GAME ON: A QUALITATIVE CASE STUDY ON THE EFFECTS OF GAMIFIED CURRICULUM DESIGN ON STUDENT MOTIVATIONAL LEARNING HABITS

by

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A dissertation submitted to the faculty of Robert Morris University in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Instructional Management and Leadership

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Abstract

With an increased need for differentiation and more rigorous, authentic forms of education, Gamification has emerged as a paradigm for designing and implementing instruction in multiple disciplines (Gee, 2003). Gamification uses game attributes such as play, narrative, interactivity, and collaboration, in conjunction with motivational game elements such as awards, freedom to fail, tiered difficulty, and choice in order to motivate the "player" to complete tasks and engage in content. While game elements have been a part of advertising and education for decades, only recently have they become an area of interest for course design (Kapp, 2012). This qualitative case study sought to identify the effects of a Gamified English course on student Self-Determination, Self-Efficacy, and Self-Regulation, as well as understand student perceptions of learning in a Gamified environment. Students in a senior level English class were instructed using a Gamified curriculum for an entire school year and then interviewed and observed to gain insight into their dispositions towards Gamified learning in education. Additionally, assignment-completion data was collected from the course learning management system, "3D GameLab". Results found universal increases in Self-Efficacy, gains in Self-Determination among students with previously high and low motivation, and magnification of existing Self-Regulation habits for all students. Additionally, the students found overall positive perceptions specifically regarding personalized learning technologies. Gamification served to magnify existing learning habits, and empowered students to solve complex problems without direct instruction. Suggested follow-up research includes implementing Gamification systems with stronger narrative embedded into course design, and more varied subjects and grade levels.

Chapter I: Introduction

Contextual Background

While past practice is filled with attempts to revolutionize education with technology, it has often failed to change any fundamental educational paradigms (Romiszowski, 2004; Charsky, 2010). Many classes still find students sitting in rows, taking lecture notes, and submitting worksheets. The increased use of standardized tests has led to a revitalized behaviorist model as quarterly exams and high-stakes testing have narrowed curricula to "formulaic writing devoid of communicative purposes; comprehension of decontextualized reading passages; canonical literature; and decontextualized conventions for grammar, usage, and mechanics" (Brass 2008, p. 472). The absence of culture and context can be a key reason for lack of motivation in coursework which students find to be irrelevant and lacking in meaningful feedback (Barab, 2009; Dweck, 1986; Eccles & Wingfield, 2002). Conversely, video games have proven to be one of the most motivational developments in the past few decades (Haskell, 2012). With an increased focus on the need for technology-infused instruction, many different options exist for enticing and challenging students to work and succeed autonomously.

One field, which has proven to be highly motivational in recent decades, is the video game industry. Video games, when used in an educational setting have been found to be extremely motivating as they offer students the opportunity for choice, exploration, and rewards (Haskell, 2012). In addition, the possible incorporation of narrative structures and long-term objectives, as well as short-term tasks and quests, are motivating

to students (Chatfield, 2010). The use of the video game elements in a traditional class setting is a growing movement in education called Gamification or Gamified Learning.

In its simplest definition, Gamification is *"*the use of game design elements in non-game contexts" (Erenli, 2013, p.15). For decades, retailers have used these techniques in order to manipulate behavior with rewards cards, frequent flyer miles, and discount days. Other examples of game techniques include the "freedom to fail" and storytelling (Kapp, 2012). Narrative structures in video games provide an immersive experience while the "freedom to fail" encourages the player to multiple attempts to complete a task. This freedom encourages innovation, as the fear of making a mistake is minimized. These elements represent a transition from traditional classroom mechanics in which an assessment is often a one-time attempt leading to high stakes and anxiety with little chance for improvement. In Gamification, the instructor is compelled to design the curriculum and lesson structure as a "game" in which students are completely engaged in the environment and compelled to take ownership of the learning (Chang, 2010). Gamification is not the act playing educational computer games nor merely altering verbiage in order to give the illusion of "gameplay" in the traditional behaviorist setting; it is a fundamental restructuring of the classroom.

Many of the mechanics in Gamified learning are based on Role-Playing Games such as *World of Warcraft* or other popular brands. These share a number of common features including "Leaderboards, Badges, Level Systems, Achievements […] and Rewards" (Erenli, 2013, p. 17). In a Gamified classroom, students must begin as novices and earn the right to complete the challenges and complete the course. Students complete assignments, challenges, and task collaboratively in order to gain knowledge needed to

"fight the boss" (i.e. take the final exam/paper of the unit). By defeating the final project at an 80% (or another pre-determined value) or higher, students demonstrate mastery and are permitted to move forward. Failure to achieve this mark does not mean a low grade, merely that students have not yet mastered the content and must redo or improve the assignment. As a result, the emphasis shifts from avoiding mistakes to learning. Students are motivated to do well in order to finish the course, and students have the added benefit of working collaboratively in order to complete tasks. While each Gamified classroom is different, some may use technology heavily, others may be paper-based, as they follow these basic concepts. Though Gamification is a more contemporary term in education, it has solid foundations in many existing educational paradigms such as project based learning, learning for mastery, collaboration and other educational paradigms (Haskell, 2012; Foreman; 2004, Bergman, 2012).

While Gamification is currently a rising trend in education, there is little research on the full effect of a Gamified course, specifically in the area of student learning habits and motivation. Teachers have only begun to implement small elements and it remains unclear if a full shift to a technology-centered, project-driven, Gamified curriculum design will lead to a change in student progress (Van Eck, 2011).

Statement of the Problem

This study sought to examine the effects of a Gamified learning curriculum design on student learning habits including motivation, and self-efficacy. Currently, there is not much information on how elements of a Gamified curriculum can influence the student experience. Despite a rise in game-based mechanics, there is little research to validate its effectiveness, especially in subject areas beyond math and science (Van Eck, 2011).

While there is considerable anecdotal evidence for the inclusion of such methods, there have been few studies specifically designed to prove if it the program is successful (Chee, 2012, Erenli, 2013, Goodwin, 2013, Sams, 2013). The combination of a digitized curriculum in the English classroom, the incorporation for project-based learning, and a shift to a Gamified, mastery-grading structure were qualitatively described based on student perception. The main goal was to explore what changes, if any, the Gamified model has on student learning and working habits. The guiding problem statement was "What effect does the use of a Gamified curriculum in a high school English classroom have on student motivation and learning habits?"

Research Questions

The project examined the effects of the Gamified Learning on student motivational learning habits. In particular, the study sought to understand how the Gamified model affects student actions and well as their perceptions and dispositions. Bandura (2003) saw motivation (Self-Determination) as a clear indication of academic success as well as student's ability to execute tasks autonomously (Self-Regulation) and his/her confidence in ability to complete the task (Self-Efficacy). This work is further supported by Van Nuland (2012)'s Self-Determination theory. This study sought to learn the following questions:

1. What effect does a Gamified curriculum have on student motivational learning habits including Self-Determination, Self-Regulation, and Self-Efficacy?
2. What are the students' perceptions and dispositions towards the use of Gamified learning in their classroom experience?

Definitions

This study contains several uncommon terms (Gamification, Enactivism) as well as common terms (Play, Self-Determination, Self-Regulation, Self-Efficacy), which have broad and flexible definitions. This section clarifies these terms' role in this study.

Gamification or Gamified Learning

Gamification is similar but not to be confused with game theory: "a method of analysis as an important tool in economics, political science, law, social psychology, and other disciplines (Shubik, 2012). More simply, "Gamification is the use of game design elements in non-game contexts" (Erenli 15). Gamification uses a number of game elements including the "freedom to fail" and "storytelling" (Kapp, p. 2012, p. 67). Some further examples of both online and offline game elements in education include "Leaderboards, Badges, Level Systems, Achievements, Rewards, Geolocation Services" (Erenli, 2012, p. 17). These elements represent one end of the Gamification spectrum while others take the experience to a far more immersive level. Some more advanced game elements include "sophisticated story lines, graphics, graduated levels of play and problem solving mechanisms […] these are some of the underlying attributes that have been shown to be linked to the attraction to video gaming" (Mellecker, 2012, p. 52). The primary function of Gamified learning is to invoke game-elements, which may lead to an increase in student motivation, play, Self-Efficacy, and higher-level thinking. "In summary, instructors can build a pleasant environment through games, whereas students can achieve a sense of victory through games; therefore, changes, challenges and fun can characterize the entire learning process, and this is the main reason for games' appeal to

students" (Chang 322).

Play

A key component to the role of the games is the function of play. Gameplay is the most important element of game design as without a solid game design, the rest of the experience will fail (Manusos, 2013). The experience refers not only to the action of progressing through the game, but the enjoyment derived and the overall ease of use. In any game, fidelity is not nearly as important as usability, hence playability is more important (Rooney, 2012). This explains the popularity of games such as *Angry Birds* or *Pac-Man*, which, while lacking in powerful graphics or narrative posses a simple, and possibly addictive, user interface. Another interesting example was provided by who explain that gameplay is increasingly part of "what it means to be literate in the 21st century" (Felicia, 2012, p. 6). Not only are games notable tools but also the action of play mirrors that of traditional academic endeavors in many cases. Much like the learning process, a game scaffolds players from simple to difficult tasks as they build on existing skills in order to tackle new challenges.

