, final reports, and any other devices. Yin (as cited in Smith
et al., 2009) remarks how doing this will allow anybody to “follow the chain of evidence that
leads from the initial documentation through to the final report” (p. 183).
Chapter 4: Findings

The interview process successfully produced findings toward answering the research question for this study: what are students’ gaming experiences in relationship to engagement and learning? Upon receiving IRB approval, preliminary questionnaires (see Appendix B) based on this study’s theoretical framework were filled by candidates leading five college students to participate: Edward, a computer science student; Jordan, a freshman student who had recently immigrated from Cuba; Evan, a mechanical engineering student; Marvin, a freshman student majoring in civil engineering; and Megan, a college student taking accounting classes. A semi-structured interview was conducted with each participant during the fall of 2017. Each interview was transcribed, analyzed, annotated, and coded.

A list of codes representing objects of concern common among interviews was identified. Duplicate codes were purged while subordinate codes were sorted (see Appendix J). Using the hermeneutic circle, patterns in codes were abstracted and analyzed to produce superordinate themes (Smith et al., 2009). Eventually, five core themes emerged from the process: (1) manifestations of flow; (2) engagement, expectations, and feelings; (3) health related issues in games; (4) social aspects of games and learning; and (5) games, learning, and the real world. Each theme will be expounded later in the chapter along with an initial interpretation of the findings as suggested by Smith et al. (2009).

Participant Profiles

**Edward.** In the fall of 2017, Edward was a full-time college student in his mid-twenties pursuing an associate degree in computer science. He expressed being undecided about his major until he discovered an affinity for computers in his college introductory courses. His hobbies included reading, movies, and video games. He commented on playing mostly role-
playing games (RPGs) using his custom-built desktop computer located on a desk of his home’s living room. He reported playing weekly and mostly during the night due to his busy school schedule.

Edward showed deep feelings toward his gaming experiences. He recounted being introduced to games by his older brother who was a very important part of his initial gaming experiences and who not only taught Edward how to play video games, but also provided him with his first computer and new games to play. His favorite game was World of Warcraft (WoW), a complex fantasy RPG game released in 2004 where players create fantasy characters with magical powers that are part of a storyline and travel across a vast virtual world completing quests (https://worldofwarcraft.com/). Edward reported playing WoW since he was fourteen years old and although he played other similar games, he expressed having a special connection and passion towards WoW.

Edward showed strong indicators of flow not only in the preliminary questionnaire, but also throughout the interview where he expressed how the feeling of being challenged was determinant for his engagement in games and in the classroom. Edward’s not only was eager to recount his story, but also seemed truly interested in GBL and its implications. He was passionate about recounting his story, something that lead to rich descriptions of his gaming and academic experiences.

Justin. At the time of the study, Justin was a college freshman who recently immigrated to the United States from Cuba. He was undecided between a career in veterinary science or biology. Justin recounted having an affinity for animals, foreign languages, history, soccer, basketball, and video games. Justin started his gaming journey when he was seven years old. He initially played console based games, but soon after switched to computers. His favorite games
were realistic first-person shooters like Player Unknown Battlegrounds (https://playbattlegrounds.com/) and Call of Duty (https://www.callofduty.com/). These multiplayer games place players in a war zone scenario with different objectives requiring shooting enemies. Justin preferred multiplayer war games based on real historical events.

For Justin, playing video games was a highly socio-cultural activity he reported to be “passionate” about and enjoyed more than any other common distraction. Justin attended classes in the mornings and worked in the afternoons until late at night, something that allowed him time to play mainly on weekends. Justin expressed having high levels of engagement and flow during his gaming experiences. He emphasized the importance of games and their connection to his academic and social life. Justin’s early gaming and learning experiences in Cuba, a country with very limited and censored internet access, provided a unique and special perspective.

Evan. At the time of the study, Evan was a mechanical engineering student who was interested in math and “exact answers” rather than literature or humanities. He reported working full time while studying, something that severely limited his free time. Although Evan was very motivated during the interview, he showed clear signs of frustration towards faculty and his academic life in general. His hobbies included working on cars, target practice shooting, and video games. He recalled starting to play video games between the ages of five and six to distract himself from difficult household circumstances. Evan preferred action RPG games like The Elder Scrolls V: Skyrim, where players take the role of a dragon slayer and freely roam a virtual world to solve quests related to storylines (https://skyrim.nintendo.com/), and car racing games, like Grand Theft Auto (http://www.rockstargames.com/).

While Evan reported several flow indicators, for him, freedom was the most important engagement factor in games and in academic activities. This factor was present throughout the
interview, something that seemed to reflect Evan’s feelings of oppression and stress. Evan’s academic experiences provided particularly rich insights on engagement, teaching, and learning.

**Marvin.** Marvin was a young college student majoring in civil engineering. He reported choosing that major after watching his father working in construction projects during his childhood and expressed loving the outdoors, meeting people, fishing, movies, and playing video games. Marvin enjoyed playing adventure first-person shooters like Call of Duty, Destiny 2 (https://www.destinythegame.com/), and Uncharted: The Lost Legacy (https://www.naughtydog.com/). He considered games to be a very important part of his life and reported growing up having every type of gaming console in existence. Marvin referred to himself as a pro-gamer and reported many direct indicators of flow throughout the interview. He was enthusiastic during the interview and provided a rich recount of his gaming and academic experiences.

**Megan.** Megan was a college student in her late twenties taking accounting classes while working part-time. Although she was undecided about her major, she was taking classes to update her knowledge in finance and obtain a college certificate. Megan expressed wanting to be an independent worker in the near future.

Megan’s hobbies included watching TV, online shopping, eating out, and video games. She remembered being introduced to games at an early age by her brother. Megan enjoyed playing a variety of video games on different platforms. She reported enjoying simple puzzle and location-based games on her phone like Diamond Mine (https://www.ea.com/) and Pokémon Go (https://pokemongo.nianticlabs.com/), while also playing more complex RPG, strategy, and first-person shooter games like World of Warcraft, Civilization (https://www.civilization.com/), and Star Wars Battlefront (https://www.ea.com/).
Megan referenced a wide variety of flow elements during her interview. For her, feelings of fun, excitement, and relaxation, combined with tangible and intangible rewards, were important engagement factors in games and in the classroom. Megan clearly connected her gaming experience with learning outcomes and was able to provide insightful information for this study.

**Themes**

**Manifestations of Flow.** Although participants entered the study with little or no knowledge about flow, all of them clearly experienced most of its states and were able to articulate their experience using specific flow terms or associated words. The relationship between challenge and skill was the most mentioned flow characteristic reported by participants, followed by immersion, and lost sense of time, self, and location. For example, in games, Edward reported being most engaged when a task presented a sufficiently difficult challenge. He stated,

> I am engaged when I do something difficult, something that requires my full attention, my skills. I can’t mess this up because if I step in the fire I will die. Since I am the healer, then the tank will die, and they are going to yell at me. I must put my mind to it.

Edward commented that once he encountered a worthy challenge, he felt compelled to confront it until its positive resolution, regardless of how much time or effort he would need to invest. Edward specified how the right balance between challenge and skill was necessary and important for him in any given task to stimulate his engagement. He claimed,

> Well, the challenge factor is important. If I am in a very easy class that doesn’t require me to put too much into it, is not very engaging. Now, if there are some challenging things to learn and to understand, like in calculus...
While being challenged is the most important factor for Edward’s engagement in games, he described it to be equally significant in the classroom. When talking about an engaging in-class activity, he commented,

Yeah you know, last week we had this programming challenge. We had to do a couple of classes for Java. You know, the moment that the challenge is in front of me is like taunting me to do it. Whenever in the classroom there is a challenge, a programming challenge, where you have ten minutes to do it, or you have twenty minutes to do it, I feel very engaged doing that.

Edward commented how having a specific deadline to complete a task increased his sense of urgency and challenge while activities that were not tied to such restrictions caused him to lose his interest. Similarly, Edward described experiencing a lost sense of time, self, and location while playing certain games, something commonly associated with flow (Csikszentmihalyi, 1975). He remarked how he usually forgot about being on planet “Earth” while playing World of Warcraft and how every new game’s expansion became a “very special moment,” where hours “flied-by” and went by “very fast.” While playing, Edward reported feeling “like a completely different person” and having a maximized sense of focus, productivity, and resolution.

Immersion was also a vital component of Edward’s gaming experiences. He preferred games that offer a high level of detail, allowing him to be transported into the story. He stated, I like very much when the developer keeps control of the details. He makes a big world and there are a lot of things on the table. When it really makes you feel is real. The more details there are, the more stories… You see NPCs (non-player characters) talking to each other saying things, like there is a world out there and there is a logic to that world. I
love that. I like that very much.

Sounds and music were also indispensable for Edward’s immersion. When commenting about his immersion in games, he stated,

Ok. I go home, I put on some music, and I forget I am on Earth. I just get inside WoW or whatever and listen to the game. I need to get sound from the game. I need to get sound and music from the game, otherwise, it doesn’t work.

When describing his gaming experiences, Edward commented feeling “light” and “one with the universe.” These mystical descriptions of flow, although not uncommon, are usually reported in “transcendental” or “religious” contexts (Csikszentmihalyi, 1975). They also denote strong manifestations of flow.

Similarly, Justin exhibited most common flow indicators during his gaming experiences. During his interview, he commented having won several gaming championships and expressed being very skilled in specific shooting games. Justin’s engagement and immersion were also dependent on finding a good match between games’ challenges and his gaming skills. He stated,

I don’t play easy games. I always play them in hard-core. I always play it in the maximum difficulty regardless of how they call it. It is a challenge for me. You know, I like the hardest challenge. If I put it in easy mode, I’m fighting against the easy stuff. When I put the game in the hardest and I get killed, I tell myself that I must improve my skills.

For Justin, higher levels of challenge not only incentivized his engagement, but also his motivation to learn. He commented how “playability” and “realism” were two key immersive factors for him. Justin reported temporal phenomena in games commonly associated with flow. He experienced losing his sense of location and time passing much faster than normal without
his awareness. These phenomena occurred in games that he enjoyed, especially when meeting or exceeding the games’ general objectives. When talking about his immersion in games, he commented,

Time [Fingers snap] flies and you don’t realize it because you are having a super good time… Sometimes you sit down at 10 PM and next time you see the clock is 4 AM. You say, “WOW, where was I? That’s too fast! I only played three games! How is that possible?”

Although Evan reported less manifestations of flow when compared to other participants, he also experienced moments of flow in games and in the classroom. When asked if he preferred games that were easy or hard from the beginning, he stated,

Not necessarily easy, but that you can manage. For example, in Skyrim they put you in a free world where you start being ridiculously weak. They put you in an environment where you have to learn and get a little bit of skills so you can manage it… But it kind of annoys you. Do you know what I mean? When it is too hard from the beginning and you just say, “Forget this.” So, it needs to be something in between. Something enough to intrigue enough so you want to try again if you fail, but not too easy so you are bored of it from the start.

Flow’s connection between challenge and skill was evident in Evan’s account. To maintain his engagement, games had to present an appropriate and progressive level of challenge that stimulated Evan’s curiosity and were “manageable” in order to avoid excessive frustration and boredom. Evan showed signs of being immersed in certain activities and expressed realizing this when he wanted to “keep playing another match” or stop caring about what he described as “basic necessities.”
Marvin reported similar flow experiences. Although he expressed enjoying simple games, he remarked needing a clear challenge “buildup” in order to maintain his engagement. When asked if he would enjoy playing games with an easy initial level of difficulty, he stated, *If I know it is a buildup, then yes. If it is easy the whole way, I would probably just beat it once, just because I have the game and want to get the achievements, but after that, I would be done with it.*

This buildup had to allow Marvin’s skills to progress in parallel to the game’s level of challenge for it to be enjoyable. An excessive level of challenge or complexity caused Marvin to lose interest. While talking about games that he enjoyed and their level of difficulty, he stated, *When you come to games where you have abilities and inside those abilities are other abilities and traits, by then I don’t have the time to fully adapt to that and know everything, so I don’t get the full experience from those games.*

During the interview, Marvin made several direct references to flow, referring to it as being “in the zone” or “zoned-in.” These flow moments occurred when Marvin was fully immersed in an activity. When describing his gaming habits, he stated, *I get home and usually eat. Sit down and get ready. Play some music in the background. Put on a wireless headset. It definitely increases the gaming experience when I play, considering you don’t hear all the background noise and are completely zoned-in. But I guess that would be my ritual when it comes to gaming.*

Marvin also made direct reference to temporal phenomena and loss of self-awareness. When talking about his favorite game, he reported, *Time definitely flies by. I just really get into a zone were I’m constantly grinding and I’m not aware of my surroundings at a certain point. It is a very good feeling.*
to find a game like that.

For Marvin, moments of flow were broken when games presented transitional loading screens that interrupted his gameplay. Marvin also made direct reference to flow in the classroom. When talking about his classroom experiences, he commented, “When I’m in my zone in the class, if I’m, I don’t think about anything else. I get very self-oriented in the task at hand.”

Megan’s manifestations of flow were evident in her recount and similar to other participants. She expressed being attracted to games that had the right amount of challenge, while too difficult games quickly lost her interest and attention. When talking about the difficulty in games, she stated,

They must be not too hard, but not too easy. If they are too easy, then I will get bored faster. If they are too hard, they will make me feel mad and I will just stop playing. It depends on the game, but I would say something in between.

Megan expressed feeling fully immersed in games that she enjoyed and experienced a lost sense of time, place, and self-awareness while playing, something that improved her focus and engagement. When commenting on her gaming experiences, she remarked,

When I play one of these games, time passes so fast, and I feel I’m inside the game. I forget about everything else and only focus on the task of the game, its story, graphics, sounds. For example, World of Warcraft really does that to me. When I play it, I really feel I’m that character that I’ve created and that took me so long to level.

Flow experiences for Megan were closely related to her immersion, something that she actively sought in games by creating a suitable environment for her gameplay. When talking about her gaming habits, she commented,
Well, whenever I have some time to burn or I want to relax and forget about the day-to-day stuff, I would find a quiet place, or go to my computer, and play one of my favorite games. Many times, I would put my headphones to isolate myself a little bit more and just let my mind be absorbed by the stories or just the action of the game.

Engagement, Expectations, and Feelings. A common theme identified across participants was related to their articulation of engagement, expectations, and feelings. For them, being engaged in a task was closely related to their feelings, expectations, and flow experiences. For example, when talking about his gaming experiences, Edward commented,

I feel excited. How can I say? Engaged with the game, motivated, light. You don’t feel as bored or as heavy you know? Or as lazy. I feel “good.” Because there are other games that I play for many hours too, and time flies, but not like in WoW. Because WoW leaves you feeling “good.”

Edward experienced similar positive feelings and engagement in certain academic activities that sufficiently challenged him. During these activities, he reported feeling “productive,” “ready to take on anything,” and wanting to get to the next task right away. When talking about academic activities, Edward commented how they were engaging if they remained challenging and had what he referred to as the “probing factor.”

Another aspect remarked by Edward was related to expectations. For him, expectations were built during the initial interaction with a class or game and could have a significant impact on engagement. He reported that for an activity to be engaging, it had to include an element of surprise. To maintain his engagement, Edward remarked how variety was also a needed expectation. When commenting on how he envisioned the ideal classroom, he stated,

A class that has every time something new to add to the table. Every day you go, and
you don’t know what to expect. That is important. Because as humans, when we do something, we build an expectation about it. Tomorrow when I go to class again, I have built my ideal expectations for what is coming next… Even if you do the challenge, if people are expecting it, like if in every class there is a challenge, it may be fun at first, but afterwards, it is going to die down. So yeah. It really is about a combination of things. Expectations are important.

Gaming experiences evoked a myriad of emotions in all participants that were connected to personal circumstances and factors. Edward expressed having a special bonding relationship with World of Warcraft, a game he had been playing for more than ten years and was present during important developing years. He expressed,

I think that more important than anything is my relationship with the game. More than what they do. It triggers memories you know… Memories from childhood. Like I played this with… Or when you visit a place and I played there with my brother… “Uh, do you remember we were here and the alliance ganged us?” You remember and that creates a bond.

Edward’s bond also generated strong feelings of devotion and loyalty, driving him to go back to the game through the years. He stated,

I started WoW in 2006. We are in 2017 now. I was 14 when I started WoW. So, I’ve played it all my life and there is no replacement for it. I played other games. I played them for some time, but I always come back to WoW. I quit WoW for one year or two and I’m always back to it. It is like the “source.”

Similarly, Justin’s engagement was also connected to his feelings toward games and flow experiences. He was very passionate when talking about games and referred to the feelings that
games evoked in him several times during the interview. He stated,

Well, like every gamer, that is my passion. I enjoy playing more than other people enjoy going to a party, club, etc. When I’m playing those games, for me it’s the “greatest” feeling. Every time we won it was like, “Victory!” You feel good. You feel happy because it is a passion that you are putting into practice. We really experienced very beautiful moments.

For Justin, experiencing positive feelings when playing was not only an important part of his gameplay, but also part of his expectations.

Like Justin, Evan’s engagement was also closely related to his expectations and feelings. He described being engaged only in games that provided a wider sense of freedom, intrigue, and adventure. For Evan, games had to incite his curiosity and provide a strong sense of empowerment and recognition. These factors were prevalent throughout his interview. When commenting on his feelings while playing, he stated,

I feel intrigued and always willing to go further. Why do I say it in that sense? I am very into adventure games. Those type of games somehow create a virtual environment where you just want to keep going through… It’s the feeling of superiority even though it is a video game. One of the reasons I don’t like certain video games is that you can play the entire game, beat it, and you are not recognized in the game for it.

For Evan, strict rules and restrictions were important impediments for his engagement in games and in the classroom. This was a dominant point in his interview and seemed to reflect feelings of oppression and resentment toward the educational system’s status-quo. When talking about his academic experience, he stated,

Personally, one of the things that I hate about school is that you are forced to remember
so much crap. So much crap. And they know it. The professors know it. The moment you take the test, you are not going to care about anything. You just want to get that A.

It should not be like that.

On the other hand, Marvin reported being most engaged in multiplayer games that offered a good story and a clear scoring system. Feelings of accomplishment and success were also very important and linked to Marvin’s engagement. For him, games that did not allow him to excel and lacked a clear scoring system made him feel as “just another player” failing to motivate him to continue playing. When talking about games were Marvin was able to stand out among other players, he reported,

I just feel very satisfied with myself for what I did, and I just can’t wait to wake up the next morning to keep going. I constantly think, “Man, this adds to my grind, I was in my zone.”

In the classroom, Marvin commented being focused and engaged when objectives were clear, subjects were relatable, and professors demonstrated professionalism together with genuine care for their classes and students. When talking about his engagement in the classroom, he stated,

I feel bored only in a pointless class or when I see that the professors are very laid back and don’t care. They don’t want to be there. Are late all the time. It really depends on that. Because I don’t want to put the maximum effort for a teacher who is not going to reply to my emails, who is not going to help answering the question, or answers with another question. Things like that.

Similarly, Megan’s engagement was also highly dependent on feelings evoked by certain games and other factors related to flow. In several occasions, she commented how reaching
games’ objectives would stimulate feelings of excitement, accomplishment, and motivation in general. These feelings were incentivized by games’ reward systems and received audio-visual feedback of her progress. Megan described how her expectations varied depending on the complexity of the games she played. When talking about her engaging experiences in games, she stated,

Well, in simple games like Diamond Mine, I enjoy moving to the next level and the rush you get when you barely finish that on time to move on. Even though you know it is a simple game, you feel a rush of accomplishment when you advance. So, I guess the rewards like the score, badges, and just the excitement of the action in those games are factors I like. In more sophisticated games, I like the exploration, the mystery of a good story, and the freedom to progress in the game at your own pace… Once in Diamond Mine I was having a really long winning streak. My score was passing one million and I was really getting far. I remember almost losing a round when I found a special diamond next to another one. So, when I merged the two, the whole board cleared out! This happened together with a huge lightning bolt and cheers in the game. I felt really good you know? Like if somebody was cheering for me.

Health Related Issues in Games. Although not as pronounced or extensive as other emerged themes, an additional common object of concern for participants was related to health and safety issues associated to video games. When talking about video games, references to health factors like addiction and stress were mentioned by all participants, something that is important to report. For example, Edward recognized his relationship with games and was aware of their addicting characteristics. Several times during the interview, he referred to his gameplay habits as an “addiction.” Although his references were always made in a jovial tone, he
expressed being compelled to return to World of Warcraft regardless of the quality of future expansions. When asked if he would return to the game even if its quality was severely compromised in the future, he stated,

I would play, yes. Because it is impossible not to. But I would probably play less. I would unsubscribe and get tired faster, but I’m guaranteed to know that when an expansion comes out I’m going to level. I’m going to get to the max level, and I’m going to play a couple of weeks. That’s all I know.

Similarly, Justin demonstrated being aware of the negative effects of excessive gaming and how it could affect his life. He remarked the importance of being “disciplined” and exercising self-control in order to enjoy games and avoid addiction. He stated,

When I first came to this country, I told myself that I wouldn’t play video games because I would be placing my life aside. As you know, to play video games, you must have control over your life since you can become a fanatic and place your life aside to stay in front of a computer. That’s not what I want.