Self-Determination

Synonymous with "motivation", Self-Determination is a goal-directed mindset, which compels a student to accomplish tasks (Van Nuland, 2012). Self-Determination can be internal or external, as well as positive or negative in nature. This study will focus primarily on students' intrinsic Self-Determination, as external motivators are ultimately more fleeting.

Self-Efficacy

A student's perception of his/her own abilities and disposition towards a task, tool, or content. These perceptions consequently affect the student's performance either positively or negatively (Bandura, 1997).

Self-Regulation

Self-Regulation is a strategic behavior by students to systematically and deliberately accomplish a task including rehearsal, elaboration, organization, and critical thinking (Sadi, 2013). The demonstration of self-regulated learning strategies acts as a bridge between Self-Determination/Self-Efficacy and the realization of academic goals.

Enactivism

A learning theory, which combines elements of behaviorism and constructivism, Enactivism believes that the human mind, body, and world are inseparable. In this scenario, learning takes place through the learner's acts and learners interact with objects and events. Enactivism strongly aligns with Gamification's model of creating an immersive learning environment (Li, 2013). This term is explored more heavily in Chapter II as a departure from the traditional constructivism/behaviorism dichotomy.

Statement of Purpose

As education has become an increasingly valuable commodity in a competitive economic landscape, Gamified learning offers more than new content knowledge. The current educational system, while effective for many students, focuses primarily on academic career paths specializing in reading, arithmetic, and other classical intellectual pursuits (Bergman, 2012). These are certainly valid fields yet they are by no means all

encompassing. Even so, education has a responsibility to serve students of diverse backgrounds and multiple learning styles.

Furthermore, the current educational system has several weaknesses including lack of collaboration, stigmatization of failure, ignorance of technology, and lack of mastery (Durley, 2012). As a result, the skills required to earn high grades are not always indicative of the ability to learn and internalize information. Advancing students to more difficult material without first ensuring mastery of key content can easily lead to frustration. Just as learning the skill of addition is essential before mastering multiplication; the majority of education is cumulative in nature and requires a solid foundation before advancement. By continually pushing students to the next year due to their age, the education system does them a disservice, which is rarely corrected (Guskey, 2007).

Gamification is a method of curriculum designed and instructional delivery addresses many of these current educational inadequacies to be addressed. By creating an immersive world in which students are able to solve real-world problems and use information in an authentic (not merely academic) manner, Gamification can allow for increased knowledge retention and enthusiasm (Amory, 2012; Erenli, 2013). This study sought to examine student perceptions of Gamified learning, as well as its effect on motivation and behavior.

Assumptions

The study followed fourteen students from a class of thirty over a course of a nine-week grading period to conduct a qualitative analysis on the students' dispositions, reactions, and adjustments to the system. All students read the same texts and completed

the same large assignments with variations only in content delivery, grading, and use of instructional technology. Prior to the study, students had been enrolled for six months.

Theoretical Background

This study's theoretical framework behind this study is the importance of motivation, manifested through Self-Determination, Self-Regulation, and Self-Efficacy, on academic achievement (Bandura, 1981; 1992). The value in researching student learning behaviors, perceptions, and dispositions lies in the link between high levels of student motivation and academic performance (Bandura, 1992; Jackson, 2013). Games' built-in reward systems are highly motivating; players succeed, motivated by rewards, which causes them to play more and the cycle continues (Hamlen, 2013; Hammer, 2013). In simplest terms, motivation is the creation of interest and creating a scenario in which the student has something they want to do (Tamim, 2013, Wolters, 1998).

Additionally, student success, both academically and social, lies in a cultural and contextual awareness, both qualities found in games (Bandura, 2003; Plass, 2013). Bandura (1992)'s work demonstrates the importance of a student's ability to self-regulate, combined with external influences, which will affect Self-Efficacy. Additionally, Bandura (1999, 2001, 2002, 2003) focuses on the importance of social functioning, agency, information technology, and goal setting as valuable tools in the human experience. While each of these factors is large enough to create its own study, his body of work closely aligns with the research and advantages behind Gamified learning. Chapter 2 explores in more detail Bandura's research not only on academic success through motivation, but the importance of using technology to mold socially responsible, collaborative individuals (Bandura, 2002).

Other research (Pintrich, 1991; Klein, 2006) indicates that motivation to learn is a robust predictor of course outcomes and is influenced by both individual and situational characteristics. Motivation arises from the development of two forms of interest: Individual and Situational Interest. "*Individual interest* refers to an intrinsic desire and tendency to engage in particular ideas, content, and activities over time […] *Situational interest*, in contrast, refers to the attention and affective reactions elicited by the environment" (Plass, 2013, p. 1054). Individual interest is interchangeable with Self-Efficacy but the situational interest is often the first and most pressing early motivator, which "leads to the development of individual interest" (Plass, 2013). Game elements offer an initial situational interest through elements of achievement, immersion, and escapism (Haskell, 2012). For example, one of the motivational elements of games is "the individual and personalized nature of the interactions that adapt to the skills and actions of the player" (Jackson, 2013, p. 1037). Other research has isolated various mechanisms common to games, such as feedback, incentives, task difficulty, and control, have a significant impact on motivational constructs which may ultimately affect learning (Jackson, 2013, p. 1037). The collaborative, creative project-based nature of Gamified learning assessment also taps into the second dimension of motivation, focusing on whether the target of such motivation is self-oriented or other-oriented (Forgeard, 2013).

Self-Efficacy is another factor in motivation (Bandura, 1997). There is a clear relationship between academic achievement and disposition as knowledge and beliefs as "self-efficacy judgments specifically refer to future functioning and are assessed before students perform the relevant activities. This antecedent property positions self-efficacy judgments to play a causal role in academic motivation" (Zimmerman, 2000, p. 84).

Student motivation increases as students gain insight into their beliefs, strengths, goals, and personal values (Darby, 2012). Elements such as interest, engagement, enjoyment, and self-efficacy are all key in raising student levels of motivation (Young et al., 2012). As game mechanics are highly motivational, they become valuable tools in the educational process (Gee, 2003).

Relevant Literature

Though Gamification is a "new" field in education, it is actually based in a number of existing educational constructs. Aside from Game Elements, a Gamified classroom is of value as it allows for the inclusion of project-based learning, collaboration, and mastery grading. While these concepts are not entirely unique to Gamification, the Gamified class provides a system in which all of these more progressive educational tools can be utilized.

Project Based Learning

While "projects" in the abstract have long been a part of education, not all of these are actually using project-based learning. Project-based learning focuses on the creation of artifacts that are public representations' of a learner's solution to a guiding question (Grant, 2011). With a basis in constructivism philosophy, the production of a learning artifact is what distinguishes project-based learning from other methods of assessment in that students create their own learning through production, rather than respond to behaviorist stimuli (Grant, 2011). Assignments in a project-based learning classroom are more than poster boards and PowerPoint slideshows; they represent a method of instruction rather than assessment and enforce practical application of that knowledge in a functional product. Students create for the sake of creating, not merely to

earn a grade or solve a challenge. The Buck Institute for example, advocates PjBL as an emphasis for consistent formative assessment (Boss, 2012). Project-based learning is a key component to Gamification as it represents a shift towards formative assessment, practical application, and ownership of the learning. In a Gamified classroom, each unit concludes with a collaborative group project or "challenge" which students must solve using the tools learned throughout the QUEST (described later in Chapter III). More than just a project, these assignments require students to design their methods for solving the problem and produce a final product of presentation.

Collaborative learning

Another key tenant to Gamification is collaborative learning. While Gamification can involve a healthy level of competition between students, the "game" does not require both a "winner" and "loser". The Gamified classroom is designed to be primarily collaborative so that students may work together on most projects much as people are able to do in life. Chang (2010) writes "because games are challenging, instructors can engage their students in either competitive or cooperative ways. Meanwhile, by participating in game-based role-playing, students can simulate social activity and can exercise their imaginations" (p. 322). Collaborative learning allows for students to solve problems in new ways and focus on social skills. It is an emphasis in dialogism, which is not merely speaking, but an ontological view of education and a way of life (Chee, 2012, p. 188). Collaborative learning is a key component to Gamification.

Mastery Learning

Mastery learning is not only a platitude for learning something fully; it is a method of teaching designed by Benjamin Bloom. Bloom (1984) viewed education as a

series of formative assessments in which students were frequently checked on their knowledge and adjustments were made based on the information. If students demonstrated poor understanding of a concept or a chapter, correctives were introduced in order to correct the specific needs of the learner (DeWeese, 2011). The teacher is tasked with differentiation, and being able to adjust teaching as the assessment data is rendered. Mastery learning mandates a student understand a concept before moving on, rather than testing the student and advancing him regardless. One current shortcoming of mastery learning is that this method as yet to reach the same level of effectiveness as a private tutor (DeWeese, 2011; Bloom 1984). In a Gamified classroom, mastery grading is the primary method of assessment as students have the freedom to fail and fix mistakes, rather than be penalized with a poor grade and advanced regardless. Just like a video game, a player may attempt the same challenge multiple times without penalty, provided they ultimately improve their errors and advance. Gamification uses the principals of this goal in order to complete instruction (Weaver, 2011).