On the positive side, for Justin, playing video games provided affordable, safe, and relaxing entertainment in the comfort of his home. Games not only helped him to avoid the dangers of the outside world, but also kept him engaged and away from the destructive influence of alcohol and drugs. When talking about his gaming experiences, he stated,

For me, a computer is a wonderful hobby. You must invest some money initially, but trust me, you save a lot more in the long run since you would not go to clubs and other places as often. It is good to go out and entertain yourself, but staying at home playing video games, being at ease and safe in your own house, for me that is invaluable… In this country though [U.S.A], with the amount of car accidents and so many friends
becoming addicted to drugs or alcohol, it is better to stay safe and calm at home. I see it as a very calm thing. I study, I have my job, I have my girlfriend, and I have video games. I don’t ask for anything more.

Evan experienced something similar. For him, games were a great help to temporarily escape from reality and cope with difficult situations, something that helped him to maintain his mental health under adverse circumstances. When commenting about his relationship with games, he stated,

In a sense, simply because I kind of had to “wake up” when I was like fourteen and realize my situation… I have such a great appreciation towards video games in general simply because they distracted me growing up in a difficult household.

On the other hand, Marvin referred to games as a tool that allowed him to relax and spend special private time. Game sessions for Marvin represented times for reflection and introspection on daily events. Gaming experiences contributed to his personal development and mental wellbeing. When commenting on the influence of games in life, he stated,

They kind of gave me a lot of “me” time. If I was having a tough day and went to play, I would feel relaxed and think to myself that maybe “that” moment wasn’t worth it. Reflect more on something. Because it is not just passing time. People may consider it like a meditation kind of ordeal.

Marvin also briefly described how excessive gameplay could lead to negative consequences. For example, when commenting on his engaging experiences, he described how he would play for hours without stopping until realizing that it was too late at night, he forgot something important, or he even skipped meals.

Similarly, Megan expressed having high levels of stress at her work and using games to
not only pass the time, but also to relax and “forget about everything else.” When talking about the positive and negative effects of games, Megan was particularly detailed in her recount. She stated,

When I stop playing, I many times realize that it is very late at night. Time passes really fast when I’m playing those games. That is good, but is also bad. Because it is very easy to get caught up in the game you know. And when you realize it, it is deep at night and you have to go to work early the next morning. Or on the weekends, you realize the whole day passed just playing the game. You have to have some self-control you know? If not, you can easily get lost in that. I know some people that are always late to school and it is because they are playing games.

Similar to other participants, Megan reported being aware of the addicting effects of excessive gaming and commented on how to lower that risk, she stated, “So having self-control is important. Very important. Like in anything else that you enjoy. Like eating. I love eating nice things, but if I do it too much then I will get fat. Same thing happens with games.”

**Social Aspects of Games and Learning.** An important common theme that emerged from interviews was related to social elements of games and learning. This subject was extensively discussed by all participants who considered it a vital component of their gaming and academic experiences. Socially related topics like friendship, pride, freedom, power, competition, collaboration, and communication were all part of participants’ experiences.

For Edward, playing games with others was an indispensable part of his experience. While Edward’s brother was his first gaming partner, his gaming circle greatly expanded later on and included online friends from all over the world. Edward commented how games like World of Warcraft encourage socialization and friendships though “guilds” and other organizations. He
also commented how the need to “stand out” from the rest of players was an indispensable driving force for his engagement and part of the challenge in games. When commenting about factors that contributed to his engagement, he stated,

I think the factor is the same in games and in the classroom. Something about pride. Maybe. About ego. When you have a challenge in front of you in a game or in a class they are telling you: “Are you smart enough? Are you good enough? Then prove it” The factor is you want to “stand out.”

For Edward, “standing out” was not simply feeling better than other players, but a state of mind with wider implications. When referring to engaging factors in the classroom, he stated, “The factor is you want to ‘stand out.’ Not necessarily because you want to be better than the others, but because I understand this is an easy challenge compared to where it is going in my profession.” Although Edward remarked being more individualistic and competitive when it came to games and learning, he recognized the importance of collaboration and mentioned it as an important engagement factor not only in games, but also in the classroom. He also briefly and indirectly mentioned the importance of communication in games and how communicating with friends and other players, had enhanced his gaming experience.

For Justin, gaming experiences were not only closely related to collaboration, competition, and communication, but most importantly represented a means to socialize and cultivate meaningful friendships. Throughout his interview, he emphasized the importance of establishing social connections. For example, when talking about how he prepared for a gaming session, he stated,

Using phone apps, we try to gather people. “Listen let’s play tomorrow. Wake up early. Let’s play at ten, eleven, twelve o’clock” Depending on the time that you go to sleep the
night before. We always try to plan, so that we know when we are getting home and make sure we are done with what we need to do so we can play.

Justin also commented how games provided him with a socializing medium that helped him develop real-life friendships and alleviate his feeling of isolation as a new immigrant. He stated,

I was part of the Mexican and Venezuelan gaming clans. As a new arrival in the U.S., I was alone and didn’t know many Cubans. I would be asked to play and compete for different teams. There is a large community of gamers. There is always a chance to play with many people. Not only with the people closest to you. You can always ask somebody you don’t know to play. Doing that, I’ve meet a lot of people here from many places. Many from Spain. I have many Spanish friends. It is a big family that I have there now. I know about seven or eight people there. They told me, “Come here! Come here!” I am dying to go next year.

For Justin, gaming was clearly a social activity best enjoyed face-to-face with his friends. When Justin was living in Cuba, he overcame several obstacles, including the lack of internet access to pursue his passion and play together with his friends. When talking about his gaming experiences in Cuba, he explained,

I meet many, many people. We would get together in somebody’s house, buy food and sodas, and play together. We would bring all the computers to a single house and play next to each other. We would be screaming to each other, “Hey I killed you!” [Laughs]. Justin expressed being a team player and considered collaboration to be a key factor.

When talking about collaboration versus competition in games, he stated,

When I play with my friends, I have a great time. We help each other. I’m very team
oriented. I like collaboration. I have a very team oriented and strategic vision. So, in a team, I’m always the strategist, “Let’s hide here,” “Let’s wait over here,” “Let’s go towards that direction to find resources,” “Let’s wait here since for sure another team will come looking for resources and we can ambush them and take their resources.” I’m also competitive because when there is angry people that feel they are better than you, I don’t like to argue. I just tell them to play against my team, save words, and use the game instead.

On the other hand, Evan enjoyed games that allowed him freedom to explore without strict rules or restrictions. Although he reported several social characteristics associated with his gameplay, social engagement depended on the type of game he played. For example, while Evan expressed preferring playing RPG games in single-player mode, he enjoyed playing first-person shooting games with others. When playing multiplayer games, the most important aspect for him was the sense of empowerment and superiority given by winning in a competitive environment. He stated,

Let’s say, a game like Call of Duty. I will feel good by simply being the best one. And even if there is no actual physical reward, it is just the statement of saying that you are number one in a group of twelve to sixteen people. It kind of makes people feel better I guess. I used to play multiplayer games but now I just enjoy that free world aspect. You take a game like Skyrim. They ruined those kind of free world games by adding multiplayer simply because you are always going to have another guy that has way too much free time in his hands and is going to belittle you in those type of games. You want to feel powerful in those kinds of games. Do you know what I mean?

It is clear from Evan’s statement that feeling less or more powerful than other players in
certain games had a significant effect on his engagement. Finishing at the top and receiving appropriate recognition was crucial and related to Evan’s feelings of pride not only in games, but also in the classroom. While talking about multiplayer shooting games, he expressed how “receiving that praise from complete strangers was amazing,” and described ending at the top of the scoreboard as an exciting “mental competition.” When referring to a classroom assignment that Evan considered engaging, he stated, “I felt good. Especially because I was the first one to do it. I remember coming late to that class [laughs]. I was the first one to actually get it done, and get it done right.”

Similarly, for Marvin, the social aspect of games was determinant not only for the level of his enjoyment, but also for his selection of gaming platforms. When commenting on his gaming preferences, he stated,

I like to play with other people. I recently got a PS4 Pro and I still have the Xbox One. I came back to XBox One because I have a lot of friends on that console compared to the PS4. But definitely, the PS4 is winning right now. I would love to stick there, but it just depends on where my friends are.

Marvin emphasized several social aspects of games and their transformative qualities. Based on his observations, Marvin indicated how gamers developed stronger social skills and were more extroverted within their social circles, when compared to non-gamers. He stated,

I definitely think that gaming is affecting this generation. It definitely affected mine. Personally. I have friends that still to this day don’t touch consoles or games and I see how they are. And I have other friends that play and I see how they are. I see how their interacting is very different. When it comes to socializing, I noticed that my gaming friends are more talkative compared to, let’s say, my athletic friends. The people that
play video games relate more. They are more people persons.

Mervin commented how games were conduits for expression that incentivized communication and even pushed introverted players to socialize within the games, something that eventually had transformative effects. When talking about gamers’ socialization habits, he stated,

Yes. They socialize much more. One of my friends has a little brother. I never talk to him and I wish I had a conversation with him when we picked him up from school. He never talks, but the moment he gets home, and he gets in his console, all you hear is talking and chatting. I’m assuming is that phase. He is around fourteen and is a little antisocial. But, people like that, I know that once they get to meet someone or talk to certain people within their circle, they are very social. They won’t stop talking. They love to communicate, and they just need to branch off from that to other groups to make more connections and progress.

Marvin expressed how games need to be fair, allow a wide level of freedom, contain lenient rules, and have a combination of collaboration and competition elements. Although he preferred working individually, he explained in his view how by “correctly” dividing tasks it is possible to be efficient in teams and simultaneously create a healthy competitive environment that would lead to better performance and freedom of choice. When talking about collaboration versus competition, he stated,

I prefer working individually because other people tend to leech off and that really upsets me because that brings down my grade eventually. When it comes to collaborating, if everybody does their individual assignment and at the end join… For example, in making a game you have the designers, the graphics. You have everybody in their own field and
then you all put it together. To work together. That is efficient and very good. At the same time, I feel like if you have those different groups, but you have five of those groups and then you have the designers all competing against each other to be the best, and then you have the script writers… You choose the best out of those and it will motivate those people to do it even better. So, having collaboration and competition at the same time I think it would work best.

Like other participants, Megan commented how playing video games was an activity that she enjoyed with friends. For her, friends’ praise and feedback were an important part of the gaming experience, while being able to make a difference in a match by having enough power and freedom to stand-out, were also crucial gaming factors. When commenting about her gaming experiences, she stated,

Oh yeah. I like futuristic shooters like Battlefront. I remember once when I got to play one of the heroes there and I felt unstoppable. I really killed like 40 enemies or more and carried that game to victory. It made the difference you know. I remember being praised by the other players and that felt good.

For Megan, competition and collaboration went together in games and in the classroom. For her, competition was needed not only to increase her motivation and performance in games, but also to emphasize her sense of power and as a reward for excellence. On the other hand, for Megan, collaboration provided a conduit for establishing new friendships and facilitate tasks.