Gamification Application

In addition to these background areas, the value of game mechanics is also an important element to understanding the effectiveness of Gamified learning. For the purposes of this study, a Gamified course is one with a narrative in which students are "characters" who must "win the game" by the end of the unit or the year. Bittick (2011) writes that the use of a narrative structure in video games has the "potential to increase outcomes" (p. 27) regardless of gender or experience with the gameplay world. In fact, it has been shown the use of a narrative leads to more engaged and motivated learners than

without (Bittick, 2011). While the style of the narrative is not necessarily relevant, it is important that it exists.

There are few examples of Gamified learning in practice today, though there are multiple cases of technology-infused project-based assessments. In one case (Spires, 2012), a high school literature course is granted the chance to create a video project, which combines multiple senses in order to demonstrate their understanding of a concept. Video projects are currently a combination of the advantages of technology and the authenticity of valid project. In fact, "students, when engaged in video production, have unique opportunities to learn about content as well as to create new visual interpretations of the content" (Spires, 2012 p. 484). Another similar project (Spires, 2012), Cinéma Veritéen follows a five-phase process in order to create the final project: "Ask a compelling question, Gather and analyze information, Creatively synthesize information, Critically evaluate and revise, and Publish, share, and act" (p. 485). This mirrors closely the Synthesis projects assigned in this study's Gamified course. What makes the assignments in this study an example of Gamified learning and not merely project-based learning can be found in the grading system. Gamified learning offers project-based assignments, but under mastery grading and using game elements as a way of tracking assessment. Learning is, therefore, narrative as students see themselves as characters acquiring point and asynchronous as groups only move forward as they achieve mastery. The overall function of the Gamified structure is to create self-paced learning, opportunities for real-time feedback, student engagement, and more meaningful homework (Goodwin, 2013).

An additional key element of the Gamified structure is the use of technology. While Gamification can occur with paper and pencils, technology can offer greater resources to solve problems. Johnson (2004) writes "technologies have the chance to be highly persuasive as computers are used as tools, media, and social actors" (p. 252). In fact, while Gamification focuses on curriculum design and uses of software to enhance or replace the teaching model. Divjak (2011) states that a number of studies are being done with mathematical computer games, which "contributes to boosting their motivation, quicker acquisition and long-term knowledge when compared to teaching without mathematical computer games (17 researches looked into this issues, 14 of which confirmed a positive effect)" (p. 16). The culmination of each of these methods and technologies together offer more value than the sum of their parts (Laird & van Lent, 2000; Van Eck, 2006). Gamification and gameplay seem to have inherent value in enhancing the student learning (Haskell, 2012).

Description of a Gamified Classroom

This study followed fourteen students in a high school senior English class, which had adopted a full Gamified model. All content was delivered online at the students' own pace with a student needing to "earn" the right to move from task to task and level to level. Each unit consisted of direct instruction from the instructor, "Before Reading", in the form of prerecorded video lectures, online videos, and reading from the textbook. Following, students read the assigned text and complete the "During Reading" assignments, which range from discussion boards, journal reflections, worksheets, and other projects. The "After Reading" portion of each unit was a small group project-based assessment followed by an individual assignment.

All assignments in the Gamified curriculum were graded on a mastery grading scale. Each assignment was worth a set number of experience points. If a student earned an 85% or higher on any given assignment, he or she received full experience points and earn the right to advance to the next assignment. Failure to meet 85% resulted in the student making revisions to the project to improve his or her score. Students had the ability to work at their own pace and advancing only when they have mastered the previous content. Each student strived to achieve at least 2000 experience points (XP) per quarter in order to win the game.

Additional "game elements" included the use of a Leaderboard for students with the highest levels of experience points, "Badges" which were automatically earned after completing particular groups of quests, "Awards" which were given due to exceptional work by the instructor, and "Levels" which students earn as they accrue experience points.

Further details of the Gamified classroom including software, expectations, and rules is explained in Chapter III. The Gamified classroom was designed by the instructor/researcher in combination with the required curricular content of the school district and the motivational game elements. The primary differences between the Gamified course and the traditional course were the use of software to deliver content and manage scores, the mastery grading system, and non-linear paths to completing each unit. The Gamified course was student-paced as opposed to the teacher-paced traditional model.

Methodology

This qualitative case study collected data on fourteen high school students in a

suburban school district engaged in a Gamified course. The researcher teaches College Preparation English 12, a required class for high school seniors. The Gamified curriculum was the principal method of content delivery, instruction, and student interaction throughout the school year. Data collection began in the fourth nine-weeks grading period of the school year. Of a classroom of thirty students, fourteen students who demonstrated diverse levels of motivation were selected for data collection. An even number of male and female students were selected, as well as students who demonstrated high, medium, and low levels of motivation throughout the year. Students were selected based on observations from the instructor as well as number of quests, or assignments completed. As not all quests/assignments were mandatory, and not all students completed each task, this served as a way to measure the students' academic progress. Students participated in this study voluntarily and the results no way referenced nor were tied to their grade or final assessment in the course.

Data Collection

There were three data sources in this research study. The first was the existing data on the number of completed quests from participating students. In the Gamified course, students have multiple options to complete the course of study. Students may have chosen to complete a minimum number of quests to pass or receive a specific letter grade while others attempted to complete all available assignments to earn the maximum number of experience points possible. The number of completed quests served as one indication of student motivation and self-regulatory habits. Students with high numbers of completed quests may have been an indication of responsibility and self-regulatory behaviors and motivation, while students with lower numbers of completed quests may

have indicated a lack of these behaviors.

The second data collection method was observations of students in the Gamified-learning classroom. As the principal investigator was also the instructor, it was impossible to complete live, detailed observations therefore the students were recorded semi-weekly for a nine-week period. Class periods were forty-five minutes in length therefore ninety minutes of observation data were collected each week over the nine-week period.

The third data collection method was the use of interviews of each of the fourteen students. These students were selected in order to collect data from a diverse sampling of gender and academic ability. Students were asked about their perceptions of their own motivation and Self-Efficacy in the Gamified course. Interviews were audio-recorded and lasted approximately thirty minutes each.

Analysis

Interviews were transcribed, coded, and analyzed for patterns to gain an understanding of the overall effect a Gamified curriculum can have on the student experience. Likewise, field notes were taken on video observations. These field notes described general student behavior including time on-task, choices in working individually or collaboratively, instructor interaction with students, and transcribed content-specific conversations. Interview responses and observed behavior were compared against each other as well as total number of quests completed. This information was ultimately be coded into major themes to provide an overview of a Gamified learning curriculum's affect on a diverse group of student motivation levels and self-regulatory behavior.

Limitations and Delimitations

This study is a qualitative case study within the researcher's classes. One limitation was the fact that the researcher conducted the study on his own students, which may have produced a chance of bias. In an effort to decrease the probability of bias, a number of efforts were taken. Students were assured that participation, or lack of participation, had no bearing on their grades in the course. Student interviews were triangulated against observation data within the classroom, and quest-completion data from the learning management system. Responses were measured in check with each other. Another limitation is the limited amount of time in which observation data is collected (9 weeks).

The primary delimitation of the study is the choice to use only one instructor (the researcher) in a single subject area (English). In order to describe the effectiveness of Gamification on student learning habits, the instructor needed to be experienced in running a Gamified classroom and be internally motivated to carry out the study. This was the only appropriate, logistically available environment to conduct such a study.

Conclusion

While the current education system has much strength, its original design was customized towards academic and scholarly pursuits. As a result, its potency in reaching all students has been diluted over time. One possible remedy to this imbalance is the implementation of a Gamified curriculum to increase student motivational learning habits including Self-Determination, Self-Efficacy, and Self-Regulating learning habits. Gamification, an incorporation of project-based learning, mastery grading, collaborative work, and video game mechanics allows students more control and responsibility over

their learning environment. Other factors, such as the inclusion of narrative structure and instructional technology make game-based learning highly engaging and motivational for the modern learner.

While Gamified learning has been growing over the past few years, there is little research to investigate its effect on motivation and learning habits. This study sought to find what effect Gamified learning has on student perceptions of their own motivation and what effect the design has on student self-regulatory data. Observation of student behavior, coupled with interviews of an academically, and behaviorally diverse group of students will provide insights into Gamification's varying effects on different personalities. The study marks an important step towards understanding this evolutionary curriculum design in order to guide more students towards meaningful learning.

Chapter II: Review of the Literature

Introduction

Like many human industries, education is a rather complex endeavor. Any industry so reliant on human contact, interaction, and understanding is ripe for massive successes and failures. The current education system attempts to solve this "human equation" using a number of tired and true methods, which may no longer seem to make sense culturally. For example, the current education was founded in a context of scarcity in which it is difficult to gain access to materials, resulting in the creation of the school building where students travel to find their books, teachers, and explanations and gain a small piece of this scarce knowledge (Foreman, 2004). This method has been functional for decades and while it has allowed for great successes, it is filled with shortcomings, primarily as a result of its reliance on existing materials. "Existing educational systems produce individuals who fail to develop a valid, robust knowledge base, who have difficulty reasoning with and applying knowledge, and who lack the ability to reflect on their performance and continue the process of learning" (Koschmann, 1994, p. 229). Jollands (2009) writes that to succeed, graduates need not only technical skills but interpersonal skills as well (p. 143). Foreman (2004) compares the current system to "one tape recorder talking to another" and argues that students learn more from their popular culture, as it is immediately and obviously relevant to their lives.

To help resolve this concern, there has been a call for the role of the teacher to change from "sage on the stage" to "guide on the side" (Weimer, 2002). The problem, however, is that most teachers still relish being in charge and value the co-dependency that exists with their students (Weimer, 2002). This problem is compounded by the increased reliance on standards-based education in American, which, by definition lacks

innovation (Salmani, 2009).

The consequences of continued reliance on the scarcity model, standards-based education, and the "sage on stage" mentality are unclear however it can be argued that reform is necessary. From a theoretical perspective, it is advantageous to change the current system simply to increase educational relevance as "words work best on time and on demand" (Foreman, 2004, p. 58). From a more practical perspective, the rise of commodity jobs (i.e. a job is a commodity job if it can be easily outsourced, and it is easily outsourced if it requires only standard and standardized skills) mandates the need for an innovative work force in increased competition with global participants (Salmani, 2009).

There are undoubtedly hundreds of proposed solutions to this issue; however few have taken hold in the mainstream. Some current research fields include "web-based collaborative learning studies, synchronous communication tools, cooperative learning, mobile learning studies, and class environment" (Keser, 2012, p. 116). Dickey (2006) writes "the movement toward learning environments offers an alternative to the factory model of education in which each student does the same thing at the same time" (p. 247). It is under these current circumstances that the pursuit of viable engaging alternatives begins. One such possibility is the use of game mechanics, or "Gamified learning" as a model. This chapter develops a case for Gamified elements in education, exploring the motivational theories and educational models to identify essential elements to motivate students. Gamified learning is then validated with research from its key components (project-based learning, mastery grading, and collaboration) as a method to increase student Self-Efficacy, Self-Determination, and Self-Regulation. The effect Gamified

learning ultimately has on these three core elements, as well as student perception, were the essential questions of this research.

To begin, one must first consider that the link between games and education is not new to this study. The use of games for learning, and the merging of educational systems and compelling digital games has been well established over the past several years. Below are some of the positive and negative results of this movement.

Games in Education

The inclusion of games in human history and education has been a long and varied one, too vast to be fully enumerated here. Low-tech gaming in board-game format has been used to teach students using multiple-intelligences for years (Manusos, 2013). Consider flash cards as a short-term game, which challenges one or more to remember the answer. The reason for games' appeal and success has been partly seen as games stimulate cognitive properties such as reading implicit/explicit information, reasoning, problem solving and other tools (Bellotti, 2009). In short, games allow one to say, "what if I did this?" (Foreman, 2004, p. 53). Games have currently become so appealing that they are found in "70.7% of American homes and responsible for a 26.6 billion dollar a year industry" (Manusos, 2013). Even so, not all games are created alike. Education-themed video games, dubbed "edutainment", have been of keen interest though they have often fallen short. Vac Eck (2011) states:

> With the success of titles like *Oregon Trail*, many thought edutainment would be both lucrative and revolutionary. But poorly designed titles and overproduction killed this idea almost before it began. One reason for this was that designers

> found it difficult to meld educational content and gameplay without sacrificing one or the other (p. 180).

Embedded learning in video games must be smooth and seamless in order to avoid seeming "boring" and losing games natural motivational attributes (a fact which many designers seems to fail to understand) (Bellotti, 2009). Some hallmarks of quality educational games are the creation of a game community, the ability to gather information from other sources, communication, exploration, and decision-making skills (Foreman, 2004). Furthermore, the most effective games have "regular short/long term feedback, competition, players that can fix mistakes, narrative, conflict, and characters, levels of difficulty, clear structure and rules" (Weaver, 2011, p. 21). The role of games continues to be seen as promising one despite mediocre examples in past years. Games offer an appealing experience and have tremendous opportunity to growth. This study seeks understand what effect the use of game-elements have on student motivation and Self-Efficacy when applied in course design. Of course, human motivation is broad category and requires some explanation.

Motivational Game Elements

Video games are highly motivational, yet the reasons can vary from person to person and task to task. Some foundational elements of motivation can be found in games including Flow State Theory, Narrative, and Neurological Research.

Flow State Theory

One key "game element" which may be a solid curriculum model is motivational power. The question, then, is why do games have such powerful motivational techniques? One such answer lies in "Flow State Theory", the idea that playing a game

(or completing a number of activities) creates a sense of "flow" which captures the user (Csikszentmihalyi, 1980). Some of the basic requirements of flow state theory include:

> 1. A challenge activity that requires skills; 2. The merging of action and awareness; 3. Clear goals; 4. Direct feedback; 5. Concentration on the task at hand; 6. The sense of control; 7. The loss of self-consciousness; 8. The transformation of time ; 9. The activity is autotelic (intrinsically rewarding). (Csikszentmihalyi, 1980; Bowman, 1982; Klasen, 2012)

As a result, the game will make the player lose track of time and self-consciousness (Csikszentmihalyi, 1980, Dickey, 2006, Bowman, 1982). Flow State Theory has long been associated with video games since the 1980's when Bowman (1982) used flow state interaction to help explain motivation of extrinsic supports found in the game, *Pac-Man*. (Dickey, 2006). Klasen (2012), in a study measuring brain function under the nine flow-theory categories, concludes, "sensory-motor network activity appears to contribute to flow even in virtual reality" (p. 494). The ability to capture the user into an experience that makes them immersed and lose track of time would likely be of value to the learning experience. Flow State Theory offers a theoretical starting point for investigation into game-based learning.

Neurological Literature

Another theoretical background behind the role of games in the learning cycle is the neurological component. Games take advantage of "well-established principles of motivation and learning that have been established by experimental psychology and neuroscience research" (Bavelier, 2011, p. 767). While this is not a medical study and cannot cover the full depths of the human brain, there is clearly a connection between

brain functions when presented with game mechanics (Haskell, 2012). There is growing evidence that intensive use of video games results in significant generalized improvements in cognitive function (Han, 2010). In essence, games are training sessions, which deliver highly motivating behavioral situations. The documented gains in processing speed, attention control, memory, and cognitive and social control that result from playing specific games are expected (Bavelier, 2011, p. 763). In fact, to the extreme, "There is now evidence that brain areas that respond to game stimuli in patients with on-line game addiction are similar to those that respond to drug cue-induced craving in patients with substance dependence (Bavelier, 2011, p. 765).

Continuing, there are different elements of the brain that use neurotransmitters in order to communicate emotions such as fear, pain, pleasure, and socialization (Biederman & Vessel, 2006). There is evidence to suggest that different regions, or centers of the brain are responsible for different cognitive tasks, such as performing physical functions, or feeling center emotions (Biederman &Vessel, 2006; Baxter & Murray, 2002). "These centers locate the processes related to pleasure (nucleus accumbens), socialization (hypothalamus), fear and excitement (amygdala), association and socialization (hippocampus), and decision making (frontal lobe) into regions that interact with one another chemically" (Haskell, 2012, p. 28). In short, motivation is chemically aligned with the reward and decision components of the brain.

Beyond the chemical component, gaming appeals to various learning and thinking styles as detailed by Nacke (2011). His research refers to as "Brain Hex Archetypes" for different styles of game play, along with research by Haskell (2012) who matched the

neurobiology with play-style characteristics. There is clearly diversity in game-play and appeals to different styles of stimulation as seen in the chart below:

Table 1:
Play Styles and Neurobiology

BrainHex Archtype	Play-Style Characteristics	Neurobiology Implications
Seeker	Associated with exploration, this play style finds pleasure and enjoyment in viewing, navigating, and discovering elements of the virtual environment often through strong sensory experience	Endormorphin is produced when the brain encounters rich patterns of often sensory information.
Survivor	Players who enjoy high tension related to fear or anticipation of terrifying situations preferred this play style.	Relief of terror releases epinephrine associated with excitement, which enhances the effects of reward, triggered dopamine.
Daredevil	Risky or harrowing gameplay behaviors that involve elements like speed; heights, etc. are emblematic of this place style.	Epinephrine released through risk- taking and the subsequent relief enhanced the effects of dopamine release.
Mastermind	Task oriented. Puzzle solving, strategizing, and successful decision-making are characteristics of this archetype.	The pleasure center and the decision center are closely related. Good decisions are rewarded.
Conqueror	Challenge oriented. Defeating difficult adversaries, struggling to win, And conquering other players offers of this archetype enjoyment.	Difficult situations cause the production of epinephrine (adrenalin) associated with arousal and excitement and norepinephrine associated with anger. Testosterone Is suggested to play a role as well.
Socializer	Socially oriented. Talking to, helping, and building trusting relationships with other players serves as the primary source of enjoyment. The game construct is	Comfort, social connection, and trust as associated with the release of oxytocin.

	secondary to the socialization.	
Achiever	Goal oriented. Motivated by short and long-term achievements and success across the whole of an environment.	Dopamine is triggered through the satisfaction of achieving goals.

Nacke (2011)

Much of this work mirrors the work of Gardner (1987)'s multiple intelligences which states that different people learn and are stimulated in multiple ways including tactical, spatial, visual, or natural. Likewise in games, there are multiple genres and models, which may be appealing to different archetypes. While the biological aspect would fill a study all its own, it is clear there is a basis for game use.