When asked about collaboration versus competition, she stated,

Well it is important. You need to have competition so that people push themselves. People always want to feel they are special or that they are ahead of others. That is a reward in itself. Now collaboration is also important because it makes things easier most
of the times. It helps to create friendships. Many of my school friends have come from team assignments that we had to do. So, I guess you should have both.

When talking about collaboration in the classroom, Megan expressed valuing the interaction that occurred amongst teammates and the new relationships that emerged from those interactions. She also remarked the importance of group discussions and other social interactions in the classroom. When talking about competition in games, Megan expressed caring about feelings her gameplay generated in other players and remarked how making others feel “a little jealous” of her in-game special powers made her feel special and rewarded.

**Games, Learning, and the Real World.** The last identified theme involved accounts that related gaming experiences with learning and the real world. All participants expressed having learned something valuable from their gaming experiences and reported different factors they considered indispensable for fostering engagement, effective teaching, and learning. Edward commented how his gaming experiences had helped players like himself develop a series of skills that were useful not only in games, but also in real-life. When talking about skills that he and other players had learned using games, he stated,

You know, I have a friend. She has been my friend for a very long time and I am in her guild. She deals with people and their needs. It is not just the game, it is understanding people. Understanding what keeps them in the guild. So, there is a “lot” to learn that is personally relevant and also social… You learn a lot about how to deal with people. Even how to deal with respect and how to handle disagreement.

Edward also connected his learning in games with his computer classes and expressed how his gaming experiences helped him to develop a sense of discipline and care for precision. He commented,
Another thing that is not socially related in WoW involves some programming, like when you make macros. You learn a little bit about how computer languages work and you must be exact. You get a comma in a wrong place and the macro doesn’t work. So, when I get to C++ and Java I never make that rookie mistake. Oh, you missed a semi colon, c’se c’mon if I miss a semi colon in WoW you know it won’t work.

For Edward, the lessons learned through games had special importance. Not only he considered those lessons valuable, but he also expressed being aware of how others had used those skills learned in games to obtain tangible benefits in the real world. When talking about how his gaming experiences contributed to his learning and personal development, he stated,

This is “very” important. Because World of Warcraft is a complex game. I don’t know if you heard the story of this guy that became the C.E.O. of Starbucks. He put WoW in his resume and they gave him the job because he elaborated on that, he said: “you know I managed a guild and this is difficult.” It is like running a business!

Edward referred to Stephen Gillett, a technology and business leader who included his World of Warcraft virtual character details in his resume and explained how the skills learned in the game were transferable and valuable in real-life, something that was claimed to have helped him secure his C.E.O. position at Starbucks in 2008 (Pagliery, 2014).

Similarly, Justin valued games’ learning and teaching qualities and expressed disliking games that were not realistic. Playing historical war games gave Justin valuable historical knowledge that he used in his academic activities and classes. When commenting on the learning value of games, he stated,

I like very much realistic games. For example, the Call of Duty games, they have taught me history. Not only U.S. history, but also the history of many countries. I learned about
the wars, when they happened, their causes, the death of important people of the world.

How that president died. Why he died. The bad policies that he applied to the country in those times. How life was back then. That is why I like realistic games, because they teach you those things. They teach you facts that really happened in the past.

Games also introduced Justin to the English language and helped him to learn many words visually and by association. Simultaneously, his passion for computer games, the lack of internet access, and other circumstances drove Justin to acquire technical skills necessary to build custom-made computers, and configure home gaming networks, databases, communication tools, and many other related software and hardware tools. During this gaming and learning process, Justin developed a more analytical and strategical thinking, something that motivated his learning. When talking about his gaming experiences, he stated,

For example, if it is too difficult, you die with two or three shots. If you know there is always people around a door, you are not going to run through that door when there is people on the other side. So, you think about it, and think to throw a grenade first. I “stun” them, and then get in to kill them. Do you understand? It helps you to think and to process the game more.

Justin remarked how he applied what he learned in games to his classes. He proudly recounted how he was considered one of the best students in his history classes and how several of his academic projects were inspired by the games he played. When talking about his academic experiences in Cuba, he recounted,

When I was in Cuba studying, I was always the boss of my history class because I knew a lot about history and it was my favorite subject. Games helped me a lot. It was my favorite subject from middle school. So sometimes in class, we would talk about World
War 2 and I already knew about it. When it happened, its causes, and in which countries.

Sometimes the professors will ask me “How do you know about that?.” I even didn’t have to take the tests sometimes because the professors would tell me to go home. One time in high school or middle school, I don’t remember well, we had to do an activity about the death of an historic politician. Based on a game, I recreated a scenario where two or three of us would dress for the part and hide. We did it in an outdoor opened location of the school. Two or three people hid behind a wall and then, based on a game, the politician accompanied by a woman would come in the scene and pretend to be killed. It was like a play that I based on a game.

Similarly, for Evan, learning was associated almost exclusively with knowledge that could be immediately used at his job or in real-life. When asked about his learning experiences in games, he initially was unable to offer any comments or examples on the subject, but later described how games helped him to develop “quick reactions” and reflexes. When talking about his academic experiences, Evan also reported valuing only classes that offered practical information applicable to his job. He stated,

The only class honestly was the computers class because I knew it was going to benefit my job. But, sadly man, I’m going to school and is one of those things. I just care about maintaining my 4.0 GPA and getting that degree.

Evan expressed the need for professors to convey the importance of their teaching and create close links between class material and practical applications. He remarked how practical knowledge led him to obtain tangible benefits in his real-life. When talking about the ideal classroom experience, he stated,

What professors should learn to do is make students appreciate knowledge. It is not so
much about just memorizing something. It is about appreciating knowledge and the “why.” Honestly, I feel that you value something when you appreciate it. Back to my computer class, since after I graduated from high school, I went two years without using a computer and I forgot basic computer skills. So, for me, I can appreciate that knowledge. Especially since now, one of my promotions was simply because I knew how to use the computer.

Evan remarked how learning should be a more “free” process with more options, fewer rules, and less “fear” of repercussions for not following them. For Evan, leading rather than following was important, together with reaching desired results by using the method of his own choosing. This philosophy was applicable for him not only in games, but also in the classroom and real life. When talking about his vision for the perfect class, he commented,

Is that feeling of you having to follow. You must be within these parameters or you won’t be rewarded. I guess any class that simply do not penalize you for being different would be great. Doing things with a different method even if you get the same result…

At the workplace, for example, sometimes managers, or whoever, must do sneaky things in order to pull numbers. You are assigned to get a certain target. That’s the real world that we live in.

For Marvin, gaming experiences allowed him to grow at a personal level while fostering new interpersonal, social, and organizational skills. He reported that by observing the behavior of some players, he was able to better discern between a correct and incorrect social conduct, while obstacles motivated and challenged him to continue playing and learning. When talking about the influence of games in his life and learning, he stated,

Games have really affected who I am today because I know how to be a people person. I
know how to socialize. It has really showed me how to speak to others. With the stubbornness I had playing, it has definitely showed me that when it comes to an obstacle I can surpass it as long as I put the effort into it… It made me realize a little bit what I was doing. It really got me into that. I know a lot was the communication skills. It really made me a people person, because everybody knows that in those game consoles there is not too much nice things going around. It is really talking in the real world. How to be a people person. How to deal with that.

Marvin expressed not being aware in his early gaming days about the connection between some of the games he enjoyed and his learning experiences. Later in life, he realized how certain games not only matched his gaming preferences, but also fostered learning and even guided him toward a career choice. When talking about his learning experiences with games, he commented,

When it comes to RPGs and shooters, those are entertainment and time passers to me.

But when it comes to structural games like Minecraft, those are games that I was interested in, and I didn’t really understand why. I started looking into majors in high school and I saw civil engineering, which kind of took me back to that. It kind of made me realize a little bit what I was doing. It really got me into that.

Like other participants, Marvin described needing freedom of choice in the classroom in order to motivate his engagement and remarked the importance of teachers in the learning process as motivational agents. He described how being able to relate to them and class content was indispensable. When asked about moments of engagement in the classroom, he stated,

In a class, is usually when a teacher calls out on people and gets them to relate. I don’t like, for example, when a teacher brings a mid-life situation into it. But mainly personal
experience, because it is how the mind works. Personal experience really engages memory and it really helps to progress in that, to keep it fresh in your mind, compared to something that is completely irrelevant.

Finally, Marvin expressed not only being social and communicative, but also enjoying working in an outdoor environment that offered hands-on real-life activities. He transported these preferences to the classroom and commented about how, in his opinion, the stereotypical perception of gamers was wrong. When talking about this subject, he stated,

I know many will disagree with that, because they think people that play games want to stay home. Stay in a little man-cave and isolated. It is really not like that because you are communicating with others, even if it’s not visually. It is like people who video chat all the time. If you are home video chatting, you are considered a social person, but that is not a face-to-face contact. When it comes to talking, even in a game, I take face-to-face contact compared to video chat anyway because is more hands on. You get better expressions, you are there together, you do activities compared to sending texts.

For Megan, games were a catalyst for learning in different areas. When commenting about how games helped her to learn about computers, strategy, problem solving, patience, and perseverance, she stated,

Well, in practical terms, some games have helped me to develop my computer and technical skills. For example, I have learned about computer requirements, video cards, and other stuff. I have also learned how to approach a problem in a more methodical way. Trying to understand it and attack it from different points of view. In shooters for example, you learn some combat tactics. In a game like World of Warcraft, you develop a lot of patience and strategy so that you can level the fastest way or take a boss down.
Megan also remarked how games helped her to develop research skills and how teachers had a crucial role for her engagement in classroom activities. Like other participants, for Megan, learning was associated with challenging real-life applications and activities that were guided by an engaged teacher. These learning experiences needed to provide freedom of choice and a clear connection to tangible objectives. When commenting about necessary factors present in her ideal classroom experience, she stated,

Well the teacher definitely was the most important factor because he was the one that gave us the task and explained how to do it. He also was kind and had a lot of patience with us. He gave us some freedom to do things differently if we wanted. As long as we accomplished the task correctly. Now the activity itself was also a factor I think, because if the task was just to read something, or write an essay, something that I could not relate to or understand its usefulness, then I would probably not have paid as much attention...

If the teacher is not engaged in the class then the students won’t be either. When I’m not engaged I simply don’t pay as much attention. I feel bored, or uninterested… Also, it would be a class that teach us useful things that we can apply at work or in our life. Many times we are pushed stuff that we don’t see the need to learn and we learn it just for the test you know? But if we are shown stuff that have a practical and real use, then you learn that with more interest and more attention.

Finally, Megan commented how teaching should be connected to elements considered relevant by students and provide a more engaging, fun, and interactive experience. Megan summarized these remarks when she stated needing “something different from just listening to a lecture.”
Conclusions

Participants’ interviews, transcriptions, annotations and preliminary analysis led to the emergence of five core themes: (1) manifestations of flow, were participants described their flow experiences; (2) engagement, expectations, and feelings, were participants described their engagement experiences, feelings, and expectations in games and the classroom; (3) health related issues in games, were participants recounted their views on health related effects of games; (4) social aspects of games and learning, were participants reflected on social aspects of games and their learning experiences; and (5) games, learning, and the real world, were students recounted and reflected about their perceived relationship between games, learning, and real world applications. The preceding themes identified important commonalities in participants’ responses and revealed significant aspects of their gaming and learning experiences. The following chapter discusses the analysis of these findings along with their different implications with the goal of expanding our understanding of students’ experiences and produce relevant and valuable insights for educators looking to create a more student-centered learning environment, facilitate active learning, and increase students’ engagement.
Chapter 5: Discussion of Findings

By exploring college students’ gaming and academic experiences this study obtained insightful findings that answered the research question and were valuable for educators seeking to understand students’ viewpoints and create more engaging learning environments. The rich recounts provided by participants, together with the rest of the data collected, produced a substantial amount of valuable information that was analyzed to produce themes based on objects of concern mentioned by all participants. Interpretative Phenomenological Analysis (Smith et al., 2009) allowed the researcher to explore students’ experiences and how participants made sense of such experiences from a teaching and learning perspective.

The analysis of the data and its interpretation were also guided by flow theory (Csikszentmihalyi, 1975) and its tenets. This study found that all participants experienced manifestations of flow and were able to clearly articulate its associated states. This was especially present in recounts of gaming experiences where all students reported an increase in focus, attention, and engagement together with lost sense of time, self, and location. These manifestations of flow were generated in great part by the challenges present in games and their immersive characteristics. Challenge was in fact the most frequently reported factor associated with students’ flow. The right balance between challenge and skill was not only found to be an important predictor of flow as claimed by F. Massimini et al. (1987), but also crucial for students’ engagement, confirming the relevance and validity of flow theory as the used theoretical framework for this study. Although participants were not formally exposed to flow theory and its tenets, their recounts described flow using terms directly associated with the phenomenon, something that denoted their awareness of its presence.

Participants were also aware of the influence of flow in their gaming experiences and
indirectly regarded it as a familiar, positive, and special state that they looked forward to experience. The inherent link between games and flow, proposed by Csikszentmihalyi (1975) was confirmed in this study while flow, although present, was considerably less frequently reported in academic activities. Although all participants experienced different flow states in academic activities, awareness of these optimal moments remained less obvious than in games, something that can be explained due to a wide variety of factors present in games but generally absent in academic activities. Many of these factors can be associated with the immersive characteristics of certain activities, while others are closely related to sociological, motivational, and emotional elements.

Although each factor plays a specific role in games and academic activities, this study found that only when combined do they constitute an important generator of flow and students’ engagement. By analyzing students’ experiences in games and academic activities, this study was able to identify many of these factors and gain a better understanding on how they contribute to generate moments of flow and engagement.

In sum, gaming moments of flow reported by participants were abundant, special, social, engaging, and often associated with educational outcomes. Students’ gaming experiences not only provided entertainment, but also served as catalysts for reflection, research, and learning. The intensity and enjoyment of some of those experiences created a bond among participants, generated found memories, and increased their positive disposition towards gaming activities. This chapter will review the different implications found from the analysis of the data and discuss how students’ gaming experiences are closely related to engagement and learning.

**Implications: Engagement and Active Learning**

The analysis of the data revealed a close link between flow, students’ engagement, and
their immersion. In games, participants reported being immersed in activities that required their full attention while providing audio-visual stimuli in rich and detailed virtual environments. These virtual spaces contained some of the complexities found in real-life, but without necessarily being realistic representations. The perception of being inside a scenario and being an active part of the action provided students with the level of involvement necessary to produce and sustain their engagement. The freedom that these virtual experiences provided was also a crucial requirement for their engagement. Participants frequently reported being stimulated by the ability of choosing their own path and being able to explore different options and possibilities without fear of repercussions or punishments.

Immersion and other conditions generated by certain games produced moments of flow that had positive mental benefits for participants. Not only they reported being relaxed from playing certain games, but they also expressed being relieved from external conditions and worries when playing, something that made a positive impact in their lives. The close connection between flow and immersion together with its positive effects were evident in certain participants’ recounts. For example, for Evan the immersion and moments of flow provided by games allowed him to escape from difficult household situations, while for Edward and Megan games provided a way to detach from mundane worries of reality. It could be argued that without immersion, these effects and moments of flow would not be as easily achieved.

Another pivotal aspect was the ability of participants to “make a difference” in the outcome of games. Although rewards received in games were intangible, participants’ awareness of their in-game significance and how their efforts could produce immediate positive results played a fundamental role in their engagement. Participants’ sense of significance was exacerbated in games with stories that placed them at the center of the action, provided a series
of incremental rewards, and kept players informed of their progress and achievements.

The close interrelationship between flow, immersion, and engagement observed in this study not only supports the historical definition of engagement that defines it as a sense of involvement in activities that offer a multidimensional combination of behavioral, emotional, and cognitive elements (Trowler, 2010), but also expands this definition by including flow’s elements and its associated states.

Traditional lectures are unable to provide truly immersive experiences and therefore cannot trigger the level of engagement and flow that some novel teaching methods can provide. In order to be effective, the modern classroom needs to incorporate immersive audio-visual activities that transport students to specific scenarios requiring their full attention while presenting challenges that meet educational outcomes and offer students opportunities to make significant contributions to their own learning experience. To accomplish this, virtual reality experiences and games could be adapted to meet educational goals and facilitate their incorporation to the classroom while other more traditional activities should also be considered.

**Implications: Motivation and Feelings**

This study confirmed the reciprocal relationship between engagement and motivation suggested by several authors (Reeve & Lee, 2014; Saeed & Zyngier, 2012) and the close link between flow and intrinsic motivation (Moneta & Csikszentmihalyi, 1996, p. 279). In order for flow to manifest, all participants expressed needing to feel sufficiently challenged and intrigued, especially at the initial stage of an activity. Being intrigued or provoked by a posed challenge is a phenomenon associated with students’ personalities and their intrinsic motivation.

The importance of intrinsic motivational factors was clearly remarked by Marvin when he commented how intrinsic motivation would push him “to do more” in games. When
reflecting on factors that motivated him to reach games’ achievements he commented, “Personally, I think it is self-motivation. Without that, you are not going to get too much done”.

In turn, students’ motivation is affected by external factors like the level of freedom and choice available in their academic activities. For example, while students can easily identify and play games they find enjoyable, many academic activities do not offer a similar choice. Even though students may select majors based on their preferences, a large number of foundational courses are generic and normally designed to instruct content using the traditional lecturing method.

Another important motivational factor mentioned by all participants and related to their engagement was the ability of games to generate feelings of enjoyment and entertainment, especially while being in the “zone” or flow state. While participants emphasized the importance of having “fun” in games, something that motivated their engagement, they used different terms when referring to their enjoyment in academic activities. For participants, enjoyment in the classroom was more closely associated with the level of challenge and variety of activities introduced, while mystery associated with unknown topics was also an important reported factor.

Another important engagement factor found in this analysis was the deeper feelings of affection associated by participants with certain games. These feelings were generated by gaming experiences that established relationships of trust and a special bond between certain games and their players, something that constituted an important source of influence and motivation. The circumstances surrounding the discovery of enjoyable gaming experiences and moments of flow were determinant in the establishment of those bonds. While all interviewed participants expressed being avid gamers from an early age, most reported being introduced to
video games by a close family member and remembered their gaming beginnings with fondness. This emotional bond established from childhood had an important influence and positive effect in participants’ perceptions of games and their engagement. This emotional link was notably remarked by Edward when he commented how his ten year experience with World of Warcraft had established a special bond that was “more important than anything” in terms of differentiating engagement factors, or by Evan when he expressed having a deep appreciation for games due to their help in coping with difficult situations, something that in essence was similar to Csikszentmihalyi’s first flow experiences described by Sobel (1995).

Feelings of excitement and intense happiness during moments of flow in certain games were also important influencing factors reported by all participants. The ability of some games to trigger these intense feelings differentiated them from others that participants simply described as “time passers”. These feelings not only contributed to their engagement and flow, but also motivated them to keep playing towards forwarding games’ objectives and generating feelings of accomplishment and success.

While certain games also generate feelings of frustration and anger in participants, these were sporadic, considered normal, and even part of the enjoyable gaming experience. Negative feelings experienced by participants matched some of the states associated with flow and occurred when participants met challenges that were too difficult, or they were outmatched by other players. These finding were in agreement with flow’s tenets and confirmed the importance of having the right balance between challenge and skill in order to achieve flow (Csikszentmihalyi, 1975, 1997; Moneta & Csikszentmihalyi, 1996).

In order to significantly increase students’ engagement, this study suggests the need to utilize activities able to evoke students’ feelings and positive emotions in the modern classroom.
Simultaneously, students’ intrinsic and extrinsic motivational factors must be considered when designing classroom activities. Although motivational factors vary between individuals, using customized versions of games together with other forms of entertainment activities that offer external rewards in the form of points, badges, and general recognition, will greatly increase the chances of generating positive emotions in students, something that in turn will contribute to create truly memorable learning experiences.

**Implications: Social Dynamics**

This study found motivational and emotional factors in participants’ experiences closely related to social dynamics that were important for their engagement and flow. Participants’ engagement in games were mostly reported as shared experiences where the presence, influences, opinions, and feelings of other players were of paramount importance.

Participants not only valued the different positive feelings that games evoked in them, but they also cared and were aware of other gamers' feelings generated by their own in-game actions. For example, Megan recounted with satisfaction how her in-game abilities evoked feelings of jealousy in other players while Marvin commented how one of his favorite gaming memories was when the host of a game turned off the gaming session in frustration due to his extraordinary ability to recover from a low score. An important factor that established Marvin’s experience as a memorable one was the series of mixed feelings it generated. These included feeling “upset” due to the sudden interruption of the game, while simultaneously feeling “really hyped” and “excited”. This mixture of feelings had a significant influence in participants’ relationship with games, their engagement, and flow. Although negative feelings were present in participants’ experiences, occurrences were low and expected by participants, something that minimized their reported negative effects.
While this study suggests that evoking feelings in the classroom is determinant for students’ engagement, the emotions generated among students during their interactions should also be considered when designing novel classroom activities. As all participants described, most multiplayer games are designed around the concept of players’ interaction and the engaging strategies they utilize should be considered in academic settings.

Another important socially related factor concerned participants’ need to stand out amongst others and be recognized. Games enjoyed by participants allowed them to progressively develop skills, provided prominent ways to compare their performance with others, and facilitated their ability to alter the collective outcome. Standing out in a group of players by having the highest score, carrying the team to victory, or displaying a higher level of skill, was found to be an indicator of flow that influenced participants’ engagement and immersion.