Narrative Design

A third and perhaps more relatable motivational philosophy for the use of games in education is the use of narrative. While not referencing any specific theory, the role of narrative "is ubiquitous in human reasoning and allows humans to assign meaning to their experiences" (Dickey, 2006, p. 252). The act of teaching itself is the ability to assign meaning to content, which students can internalize. For example, in higher education, the goal is to immerse oneself in a culture in order to understand the norms and memes of a certain lifestyle (i.e. business culture, education culture, medical culture). "People who are completely familiar with these small-c cultures are called professionals in a modern sense of the word. In its traditional sense, the term professional meant an individual who worked in such traditional occupations as medicine or engineering" (Salmani, 2009, p. 898). The search for narrative and the use of narrative is then an important part in the lives of the professional world.

Narrative in games can vary on the genre, but a typical game follows the stages of the hero's journey. Vogler (1998)'s contemporary quest or hero's journey comprised the following 12 stages:

> 1. Ordinary World; 2. Call to Adventure; 3. Refusal of the Call; 4. Meeting with the Mentor; 5. Crossing the First Threshold; 6. Tests, Allies, Enemies; 7. Approach to the Inmost Cave; 8. Ordeal; 9. Reward (Seizing the Sword); 10. The Road Back; 11. Resurrection; 12. Return with the Elixir. In addition, there are the following seven character archetypes typically appear within the hero's journey: (a) hero, (b) mentor, (c) threshold guardian, (d) herald, (e) shapeshifter, (f) shadow, and (g) trickster.

This pattern can adequately summarize many stories from children's works to blockbuster movies, to a typical workday. The universal narrative structure inherent in life, media, film, and games allows the learner to assign meaning. Use of narrative, therefore, is a universal human experience, which can be accessed through game design. That being said, for narrative to be effective, it must be genuine. One of the flaws of the early "edutainment" industry was an overreliance on extrinsic fantasy which is external to game play with no impact on gameplay. Even so, intrinsic fantasy is "internal to the game-play experience; there is a reciprocal relationship between game play and fantasy" (Malone, 1981, pg. 333). Another study states that "exogenous fantasy is the type of sugarcoating, or frivolous and extraneous feature, often found in educational games in which fantasy (narrative) has no impact on game play" (Rieber, 1996, p. 49). Malone (1981) argues the value of intrinsic fantasy provide support of how narrative (fantasy) can serve as a cognitive framework for problem solving.

To solve the danger of exogenous fantasy, gaming in education is recommended to be epistemic. An epistemic game is one that lets players learn to work and think as innovative professionals would do. They help students to develop in themselves the c-cultures and epistemic frames of innovative professionals (Salmani, 2009, p. 899). When there exists emotional proximity, or empathy towards the character in the game, the narrative can truly serve its purpose. (Dickey, 2006). In short, narrative theory can be condensed into the idea that humans, in general, seek to assign meaning to their lives. By constructing scenarios in which they can relate, or function within a narrative, there will be more likely solve the problems at hand. "On a cultural level, narratives serve to transmit values and cultural beliefs. The stories enacted in popular games may be a source of reassurance of cultural codes and values" (Dickey, 2006, p. 254).

While games vary in nature, the more successful, engaging, and oft imitated games are ripe with narrative setting. "A game setting can be defined by physical, temporal, environmental, emotional, and ethical dimensions" (Dickey, 2006, p. 259). Narrative has continually shown to be a vital drawn in the gaming world. Bittick (2011) indicates that the use of narrative in educational video games has the potential to increase student engagement and learning outcomes, especially when men are provided with a masculine character and narrative. Overall, the presence of a narrative results in increased flow regardless of gender; however, learning gains only occurred for students given the masculine narrative" (Bittick, 2011, p. 27). From these varieties of settings, results provide evidence to support the hypothesis that students receiving a narrative version of a learning game would be more engaged in the game than those receiving no narrative (Bittick, 2011, p. 24). Narrative is a motivational and engaging element, which increases

learner effort and motivation. “In major parts, these aspects and characteristics are complementary; for instance both storytelling and gaming concepts are used to increase the motivation of users in digital educational games” (Gobel, 2009, p. 43). The use of narratives in games has been used since the early days of *Dungeons and Dragons* and other dice-based role-playing game though it has gained resurgence with the technology. “Game designers are well versed in devices and techniques for constructing compelling and engaging narratives that allow for immersion and agency, demand the participation of users, and yet also provide scaffolding for problem solving” (Dickey, 2006, p. 245). The increased need for narrative in video games is clear. Gobel (2009) continues by stating “a major aspect during the conceptualization of [games] has been set on the integration of measurable, quantitative and qualitative elements and annotations of narrative, gaming and learning contexts” (p. 43). Zhi-Hong (2012) noted a three-tiered effect in Gamified learning in which the game world and the top tier learning activities are coupled using a Quest delivery system. In other words, students “choose” quests from non-playable characters rather than from a list. The results were that the inclusion of Quest coupling led to a higher level of engagement and enjoyment Narrative in games offers a unique sense of learner control.

One complex element of narrative in any video or non-digital game is the paradox of control over the story. In a typical narrative, the crux of the story lies with the storyteller but in games, the control is vested in the gamer. “The so-called ‘narrative paradox’ indicates a conflict between storytelling (narratology; linear, non-interactive, plot-based approach) and gaming (ludology; interaction, non-linear gaming approach)” (Gobel, 2009, p. 43). This paradox is a mirror of the dynamic between teacher and

student the learning space. Just as the instructor must set the tone and environment and even design the lessons, there is an element of control always left to the student. As Rooney (2012) writes "the game narrative was structured around missions underpinned by learning objectives: a strategy which aimed to engage and educate through clear goals and timely feedback" (p. 438). Much like designing game levels or learning lessons, the creation of a game narrative is dependent on modularization. "For creating adaptive game narratives, researchers propose breaking the storyline down into story objects annotated with weights related to their dramaturgic function in the story, the skills practiced, and the game mode they support, which can subsequently be reconfigured" (Zarraonandia, 2012, p. 559). The connection between the learning process and narrative design is a similar one, and the use of narrative only aims to add to the motivational factor of video games. In this study, students work in a course designed like a role-playing game in order to achieve points, level-up, and achieve the rank of Game God. The embedded narrative elements aim to further student interest and this study seeks to gauge that effect.

Learning Models

The value in Gamified learning lies in also draws from existing strengths and weaknesses in the behaviorist, constructivist, and enactivist frameworks. An understanding of this background is crucial to validating this shift in curricular delivery.

Behaviorist

One of the oldest, and perhaps most established teaching models is the behaviorist model. Relying on research of Pavlov (1941) and Skinner (1937), behaviorism states that all human behavior can be modified if the proper stimuli are applied (Ormrod, 2008). The ability for a student to learn is solely dependent on the stimuli that the teacher

exhibits from his conduct in class. Skinner (1937) wrote of the "operational conditioning" model which can be clearly seen in game design. The nature of any game is to use motivational tools to condition responses from the players. Behaviorism is very much foundational in basic game creation.

While successful in certain educational fields such as disciplines of memorization, behaviorism has been met with much rejection in recent decades, including one researcher who states this "carrot/stick method is not sufficient beyond 'rote' learning" (Charsky, 2010, p. 179). Others have described the use of "points" and "grades" as a motivational tools as nothing more than token economy systems where nothing is done without a point value associated with it (Weimer, 2002). Under the behaviorist model, students are often asked to work individually in controlled environments so as to isolate their performance to arrive at an accurate measure of their knowledge. This leads to "quarterly exams and high- stakes testing [that] narrow curricula to formulaic writing devoid of communicative purposes; comprehension of decontextualized reading passages; canonical literature; and decontextualized conventions for grammar, usage, and mechanics" (Brass, 2008). Skills in isolation are not indicative of real world results as working habits such as collaboration are ignored (Ruben, 1999). Even more so, the exclusion of cultural knowledge can have a detrimental effect on student's ability to move knowledge to long-term store (Brass, 2008). Despite the behaviorist model's ability to teach a wide range of content to specific type of student, it possesses a number of shortcomings, which can be damaging to student learning. The alternative, or at least the supplement, lies in more modern schools-of-thought.

Constructivism

Constructivist learning theory states that creating a proper learning environment for students including accessing prior knowledge, scaffolding, and other elements will lead to increased learning and motivations (Chang, 2010). In this model, "teachers do less of the learning tasks, less telling, more design work and more modeling" (Weinmer, 2002). Others argue "the most important key point" in active learning and achievement is "learning motivation" (Chin-Fei, 2012, p. 617). By motivating students with the proper environment, teachers are able to increase learning. What then is the most effective means of motivating a learner? Fu-Hsing (2012) calls the act of play "an intense learning experience in which both children and adults voluntarily invest enormous amounts of time, energy and commitment, while at the same time deriving great enjoyment from the experience" (p. 240). Wiggins and McTighe (2010) established the Understanding by Design model in which teachers should think of themselves as activity planners first and ask, "what do I want the students to be able to do?" It is then they are able to begin effectively designing instruction. Both young and mature students find play to be a fun and focused positive use of energy. One example is Mitra (2001) who performed a study in India with minimal active involvement in which low scoring students taught themselves English using only a computer and trial/error methods. In this case, students were able to construct the knowledge of how to use the computer without any behaviorist intervention and based solely on the environment's freedom for fun. The study demonstrated significant gains in comprehension and problem-solving skills for these previously uninitiated children. Another example of a cognitive method of learning is through the TALP (Technology and Literacy Project). In this study, students used

existing media and technology in order to create a video/project that combines culture with literary themes. This project required the user to involve one's cultural background and connect learning to prior knowledge (Brass, 2008). As teachers follow a constructivist model, they are asked to "construct tasks that draw student in so that they are engaged and energized almost before they realize it." (Weinmer, 2002).