In the traditional classroom, the most predominant measure of progress and success is given in the form of a standard grade. While conventional grades are required in our educational system, they lack multidimensional aspects present in other methods. For example, utilizing levels, experience points, and badges to indicate advancement not only serves to measure progress, but also can generate feelings of pride and satisfaction in students, something that in turn can motivate them to pursue the next challenge (Kingsley & Grabner-Hagen, 2015). Therefore, gamification is a strategy that should be seriously considered when designing academic activities aiming to increase students’ engagement in the modern classroom.

Although all participants remarked the importance of having a balance between competition and collaboration, actively competing towards a goal was a socially related motivational factor that seemed to carry a more significant weight. This finding is consistent with participants’ expressed needs for attention, recognition, and relevance. Collaboration was
also prominently mentioned by participants, but always in a competitive context.

This study found students were more likely to be engaged in activities that involved social interaction and a balance not only between challenge and skill, but also between competition and collaboration. Being able to stand out and aid others were social aspects that provided participants intangible rewards and a source of extrinsic motivation, while having more freedom and power was of extreme importance. Experiences able to provide ways to communicate, establish relationships of trust and friendship, compete, and collaborate were described by participants as part of their ideal vision of the classroom. Justin was particularly eloquent when recounting the importance of collaborating in competitive academic activities to achieve personal growth and learning. He stated,

- Competition is good because you must give the best of yourself to win your opponents.
- Collaboration is also good because it is good to be part of the collective, to help others.
- That makes you grow as a person. Your humility. And like I said, competition is also good. For example, if there is a classroom competition, to know which team is better you have to find valuable information when trying to be the best. That makes you better, because it involves you more in the subject that you need to discuss in class. That helps you.

In order to increase students’ engagement in the modern classroom, it is important to create a competitive and collaborative classroom environment where challenges originate not only directly from activities, but also indirectly from competition. The competitive and collaborative characteristics of some games are something that should be considered when designing academic activities. These activities must incorporate not only appropriate challenges, but also ways to compare students’ progress, compete, and collaborate towards a common and
significant goal.

The natural emergence of leadership skills in participants was an additional social characteristic of games that was discovered from the analysis of the interviews. While participants expressed being immersed in games that were competitive, when high skill and challenge meet in a competitive-collaborative setting, the desire to win often led participants to take charge of gaming groups and situations, something that unconsciously promoted their leadership skills.

The modern classroom should incorporate teamwork activities designed to foster the emergence of leadership skills, similarly to how certain multiplayer games do, while placing students in competitive environments highly focused on recognition and the constant build-up of new abilities required to succeed in subsequent tasks.

Communication between players and means to create real friendships was of special importance for participants and has important ramifications. Contrary to the stereotypical image that considers avid video-gamers as introverted individuals seeking isolation, this study showed the strong need of gamers to communicate and play as a social activity rather than an individual one. While social interaction frequently takes places virtually in games, participants expressed actively seeking to play with physically present individuals whenever possible. This was true not only for participants that had easy access to multiplayer games and the internet, but also for Justin, who didn’t have internet access in Cuba nor easy accessibility to the newest multiplayer games. For all participants, certain games were seen as opportunities to create meaningful friendships, communicate, and share experiences, things that were vital engagement factors.

Similarly to how is done in certain games, the modern classroom must allow and encourage relationships of trust and friendship among students by using activities that focus on
participation, communication, and the development of interpersonal skills.

Part of the engaging quality of certain games discussed by participants was found to be their ability to place players at the center of their gaming experience, something that made them feel special, valuable, and indispensable while providing them with a concrete set of objectives, rewards, and tools in an immersive, social, and open environment. Participants’ socially related needs for freedom, control, and power in games were interpreted as their desire to take control of their learning experience and having the opportunity to make a difference in their own academic path without confronting unbendable rules. Engagement can be increased in the modern classroom by providing students with a wider variety of choices in terms of assignments and academic activities. This should be done in a more socially competitive and collaborative environment that is open and flexible. Educational games and gamified activities create immersive environments that are simultaneously social, competitive, collaborative, and challenging, making them an ideal choice for teaching and learning.

This analysis was found to be in accordance to existing literature supporting active learning and a student-centered classroom where learning experiences are focused on students’ interactions and activities rather than the teacher or traditional lectures (Crumly, 2014; Granger et al., 2012; Moura & Van Hattum-Janssen, 2011).

**Implications: Teaching, Learning, and the Teachers’ Role**

The analysis of the data confirmed this study’s initial assumptions on the importance of teachers in the learning process and provided important insights on their ideal role as seen by participants.

Although participants described most of their current and past classes as traditional teacher-centric lectures, when asked about how they envisioned the ideal classroom, they clearly
expressed desiring an active-learning environment that placed students at the center of their learning. Participants also described their ideal professor as somebody that would serve as a guide, advisor, and facilitator rather than a simple lecturer or enforcer of academic rules.

When describing an engaging academic assignment, Marvin stated,

> It has to definitely be when I took ENC1101, the basic writing class that you have to take as a freshman in high school. I took it as a duel enrollment class. My teacher was a big gaming fanatic and I used to hang out with him after school a little bit and talk to him because we were both into gaming. He would assign essays and give everybody specific topics on areas to cover. He would kind of make me see how I can relate. Like how I could set the show in the Game of Thrones series and compare-contrast. Or turn it into a persuasive essay on how you should watch the show before the television tale and things like that. That right there already had my interest because it had two things that I liked and then he made me use it to progress in my academic.

> While professors in the modern classroom continue to be essential, their role should shift in favor of a more student-centered classroom. In this evolved role, professors must not only continue to be fully involved in the classroom, but also become facilitators rather than enforcers. They should place special attention to design activities that focus on the student and where the curriculum’s relevance is emphasized, creating favorable conditions so that students can relate and interact freely.

> While Marvin described preferring science and engineering courses, basing humanities assignments around his chosen interests not only engaged him, but also increased the effectiveness of his learning.

> The general disposition and professionalism of teachers were also desirable
characteristics that influenced students’ engagement and their disposition toward classes. For example, when asked about classes that were not engaging, Marvin expressed,

Only when it is a pointless class or when I see that the professors are very laid back and don’t care. They don’t want to be there. Are late all the time. It really depends on that. Because I don’t want to put the maximum effort for a teacher who is not going to reply to my emails, who is not going to help answering the question or answers with another question. Things like that.

The way students felt in the classroom was another engagement factor determined by a series of interrelated conditions of which professors played a fundamental part. For example, Edward recounted how teachers’ humor and appropriate language contributed to a good classroom experience while Megan commented on how flexible rules and communication created a more conducive learning environment. When talking about teachers’ roles in the classroom, she stated,

He is the one that can make the class fun or not. Some teachers are really strict, and you feel nervous to talk to them. You don’t even feel like talking to them. But if the teacher is nice and have discussions in class then you feel more relax and at ease. You feel like you can ask questions and stuff like that. I think that is very important for a good class.

The classroom dynamics described by all participants considered the professor a vital part of a series of engagement components and placed students at the center of the experience in an interactive environment that distanced itself from the quiet teacher-centric classroom described by Crumly (2014).

Participants’ views on the professors’ role clearly suggested the need to place them not only as motivators and leaders, but also as promoters of the material taught. In order to motivate
students and increase their engagement, professors of the modern classroom should constantly emphasize the importance and relevance of their teachings and use practical examples so that students can relate and immediately apply what they learned. Evan expressed how this could be accomplished by making sure the value of lessons was clearly understood. When commenting on the role of the teacher, Evan remarked, “With classrooms, what professors should learn to do is how to make students appreciate that knowledge. It is not so much about just memorizing something. It is about appreciating knowledge and the why”. Understanding the value of what was taught in class was closely related to its perceived real life applicability, something that will be discussed in the next section.

**Implications: Teaching, Learning, and the Real World**

When talking about learning, participants agreed on the need for academic assignments to be active while allowing greater control and freedom to construct their own learning experience. This study supports claims made by Shernoff, Csikszentmihalyi, Schneider, and Shernoff (2003) regarding students being more likely to be engaged when academic work is connected to real life problems and realistic consequences. In order for academic experiences to be effective, participants remarked the need for activities to be relevant and applicable to real-life. While participants expressed needing non-orthodox activities that offered engaging factors discussed throughout this study, they considered real-life applicability and relevance to be a requirement for teaching effectives. For example, when talking about her ideal classroom experience, Megan stated, “I think that we need more variety and different experiences as students that would help us to learn more practical stuff. Stuff that we can use”.

Participants expressed needing to understand real-life applicability of what was taught and reach a deeper state of learning that would allow them to truly value lessons. This could be
accomplished not only by emphasizing the real-life relevance of the curriculum, but also by choosing activities that students could relate to and associate with real-life applications directly or indirectly.

Participants’ descriptions of their ideal classroom experience brought to light a clear connection between real-life applicability and active-learning. While all participants expressed preferring classes that were active and contained hands-on projects rather than traditional lectures, they simultaneously expressed needing these activities to offer real-life applications. Marvin was expressive in this topic and remarked,

One class that I’m excited about is my civil engineering class. It’s going to obviously start in class explaining some basics and fundamentals, but it is going to take us out to the field testing soil, materials, learning what is stable and what is unstable, what we have to remove and put in. That’s because it is more hands on.

**Implications: Game Based Learning**

The analysis of participants’ gaming experiences not only revealed a clear correlation between games, engagement, motivation, and flow, but also produced valuable implications for teaching and learning. Participants’ recounts established their need to “learn by doing” instead of listening to lectures, something that is in agreement with constructivist learning theories and their emphasis to incorporate novel teaching and learning methodologies as remarked by M. Jong, J. Shang, F.-L. Lee, et al. (2008).

Participants were aware of the engagement qualities of certain games, their ability to produce moments of flow, and their teaching and learning potential. Although in different proportions, all participants recounted important learning outcomes produced by games and how these experiences contributed, tangibly or intangibly, to their lives.
Participants reported learning about a variety of topics using games. These included not only development of tangible skills like computer programming and configuration, social etiquette, and research, but also development of organizational and personality based traits like strategic thinking, problem-solving, perseverance, and leadership.

Although teaching and learning qualities of some games played by participants were not always evident, they acted as important tools that introduced and motivated them to learn about different topics. Simultaneously, games served as a central hub for communication and entertainment allowing participants to be immersed in engaging environments that produced moments of flow and learning.