Other learning theories include social constructivism, based on a constructivist paradigm, which argues that learning is not merely acquired from a source but constructed by the learning himself (Hubbard, 2012). As games can involved a good deal of socialization and collaboration between students, this method aligns closely with Gamification. This synthesis of ideas through larger projects and more authentic practices will therefore lead to a more motivated student. Others state that true learning must possess the following traits: Multiplicity, activeness, accommodation and adaptation, authenticity, articulation, and termlessness (Koschmann, 1994). In other words, learning, must be created by the learner, repeated and active, adapt with the surrounding and exist beyond a given term or length. Education has shifted towards constructivism, parallel with complexity of games (Charsky, 2010). Gamified learning finds some of its validity to the role of constructivism and social constructivism as challenges students to create their own knowledge through social situations.

Enactivist

A more recent learning theory from the past several years is Enactivism. This method uses and rejects behaviorism and constructivism as it focuses more on knowing than on knowledge and more on action than on passivity (Li, 2013). Enactivists believe that our mind, body, and world are inseparable. In this scenario, learning takes place

"through the learner's acts and learners interact with objects and events" (Li, 2012 p. 788). As a result of the merging of various components, the environment affects the outcome of a learning activity and the participant becomes far more vital in construction (Li, 2013). While behaviorism focuses primarily on environment, and constructivism focused on internal student-driven motivation, Enactivism depends upon an immersive environment, such as a game world in which learners can demonstrate their knowledge (Gee, 2011). In Enactivism, learning is knowing and knowing is learning. Game playing is social as players the mechanics, practices, negotiation and context of the game players (Li, 2012; Van Eck, 2011). Li (2012) argues:

> Teachers are encouraged to use real clients (e.g. their own students) to design games. Such practice embodies the enactivist condition that not only enables but also, at certain level, facilitates teachers to interact with one another, with their students, and with the objects in their world. (p. 802)

While still modern and lacking in full acceptance into the lexicon, "Enactivism" offers a valid lens for the use of game theory in designing curriculum. Learning in such an enactivist world has impacted teachers positively in various ways, from changed perception to the demonstrated 21-century skills (Li, 2013).

Game Elements

In the effort to create a learning scenario that allows for the benefits of direct behaviorist instruction, and constructivist active learning, while establishing enactivist environments, game elements can be used effectively. Beyond their colloquial use, games have many practical and intentional functions both within and without education.

First, there must be an established definition of a "game". As stated in the definitions, a game is an "activity without meaning" (Callois, 1958). This early game theorist writes:

> The game has no other meaning than intrinsic meaning. [The nihilist's] arguments are irrefutable. That is why its rules are imperative and absolute, beyond discussion. There is no reason for their being as they are, rather than otherwise. Whoever does not approve of them as such much manifest them as folly. (Callois 1958, p. 126)

A game requires then suspension not only of disbelief in the fantasy elements, but a pure belief in the totality of the game rules. By definition, the game requires motivation and buy-in otherwise it ceases to be. In addition, games possess other qualities including that they must be "free, separate, uncertain, unproductive, governed by rules, make-believe (Callois, 1958, p. 128). Malaby (2009) continues with this emphasis on unpredictability, stating, "one of the first things we must recognize is that games are processual. Every game is an ongoing process. As it is played, it always contains the potential or generating new practices and new meanings, possibly refiguring the game itself" (p. 102). As a result, decision-making is the key to a good game. Being forced to make decisions increases learning immensely (Foreman, 2004). Games are simultaneously perfectly defined structures with unpredictable results. By defining games as "contrived forums for the generation of unpredictability avoids the normative judgments contained in the modernist account of games. Instead, and crucially, it places game contexts and other arenas of human experience ontologically on a par with each other" (Malaby, 2009, p. 109). This description, then, allows games to function with concurrent elements of

behaviorism, constructivism, and Enactivism. It is this model that allows for the combination of the three varying styles of education theory.

Beyond the abstract "game", there is also a modern emphasis on the "videogame" which only further expands these qualities. Hamlen (2013) defines video games [as] "spaces which have good learning principles. They provide the ability to absorb new media and literacy. Video games can aid in problem solving as students see multiple solutions (p. p. 110). Even so, despite the nearly thirty-year existence of the video game industry, there remains a conscious lack of dominance in the video game field by education. "Edutainment" as it was originally dubbed has often been met with failure. "Both edutainment and instructional computer games have received a terrible reputation for being the worst type of education, drill and practice activities masked with less than entertaining game play" (Charsky, 2010 p. 177). This phenomenon has frequently been defined as a "Shavian reversal" which maintains the negative qualities and loses the positive qualities of both combined elements. A clear solution remains elusive, but rather than merging existing products; some have begun to investigate the advantages of using game qualities in non-games scenarios. In one study:

> Intense and extended practice time is more efficient for student learning in video games than short periods of practice over an extended time period. This certainly has possible implications for school learning and the ongoing debate over block scheduling of classes, but of course there is no guarantee that efficient learning strategies for video game play apply to different types of learning. (Hamlen, 2013, p. 112).

By analyzing the science behind the video games, it may be possible to utilize the compelling elements of video games in education without falling victim to the Shavian reversal. The first such element which must be respected is that of "play".

Play

The concept of "play" is both an elementary and academic one. A layman, while not in so many terms, may define play as "a vacation from reality, purposeless activity, fundamentally different from a real activity or "an activity on is not obligated to do, a purpose done for its own sake" (Kark, 2011, p. 510). While "play" may be a natural part of the human experience, it is more than a child's activity. "Play is an activity of utmost seriousness which is played out within a "consecrated spot" mentally and physically, with strict rules of its own (Kark, 2011, p. 513). In the world of play, the player experiences an immersive world allows opportunity to participate directly and maximize transfer knowledge and skills (Rooney, 2012). As play is "serious" activity, the use of knowledge, transfer and motivation all gain an added practical importance. As described, play is perhaps the most effective learning technique (Haskell, 2012).

> Play is about stepping out of ordinary reality into a 'higher order,' where one can imagine oneself as someone different, more attractive, courageous, and daring. The power of play is about the symbolic representation of self as the embodiment and actualization of what one has imagined oneself to be and become. (Kark, 2011, p.514)

It is clear that use of games can be both as learning tools and activities in game creation. (Manusos, 2013). Beyond simple enjoyment, play can have a practical application beyond academics. "The ability to play is crucial for today's leadership and management,

since it can enhance leaders' ability to be creative and promote ongoing innovation and organizational change (Kark, 2011, p. 517). Much of the professional world requires that individuals engage in their environments intentionally and with high levels of motivation in order to innovate and improve their situations. Play therefore can be a valuable part of education and professional development. Even so, balance of pedagogical background and "play" elements are essential. Frameworks for essential balance remain elusive (Rooney, 2012). The line between organized play and organized chaos is not always as obvious as it would seem. Regardless, play is one of the more useful and appealing game elements.

Appeal

All other elements aside, games, especially video games, have a vast appeal. Gaming is a strong way to spend time with others and students strongly integrate it into their daily routines (Jones, 2003, p. 2). It was recorded a decade ago that "seventy percent (70%) of college students reported playing video, computer or online games at least once in a while. Some 65% of college students reported being regular or occasional game players" (Jones, 2003). Since then, that number has increased to 97% of teens age 12-17 play computer, Web, portable, or console games (Li, 2013). Cause is likely due to the proliferation of the web and mobile gaming on a variety of devices. Furthermore, games are crucial for the building of an engagement economy. Games have been found to hold a strong appeal as they:

> 1. Challenge players; 2. Activities such as games are fun because they fulfill a desire to compete; 3. Intrinsically motivating for their own sake; 4. Create a state

> of flow in which people lose sense of time; 5. Effort levels are maximized when players have equal skill. (De, 2013)

Each of these characteristics will be explored further throughout the review.

Gaming has appeal across gender lines as well; the stereotypical "gamer" in playing in his parent's basement is more cultural meme than fact. Surprisingly, slightly more women than men reported playing computer and online games (approximately 60% women compared to 40% men) while about the same number of men and women reported playing video games" (Jones, 2003). This is likely due to the fact that women play strategic and puzzle games, while men engage in the typical "action adventure genre" (Jones, 2003, p. 7). What is it that is appealing about games? Beyond the graphics and sounds, there are many aspects of control and power, which augment a game experience:

> These aspects include control, challenge, complexity, achievable and clear goals, hidden secrets, adaptation, debriefing, conflict, fantasy, mystery, and safety […] Evidence has also shown that the use of multimodal interaction and multi-sensory cues may successfully engage learners, enable them to adapt the interaction to their own style, and help them to understand phenomena by providing new perspectives. (Felicia, 2012, p. 7)

In short, games provide a sense of both control and unpredictability of preplanned narrative and interaction. They allow the player to feel a "sense of place", they can experience more realistically (Bellotti, 2009).