Games’ engaging qualities together with their teaching and learning potential should be utilized in the higher education classroom. This could be accomplished by modifying existing games, creating new ones, and making games part of the academic curriculum. Academics should also consider incorporating points, levels, badges, letter boards, and other common gaming elements to existing classroom activities, something that has not yet received enough attention in higher education. Participants reported exposure to Game Based Learning in the college classroom to be extremely limited or non-existent, and clearly expressed needing more engaging activities in the classroom that incorporated factors that would create a more memorable experience, something that traditional lectures were not able to accomplish. For example, when Megan reflected about traditional lectures and games, she commented,

Like, who can remember stuff from a Power Point class? But, if you played a game that put you in a position where you had to know stuff or find out. You will remember that experience. You will remember how difficult it was, or how fun it was and what you learned. Something different from just listening to a lecture.
As it is accomplished by some games, the modern classroom must create memorable engaging experiences. For example, when reflecting on the most desirable factor needed for an ideal learning experience, Marvin stated, “Mainly personal experience because it is how the mind works. Personal experience really engages memory and it really helps progress in that. To keep it fresh in your mind”. Games’ immersive and highly interactive qualities are conducive to create memorable experiences and therefore should be considered when designing engaging academic activities.

Participants’ relationship with games since childhood was also a strong characteristic that influenced their attitude toward games and the way they were perceived in terms of value, importance, and engagement. Although participants also experienced a close relationship with academic activities, this relationship was different and had a substantial amount of negativity associated with it. While games were immediately associated with positive memories and moments of flow, classroom experiences were not and often involved feelings of frustration and discontent that could be associated with flow’s states of boredom, apathy, and anxiety as described by Csikszentmihalyi (1997).

Simultaneously, certain games were able to constantly produce what this study calls as the “learning circle” where intrinsic and extrinsic motivational factors such as in-game points, levels, special in-game powers, and social recognition drove participants to improve their gaming skills by cyclically learning new content. This phenomenon was not present in participants’ recounts of their classroom experiences or in the analysis of the data. Material taught in a class was reported to be disconnected from other classes, in many cases not even necessary to progress, and normally lacking a sense of accomplishment, reward, or extrinsic motivation other than obtaining a passing grade. This lack of continuousness not only produced significantly less
moments of flow and engagement, but also contributed to the discontent felt by participants.

Finally, games’ evaluation of players’ skills through engaging activities that were interactive and shared, were reported as effective motivational contributors to the learning circle while traditional evaluations that used multiple-choice questions were considered oppressive, ineffective, and lacking in almost every aspect. When talking about his academic experiences and the ideal classroom, Evan comments were of special interest. He stated,

Well, more discussions, more interaction with us. Also, more practical projects instead of exams. Many classes just make you memorize a lot of stuff and then ask you to remember it in a multiple-choice exam. After that you just forget about it. It should not be like that. You should apply what you learn in a project or something more practical and relevant to your life, so you can remember it.

The modern classroom is in desperate need to utilize alternative evaluation methods that not only focus on quantifying students’ knowledge, but also possess social and competitive components similar to the ones found in games, something that would increase students’ engagement, motivation, and flow experiences.

Implications: Institutional Support and Faculty Development

The effective incorporation of games and novel teaching methodologies in the higher education classroom requires significant effort and support from educational institutions, faculty, and academics in general. While many games make use of tangible resources (computing devices, software, etc.), they also require modifications, careful planning, and evaluation in order to be used effectively as academic tools. Educational institutions should encourage faculty to use novel teaching methods such as GBL and gamification by increasing their awareness on the benefits and academic ramifications. Institutions and educators must collaborate in order to
create concrete guidelines, instructions, and common practices that can be used to incorporate these tools in the classroom.

Since incorporating novel teaching methodologies requires significant additional effort and work, it is vital that faculty willing to undertake this challenge is offered more tangible and intangible opportunities for professional development, recognition, and progression. Finally, it is important that academic institutions establish additional personnel to support faculty in the adoption of these novel methodologies. This is especially important for teaching tools and methods that require the use of computing hardware and software.

**Implications: Gaming Field**

Although the entertainment gaming industry continues to grow exponentially, more educational oriented games are necessary in order to facilitate their incorporation to the higher education classroom. Academic games not only need to retain their engaging qualities, but also need to be flexible and highly customizable in order to incorporate academic learning outcomes. Therefore, game designers need to create modifiable games that can be adapted and effectively used to teach a variety of subjects.

Although educational games are commonly seen in elementary and middle school environments, their rare use in higher education is something that needs to be addressed. The powerful engaging, teaching, and learning potential of games should be considered more seriously by academics and educational game designers. Simultaneously, the possible negative effects of games and their academic ramifications demand special attention and consideration. More studies are needed to determine how games and gamification can be incorporated effectively in the higher education classroom.
Conclusions and Recommendations for Further Research

The analysis of college students’ gaming and academic activities identified a series of important factors that, if adequately implemented, would bring a series of benefits to the classroom experience. This study’s findings suggest that classroom activities should not only be dynamic and entertaining, but also relevant, practical, competitive, and social. In order to increase students’ engagement, it was found that academic activities should give enough freedom of choice and tools to keep track of students’ progress while creating a dynamic social environment where students can interact, compete, collaborate, and share their experiences.

Based on this study’s analysis, activities should be designed as active interconnected experiences that place students at the center of their learning while the instructor provides guidance and assistance in the process. Generating moments of flow was found to be critical to create memorable and effective experiences not only in games, but also in academic activities, something that should be studied and considered when designing these activities.

The analysis of participants’ gaming and academic activities pointed out a variety of engaging factors the typical classroom experience lacks, but that are abundantly present in certain games. Transporting these factors to the classroom in the form of positive and memorable experiences, like certain games can do, was something participants were eager to see in their academic activities.

While many factors found in this study could be implemented in the classroom using a variety of teaching and learning methods, utilizing inherently engaging characteristics of certain games and their established relationship with students was found to be a logical and clear choice in order to bring substantial academic benefits as supported by other studies (A. Huang & Levinson, 2012; Mayo, 2009; Neef et al., 2011; Rosser et al., 2007).
This study suggests that future research on GBL and Gamification should explore linkages between games and academic success in postsecondary education and ways to effectively incorporate games in the higher educational classroom. Although this study found evidence of games’ teaching and learning potential and their influence in college students’ engagement, more studies are needed in order to design academic experiences that incorporate gaming benefits while minimizing the risk of addiction and other negative related aspects. While it would be important to facilitate the production of easily adaptable gaming tools that could be adjusted to a variety of postsecondary classroom learning objectives and circumstances, more studies are required to better understand the engaging qualities of games and their place in postsecondary education. In order to accomplish this, an increase in collaboration between game designers, K12 teachers, higher education faculty, and researchers is required.
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doi:10.1088/0031-9120/44/5/004


Appendices

Appendix A: Participation Recruitment Add

Northeastern University, College of Professional Studies
Doctoral Student Researcher: Sergio Pisano

Title of Project: Students’ Gaming Experiences with Games and Their Academic Potential: An Interpretative Phenomenological Analysis
Participation Recruitment Add

Dear Students,

I am a doctoral student at Northeastern University undertaking a research study entitled “Students’ Gaming Experiences and Their Academic Potential: An Interpretative Phenomenological Analysis”. In this study, I am asking college students, selected through a brief survey pool, to engage in an interview regarding experiences with peak engagement in games and in academic activities. It is estimated that 5 to 7 students will meet the criteria for inclusion.

I will only include participants who consent to the study, are 18 years old or older, and self-identify as current college students at any American academic institution. Students have no obligation to participate and are free to withdraw at any time. Students’ self-identifying information will not be disclosed in the study.

Although there will be no direct benefit for taking part in the study, the information learned may help educators better understand and promote student engagement.

If you would like to volunteer to participate, or you have any questions about this study, please feel free to contact me at pisano.s@husky.neu.edu.

Thank you,

Sergio Pisano

IRB# CPS17-09-08
Approved: 10/24/17
Expiration Date: 10/23/18
Appendix B: Preliminary Questionnaire

Northeastern University, College of Professional Studies
Docoral Student Researcher: Sergio Pisano
Title of Project: Students’ Gaming Experiences and Their Academic Potential: An Interpretative Phenomenological Analysis
Preliminary Questionnaire and Consent Form

Dear student,

My name is Sergio Pisano, I am currently a doctoral student at Northeastern University and I am seeking participants for a study entitled Students’ Gaming Experiences and Their Academic Potential: An Interpretative Phenomenological Analysis. Through this study, I aim to learn more about students’ experiences with games and their engaging potential in academic activities.

I am inviting you to complete an online survey. This survey will help me to determine which students best meet the study criteria to move on to an interview.

If you would like to complete this survey, please read carefully the following information and provide your consent to participate in this study.

If you have any questions, you can email me at pisano.s@husky.neu.edu

This study has been approved by Northeastern University IRB (CPS17-09-08) using only University approved websites.

IRB# CPS17-09-08
Approved: 10/24/17
Expiration Date: 10/23/18
1. Are you currently 18 years old or older?
   Yes No

2. Are you currently a college student in the United States?
   Yes No

3. How often do you typically play non-electronic or electronic (any platform) games?
   Daily Weekly Monthly Rarely Never

4. I often experience a feeling of being “in the zone” or highly engaged in certain games
   Strongly Disagree Disagree Neutral Agree Strongly Agree

5. I often experience a feeling of being “in the zone” or highly engaged in certain school activities or classes.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

   During these highly engaging experiences,

6. ... My attention is in focus and I am immersed in the activity.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

7. ... I tend to lose the sense of time (time seems to pass faster or with my awareness).
   Strongly Disagree Disagree Neutral Agree Strongly Agree

8. ... I feel in control.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

9. ... I do not feel self-conscious.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

10. ... I have a sense of accomplishment and I am aware of my actions.
    Strongly Disagree Disagree Neutral Agree Strongly Agree

Please provide the following contact information,

Name: ___________________ Phone Number: ___________________

E-mail: ___________________

IREB# CPS17-009-08
Approved: 10/24/17
Expiration Date: 10/23/18
Appendix C: Telephone Contact Script

Northeastern University, College of Professional Studies
Doctoral Student Researcher: Sergio Pisano
Title of Project: Students’ Gaming Experiences and Their Academic Potential: An Interpretative Phenomenological Analysis

Telephone Contact Script

Hello, my name is Sergio Pisano. I am a doctoral student at Northeastern University undertaking a research study entitled “Students’ Gaming Experiences and Their Academic Potential: An Interpretative Phenomenological Analysis”. I am contacting you because of your interest in participating in this study and the qualifying results obtained from your questionnaire’s answers. Is this a good time to talk?

Great. First, I would like to confirm that you are 18 years old or older and a current college student at any American academic institution. Is this information correct?

Thank you. Please remember that you have no obligation to participate and are free to withdraw at any time. Your confidentiality and privacy will be kept at all times and your identity or any self-identifiable information will not be known to anyone with the exception of the researchers and, potentially, authorized personnel.

Furthermore, there are no foreseeable risks, harms, discomforts or inconvenience anticipated for participants. All the data collected from this study will be kept in an encrypted drive until the end of the study when it will be destroyed with the exception of the consent documents which will be kept for 7 years. Furthermore, although there will be no direct benefit for taking part in the study, the information learned may help educators better understand and promote student engagement and academic success.