Another appealing element in games is the fact they are quick to alleviate is the possibility of failure. While it is common to avoid failure, games allow players to sense

its value. Failure "in a serious game, could be a valuable learning experience because it would improve the authentic and immersive experience by providing realistic consequences. Failure could also allow learners to try new strategies and understand how they learn" (Charsky, 2010, p. 189). Through games, failure becomes expected, natural, and in fact often can make up the bulk of the game experience. When failure becomes commonplace and innovation is encouraged, Gamified learning can become far more routine. Jones (2003) states "a number of students were seen quickly entering a lab, playing some games in an apparent effort to kill time, and then leaving. The manner of some such students suggested a routine, perhaps an after-class relaxation ritual" (p. 7). While graphics play a role in their appeal, the true advantage to games is their all-encompassing experience. It is the ability to generate a sense of interactivity.

Interactivity

One key difference between a game and film, or other forms of media is the inherent interactivity of a game environment. Gaming enables social interaction and users feel more satisfaction in learning a topic if they are actively involved in it and are supported in relationships from other people (Bellotti, 2009). Despite their interactivity, games are different than a direct simulation as they very content specific and are symbolic or experimental executions of other tasks (Charsky, 2010). Simulations may be used in hospital or military training but these are often merely reflections of specific scenarios, which can be solved using rote memorization. Essential game characteristics include competition and goals, rules, challenging activities, choices, and fantasy elements (Charsky, 2010). These elements may be a part of a simulation, though fantasy and choice are often left out of simulation scenarios. A simulation may have only one correct

set of options to complete a task while an RPG style game contains a variety of choices. Choice refers to the number of options and decisions a gamer has prior to and during gameplay, which can be further divided into expressive choice (little effect on learning but can effect motivation) and strategic choices (ways in which the game is played) as well as tactical choices (decision making ability (Charsky, 2010, p. 184). Game interactivity varies from game to game because, in good games, "problems players face are ordered so that the earlier ones are well built to lead players to form hypotheses that work well for later, harder problems. It matters how the problem space is organized — that is why games have "levels" (Gee, 2005, p. 36). It is through interactivity that games derive much of their appeal and difference from other simulative activity. One further unique attribute to games is the use of narrative.

Knowledge of Self and Culture

One of the final and yet oft most overlooked element of gameplay is the connection with culture (social and interpersonal norms) both internal and external. One of the most prolific authors of games in education, James Gee (2005), states that popular games support problem solving by allowing players to become embodied in the gameplay experience. As players work through fantasy worlds, they encounter situations that force them to understand and solve problems. It is not that players enjoy solving problems; it is that the solving of the problems *is* play. By doing, one is able to learn both about the task and oneself. "This is what I will call the circuit of reflective action" (Gee, 2011, p. 255). Continuing, "a player of a video game is an interesting hybrid creature (Gee, 2005, p. 33). The player is part real person in the real world and part virtual character in a virtual world, the character the player "controls" (Gee, 2011, p. 253). So much of human

experience is an avatar. For example, one learns math problems frequently in the abstract as a placeholder for real life examples. One reads and analyzes English texts to prepare for a real-world analysis. The game therefore allows for a quickly assimilation of knowledge by merging for the virtual and the real. Gee (2011) concludes:

> Thus, there is the potential here for players to learn something about their real selves and real lives (to add to their own identity story) and for players to learn something about who they would or could be in a different world, a second life. And this latter discovery can, no doubt, inform their real identity stories in the real world, if their play is deep enough. (p. 355)

As one can see, as a result of their use of play, overall appeal, interactivity, narrative structure, and connection to both personal and cultural backgrounds, games serve as an acceptable model for education design in hopes of increasing motivation and developing authentic, higher-order thinking challenges. This study seeks to understand the use of these "avatar" systems and what effect they might have on student ability to absorb the skills and content from the senior English course. While these elements are key for games in the abstract, Gamification requires some additional components to make it uniquely educational and deliberate.

Gamification Components

Games have a solid connection with the learning process, but the implementation of Gamification is more than just "edutainment" or educational games. This study aims to demonstrate that successful implementation involves the utilization of a variety of different fields including three pillars of Project-Based Learning and Mastery Grading and Collaboration, in order to increase focus on Self-Efficacy, Self-Determination and

Self-Regulated learning.

Project-Based Learning

While projects have long been associated with education, project-based learning has been a more recent phenomenon. Originating for the need for practical application in the medical field, it has been shown to be as effective if not more so than the traditional lecture method in other disciplines (Walker, 2009). It is also true that for years media literacy educators have included in their teaching significant project and activity-based components (Hubbard, 2012, p.164). Part of the reason for this success has been the shift away from third person learning, learning *about* rather than actually knowing are very different things. When one considers the difference between knowing about swimming as opposed to how to swim, the differences are clear (Chee, 2012).

Project-based learning follows a specific set of guidelines including "five criteria […]; projects should be central to the curriculum, focused on problems that drive the students to struggle with major concepts, involve the students in constructivist investigation, student-driven, and realistic" (Tamim, 2013, p.73). Other research has also advocated for the inclusion of " (a) an introduction, emotional anchor, or mission, (b) definition of the learning task, (c) procedure for investigation, (d) suggested resources, (e) scaffolding mechanisms, (f) collaborations, and (g) reflections and transfer activities" (Grant, 2011, p. 39). Project-based learning is an equal focus, then, on both product and process. Various elements include Task: (gaining knowledge and skills, identifying research tasks, obtaining data and information, organization and interpretation of content), as well as outcome: (action, affective, and achievement aspects) (ChanLin, 2008). Students are challenged to both solve a problem and create something new.

Project-based learning, (or PjBL) is different from Problem-Based learning as "projects, as external artifacts, are public representations of a learner's solution to a guiding question. Inherently linked to constructivism, the production of a learning artifact is what consequentially "distinguishes project-based learning from problem-based learning" (Grant, 2011, p. 38). Wiggins (1998) supports this with his Understanding by Design model, which argues that teachers should think of themselves more as activity planners, asking what they ultimately want the students to be able to do and working backwards to determine how and what must be implemented. Students should have big ideas and clear goals (Wiggins, 1998).

PjBL, through its focus in process and product advocates an emphasis in consistent formative assessment (Boss, 2012). Project-based learning requires challenges, tasks, resources, and ultimately a product, which distinguishes itself from simple academic project. "Evidence of the potential of PjBL to heighten learning gains and motivation levels of students is well documented in prior research" (Tamim, 2013, p.73) meaning is acts as a valid tool for implementation of game-based learning.

One of the reasons project-based learning serves, as a valid alternative to traditional behaviorist assessments is that it transcends the current token economy system. Weinmer (2002) writes:

> We know they (rules and points) seem to work in the short term, but are they creating intellectually mature, responsible, motivated learners- ones who when they receive and assignment can analyze it, break it into a set of separate tasks, move to complete those steps in a timely manner, and deliver a quality product?" (p. 97)

As a result, students learn how to work, not just the content itself. Teachers find advantages to this method as well. "Teachers revealed four sets of advantages: support and facilitation of the learning process, differentiation and creative abilities, motivation and engagement, and collaboration" (Tamim, 2013, p.81). Others cited the most valuable aspect of the project-based learning was the production of new knowledge from investigation and exploration and that even when students do not listen when disagreeing, they listen reciprocally (ChanLin, 2008). The creation of new knowledge then allows for the more seamless transition to long-term store for the content while the practical application allows for more effective transitions to the real world. The use of project-based learning leads to more work readiness (Jollands, 2012, p. 143). A properly designed project leads to motivation, which manifests persistence and not frustration (ChanLin, 2008). Effective learning in PjBL depends on students testing their ideas, making mistakes, and learning from those mistakes. Teachers can facilitate this process in PjBL by providing opportunities for formative assessment, as well as iterative cycles of feedback and revision during inquiry and product creation. (English, 2013. p. 131). Even so, enacting a project-based learning environment in the legitimate sense is a difficult task. Hung (2012) writes that:

> A technology-integrated PjBL environment provides a real-world, constructivist, cooperative learning environment that has many advantages over the traditional PjBL environment; that is, the difficulty in conducting the cooperative learning activities has been resolved. However, it remains a challenge to promote students' motivation and concentration on the learning tasks; moreover, it is also important to provide a way to guide the students to organize their knowledge (p. 370).

Proper application then is key in order to take advantage of the positive attributes in PjBL. One key reason is "integrating technology into PJBL requires that there be a strong link with real-world scenarios" (ChanLin, 2008). It has yet to reach saturation.

Technology project-based learning may be in step with typical education philosophy with its focus on prior knowledge, scaffolding, and zone of proximal development (Chanlin, 2008). Even so, it has not reached mainstream as "a critical mass of academic teachers still lacks the competence that enables them to know and to judge why, when and how to use information and communication technology in education" (Schneckenberg, 2009, p. 413). Studies on application have found that one key is "making explicit use of instructional design over technology design is important so that the project is not driven by the tool. (Koschman 1994). When assembling a final product, final projects should be several steps in length, measures understanding and multiple methods of input (Tamim, 2013, p.73). English (2011) argues that:

> "Students work together in groups to conduct research, apply logic and reasoning, and devise solutions to complex problems. The teacher's primary role in PjBL is to structure activities to stimulate motivation and encourage reflection, and to facilitate learning through scaffolding, feedback, guidance, and prompts for thinking. The student's role in PjBL is to take responsibility for their learning and make meaning of the knowledge and concepts they encounter. To do this effectively, it is clear that students in the PjBL environment must be motivated to learn and be able to focus their efforts and attention appropriately, monitor and evaluate their progress, and seek help as needed" (p. 130).