I would like to schedule an interview with you at a time and place of your preference. Please keep in mind that the interview will last approximately 60 to 75 minutes. Do you have any questions?

Excellent. I will see you at the established time and place. If you have any further questions before our interview, you can contact Dr. Afif Wiggins, the Principal Investigator, at a.wiggins@northeastern.edu, or me at pisano.s@husky.neu.edu.

Thank you for your participation,

Sergio Pisano

IRB# CPS17-09-08
Approved: 10/24/17
Expiration Date: 10/23/18
Appendix D: Informed Consent Form

Northeastern University, College of Professional Studies
Principal Investigator: Dr. Afi Wiggins, Student Researcher, Sergio Pitaño
Title of Project: Students' Gaming Experiences and Their Academic Potential: An Interpretable Phenomenological Analysis

Informed Consent to Participate in a Research Study

We are inviting you to take part in a research study. Feel free to ask the researcher any questions that you have. When you are ready to make a decision, you may tell the researcher if you want to participate or not. You do not have to participate if you do not want to. If you decide to participate, the researcher will ask you to sign this statement and will give you a copy to keep.

Why am I being asked to take part in this research study?
Your participation is being invited since it may produce valuable results for educators seeking to create a more student-centered learning environment, facilitate active learning, and increase students' engagement.

Why is this research study being done?
The intention of this study is to explore the peak experiences of students in games and provide means by which educators can increase and promote such experiences in academic activities.

What will participants be asked to do?
The researcher will conduct a 60-75 minutes interview scheduled at a mutually convenient time and location with each participant. This interview may be conducted in-person, over the phone, or online according to the participants' preference.

Will there be any risk or discomfort to me?
There are no foreseeable risks, harms, discomforts or inconvenience (beyond that of the single interview) anticipated for participants.

Will I benefit by being in this research?
There will be no direct benefit to you for taking part in the study. However, the information learned from this study may help educators better understand and promote students' engagement.

Who will see the information about me?
Your identity as a participant in this study will not be known to anyone with the exception of the researchers and, potentially, authorized personnel. In rare instances, authorized people may request to see research information about you and other people in this study. This is done only to be sure that the research is done properly. We would only permit people who are authorized by organizations such as Northeastern University Institutional Review Board (or if applicable the sponsor or funding agency e.g. NIH, NSF, FDA, CHEF) to see this information. Also, as a teacher, your researcher is a mandated reporter and is responsible for reporting to administrators any concerns for your safety or well-being.

Pseudonyms will be used to increase anonymity. No reports or publications will use information that can identify you in any way or any individual as being of this project. Audio recordings will be destroyed at the conclusion of the study.

Can I stop my participation in this study?
Your participation in this research is completely voluntary. You do not have to participate if you do not want to and you can refuse to answer any question. Even if you begin the study, you may quit at any time. If you do not participate or if you decide to quit, you will not lose any rights, benefits, or services that you would otherwise have as a student.

Who can I contact if I have questions or problems?

IRE# CPS17-09-08
Approved: 10/24/17
Expiry Date: 10/23/18
If you have any questions about this study, please feel free to contact Sergio Fisano, the person mainly responsible for the research, at fisano.s@husky.neu.edu. You can also contact Dr. Ali Wiggins, the Principal Investigator, at wiggins@northeastern.edu.

**Who can I contact about my rights as a participant?**

If you have any questions about your rights in this research, you may contact Nan C. Regina, Director, Human Subject Research Protection, Mail Stop: 560-177, 560 Huntington Avenue, Northeastern University, Boston, MA 02115. Tel: 617.373.4588, Email: n.regina@neu.edu.

You may call anonymously if you wish.

**Will I be paid for my participation?**

Participants will not be paid for their participation.

**Will it cost me anything to participate?**

It will cost participants nothing to participate.

I agree to take part in this research.

__________________________________________________________  ________________________
Signature of person agreeing to take part                    Date

__________________________________________________________
Printed name of person above

__________________________________________________________  ________________________
Signature of person who explained the study to the participant above and obtained consent                    Date

Printed name of person above
Appendix E: Interview Protocol

Greetings, you have been selected to speak with me today because you have been identified as someone who has a great deal to share about gaming experiences. My research project focuses on understanding students’ experiences in the context of engagement and learning. Through this study, we hope to gain more insight into the teaching and learning potential of games. I hope that this will allow us to identify ways in which we can increase students’ engagement. Because your responses are important and I want to make sure to capture everything you say, I would like to audio tape our conversation today. Do I have your permission to record this interview? [If yes, thank the participant, let them know you may ask the question again as you start recording, and then turn on the recording equipment]. I will also be taking written notes. I can assure you that all responses will be confidential and only a pseudonym will be used when quoting from the transcripts. I will be the only one privy to the tapes, which will be eventually destroyed after they are transcribed. To meet our human subject’s requirements at the university, you must sign the form I have with me [Appendix D]. Essentially, this document states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) we do not intend to inflict any harm. Do you have any questions about the interview process or how your data will be used? Very well. This interview should last between 60 to 75 minutes. During this time, I have several questions that I would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning. Do you have any questions at this time? Excellent. If there are no more questions, we will start.
Appendix F: Interview Schedule

- Please introduce yourself and tell me a little about your life as a student.
  - Possible follow-up: What are you currently studying?
  - Possible follow-up: Why have you chosen that line of study?
  - Possible follow-up: What are your favorite activities or hobbies outside of the classroom?

- Describe your relationship with games and gaming in general.
  - Possible follow-up: Describe how you got involved with games and why you play.
  - Possible follow-up: Describe the type of games that you most enjoy.
  - Possible follow-up: Describe the environment and location where you usually play.
  - Possible follow-up: Describe the process of playing one of these games.

- Describe your experience when playing games that you enjoy.
  - Possible follow-up: What are the specific aspects that you like about these games?
  - Possible follow-up: How does your experience playing your favorite type of games compare to the ones you like the least?
  - Possible follow-up: Describe a specific time when you felt engaged in a game.
  - Possible follow-up: How do you know you were deeply engaged?
  - Possible follow-up: Can you describe how you feel after and before these experiences?

- How have these gaming experiences contributed to your learning and personal development?
  - Possible follow-up: Do you prefer games that are easy from the beginning or harder and why?
  - Possible follow-up: How do you feel and what do you do when you do not know how to solve a problem in a game?

- Can you describe an instance in the classroom when you felt fully engaged and immersed in an academic activity?
  - Possible follow-up: Describe your feelings during and after such experience.
  - Possible follow-up: What factors contributed to this positive experience? (The
activity itself, environment, teacher, peers, etc.)

- Possible follow-up: How does these experiences compare to a time when you felt disengaged or uninvolved in the classroom?

- How would you describe your experiences with games in the classroom?
  - Possible follow-up: Which specific game elements and activities would be most important to incorporate in the classroom in order to increase engagement?
  - Possible follow-up: How do you feel about collaborating versus competing in classroom games?

- In general, how do you envision the perfect classroom experience (in terms of engagement)?

- Is there anything else you would like to share about these experiences?
Appendix G: Figures

Figure G1: The four channels model of flow. Adapted from *Beyond boredom and anxiety* (p. 49), by M. Csikszentmihalyi, 1975, San Francisco: San Francisco.

Appendix H: Unsigned Consent Document for Web-based Online Surveys

UNSIGNED CONSENT DOCUMENT FOR WEB-BASED ONLINE SURVEYS

Northeastern University, Department of:
Name of Investigator(s): Principal Investigator, Dr. Al Wiggins. Student Researcher, Sergio Pisano
Title of Project: Students' Experiences with Games and Their Academic Potential: An Interpretative Phenomenological Analysis

Request to Participate in Research
We would like to invite you to participate in a web-based online survey. The survey is part of a research study whose purpose is to explore the peak experiences of students in games and provide means by which educators can increase and promote such experiences in academic activities. This survey should take about 5 minutes to complete.

We are asking you to participate in this study because your participation may produce valuable results for educators seeking to create a more student-centered learning environment, facilitate active learning, and increase students' engagement. You must be at least 18 years old to take this survey.

The decision to participate in this research project is voluntary. You do not have to participate and you can refuse to answer any question. Even if you begin the web-based online survey, you can stop at any time.

There are no foreseeable risks or discomforts to you for taking part in this study.

There are no direct benefits to you from participating in this study. However, your responses may help us learn more about gaming experiences and students' engagement.

You will not be paid for your participation in this study.

Your part in this study will be handled in a confidential manner. Any reports or publications based on this research will use only group data and will not identify you or any individual as being affiliated with this project.

If you have any questions regarding electronic privacy, please feel free to contact Mark Nardone, NU's Director of Information Security via phone at 617-373-7901, or via email at priv@neau.edu.

If you have any questions about this study, please feel free to contact Dr. Al Wiggins, the Principal Investigator, at awiggins@northeastern.edu, or me at pisano@tibra.com.

If you have any questions regarding your rights as a research participant, please contact Nan C. Regina, Director, Human Subject Research Protection, 900 Renaissance Park, Northeastern University, Boston, MA 021155. Tel: 617-373-4565. Email: nregina@neu.edu. You may call anonymously if you wish.

By clicking on the "I consent" button below, you are indicating that you consent to participate in this study. Please print out a copy of this consent form for your records.

Thank you for your time.

Sergio Pisano.

IRB# CP317.09.00
Approved: 10/24/17
Expiration Date: 10/23/18
Appendix I: Notification of IRB Action

Northeastern

Notification of IRB Action

Date: October 24, 2017
IRB #: CPS17-09-08

Principal Investigator(s): Afi Wiggins
Sergio Pisano

Department: Doctor of Education
College of Professional Studies

Address: 20 Belvidere
Northeastern University

Title of Project: Students’ Experiences with Games and Their Academic Potential: An Interpretative Phenomenological Analysis

Participating Sites: N/A

Informed Consent: One (1) unsigned consent for surveys
One (1) signed consent for face-to-face interviews

DHHS Review Category: Expedited #6, #7
Monitoring Interval: 12 months

Approval Expiration Date: OCTOBER 23, 2018

Investigator’s Responsibilities:
1. Informed consent forms bearing the IRB approval stamp must be used when recruiting participants into the study.
2. The investigator must notify IRB immediately of unexpected adverse reactions, or new information that may alter our perception of the benefit-risk ratio.
3. Study procedures and files are subject to audit any time.
4. Any modifications of the protocol or the informed consent as the study progresses must be reviewed and approved by this committee prior to being instituted.
5. Continuing Review Approval for the proposal should be requested at least one month prior to the expiration date above.
6. This approval applies to the protection of human subjects only. It does not apply to any other university approvals that may be necessary.

C. Randall Colvin, Ph.D., Chair
Northeastern University Institutional Review Board

Nan C. Regina, Director
Human Subject Research Protection

Northeastern University FWA #4630
Appendix J: Resulting Codes and Themes from Data Analysis

Table 1

**Resulting Codes and Themes from Data Analysis**

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