To accomplish this, educators have found success in assigning specific roles to students

involved in a project-based environment. Some methods of use include: "Reinforcing taught content; Extender- takes what was taught and takes it a step further; Initiator- using it as a method of starting, they learn as they go; Navigator- any of previous as long as it adapts learning styles" (Tamim, 2013, p.73). These guided projects, which are both, open and structured, standards-based yet creative are what have led to success.

There have been multiple instances of successful application for project-based learning. Those in the project-based learning demonstrated greater problem solving skills and communication (Jollands, 2012). In Walker (2011), the use of technology-oriented teacher professional development designs for helped teachers use tech resources in PjBL settings. Results have indicated that the use of such methods lead to increases in knowledge, experience, and confidence In the Philadelphia School District, "out of school time" program as been seen as a model for a school wide PjBL system (Schwalm, 2012). While relatively new and growing, project-based learning, beginning with the Piaget (1952)'s and Vygotsky (1978)'s method, and extending to Wiggins and McTighe (1998)'s Understanding by Design is an established method of educational practice designed to increase retention, investment, and practical application of knowledge. In all, it is clear that project-based learning supports higher level cognitive skills, offers opportunities to build more meaningful real world connections beyond small fragmented assignments (Jollands, 2012, p. 143). For these reasons, project-based learning serves as an excellent foundation for which to build a game-based learning structure. This study's design therefore relies heavily on project-based learning throughout the Gamified course. Students conclude each unit with a large group project, which involves solving a large, complex problem or creating an authentic project. The asynchronous, Gamified

infrastructure allows for these types of assessments and, theoretically increases student engagement. This study seeks to understand that effect in student motivation.

Collaboration and Competition

The second major pillar in any Gamified environment is the use of collaboration and competition. Both play vital roles depending on the style of game being created. Collaboration and competition are key factors to increasing valued learning habits such as ownership, Self-Efficacy, and motivation as will be explored later.

Learning, by nature, is a collaborative human process. "It has long been established that social context generally, and peer interaction specifically, impact the learning process and that knowledge construction is a social, collaborative process" (Plass, 2013, p. 1051). The ability to use information actively in social constructs is as valid a skill as the content background. Dialogism is "central to our pedagogical design of the curriculum. It is not constituted merely by words or by talking, but is ontological: it is a way of life (Chee, 2012, p. 188). There are, however, multiple ways to engage with others, including both collaboration and/or competition. This relates strongly with the game model. Because games are challenging, instructors can engage their students in either competitive or cooperative ways. Meanwhile, by participating in game-based role-playing, students can simulate social activity and can exercise their imaginations (Chang, 2010, p. 322).

Both collaboration and competition are of vital importance in the field of education. Five key elements to the future of education include: free and self-directed learning, access to material, learning outcome and achievement assessment, class participation and occasional collaboration, and collective intelligence of the learning

(Songhao, 2011). It is the collective intelligence, arguably undervalued in the behaviorist culture, which is important going forward. Learners in such cases take advantage of collaborative group load: The use of collaboration, which can more easily absorb a large amount of material (Janssen 2010). Collaboration is suited for problem solving because it "encourages students to plan their thinking, verbalize it, engage in joint elaboration on their decision making" (Plass, 2013, p. 1051).

Conversely, collaboration alone cannot bear the full brunt of educational work. If people plan on working together as a part of a group, it is clear that "securing one's own conceptual organization of the learned material is important to minimize disruption and to benefit from collaboration" (Congleton, 2011 p. 548). In other words, a sense of individuality must be preserved. Collaboration is essential to learn from mistakes and improve, but teachers must be able to separate group work from individual work (Tamim, 2013, p.73). As a result, competition is given added importance. Competition in "serious games" or generally in education is beyond beating another player; it is manifest by goals set by the gamer (Charsky, 2010). Both competition and collaboration are vital components in game-based structures and the learning process.

Practical application of collaborative activities in real-world scenarios is manifest in multiple ways in, but not limited to "Learning Management Systems (which include information redistribution, observation and monitoring)**,** Blended learning (the inclusion of technological tools into existing courses with no pedagogical change perpetuating the past), and Education games (ideologically suspect simulations based on model-using rather than model-building approaches)" (Amory, 2010, p. 75). It has also been found that combining web-based learning environments with collaborative learning strategy can

promote elementary school students' learning motivation, which is better than only building the Web-based learning environment. Further, the students could learn the micro-phenomenon of dissolve concept through Web-based environment and change their misconceptions (Chin-Fei, 2012). Learning systems and artifacts built to support collaboration (immersive and pervasive environments, and pedagogical agents), as argued here, offer opportunities to create tools to support transformative activity systems and foster liberationist approaches. Socially constructed tools can overcome the constraints of nature and the environment (Amory, 2010). Other studies have validated that students in collaborative conditions are in better shape than competitive ones (Plass, 2013). Even so, there is an advantage in certain circumstances for competition. Plass (2013) writes:

> Results suggest that in the context of a learning game, competition with only one other player, rather than all other classmates, may be an effective means of invoking a mastery goal orientation without the negative outcomes associated with the invocation of performance goal orientations. (p. 1062)

Collaboration then, along with limited use of competition, offers added support for the learning process. The third pillar in this overall structure would be the outright pursuit of mastery learning.

Mastery Grading

The third major pillar in the creation of a Gamified learning environment is the use of mastery grading or "mastery assessment". A long held but rarely used method of assessment, mastery grading represents a departure for the standardized grading practices of mainstream education.

Mastery learning is a formative assessment strategy that involves the use of specific interventions, called correctives; to address the specific comprehension needs of the learner (DeWeese, 2011). A typical grading system involves teaching, assessing students summative, and then moving on to new content. A far better approach, according to Bloom (1984), is for teachers to use their classroom assessments as learning tools, both to provide students with feedback on their learning progress and to guide the correction of learning errors (Guskey 2007 p. 11). In a mastery grading system, assessment and grades are not a final score but a continually evolving process designed to increase student learning. Benjamin Bloom, the de facto founder of the term, stated the importance of focus on "improvements: home environment, educational technology, peer groups, more 'equal treatment of students with different learning needs'" (Bloom, 1984, p. 2). Initially developed by Benjamin Bloom, mastery learning is a strategy of assessment and differentiation that addresses the needs of individual students so they can receive almost the same quality of instruction as provided by an individual tutor (DeWeese, 2011, p. 4). In his career, Bloom notes that the implementation of correctives following initial assessment led to a one-sigma increase in scores. Mastery Learning leads to one sigma improvement while one-on-one tutoring leads to two-sigma improvement (Bloom, 1984). This was ultimately dubbed the "two-sigma problem" meaning that while mastery learning was effective, it was not as effective as the two-sigma difference in scores produced by the personal tutor. Learning for mastery is effective to one standard deviation of difference but not as effective as a tutor (which achieves "two sigmas"). If there were a way to rectify this, it would solidify the permanent need for mastery learning (Grant, 2007). Over time, mastery grading was

found only to be fully effective with the use of higher mental processes along with mastery learning has led to a solution of the two-sigma problem (Bloom, 1984). In short, mastery grading, in combination with a focus on higher-order tasks and thinking is as effective as the use of a personal tutor.

Others have found validity in Bloom's research including Plass (2013) who states, "taken together, mastery goal orientations provide the most adaptive framework from which to pursue educational goals, and contexts structured to invoke these goals have the potential to benefit student motivation in the long run" (p. 1053). In addition, the practice of mastery learning in a social work education course finds that the use of such a system leads to similar amounts of instructor time but near universal student buy-in for the mastery model and much higher levels of classroom time efficiency and coordination (Aviles, 2001). Mastery is effective not only increasing student knowledge, but also buy-in and learning habits. The use of mastery grading and project-based learning are the two-pillar foundation for a Gamified classroom. With game elements, project-based curriculum, and mastery assessment, and collaboration digital Game-based learning can increase self-efficacy (both in content and technology), Self-Determination, and Self-Regulation, which may lead to improvements of self-regulated learning and higher-order thinking.

Theoretical Framework: Motivation

The foundations of a Gamified curriculum are solid but the intended results are essential as well. This project derived a theoretical framework around Albert Bandura's work, which establishes clear connections between motivation (Self-Determination), Self-Efficacy, and Self-Regulation as well as the importance of these elements in

academic success (Bandura, 1992). For learning to be meaningful and have a lasting impact, students must possess and demonstrate the use of proper motivational learning habits. With these traits, students can begin to achieve greater learning outcomes.

Additionally, Self-Determination, Self-Regulation, and Self-Efficacy are inherently tied to human social functioning, including intrapersonal, communicative, and behavioral traits (Bandura, 2003). Not only does motivation allow for academic success, there is a link between these learning habits and positive social development (Bandura, 1999). As previously explored, games, while competitive, are highly collaborative and promote interpersonal skills, problem solving, social functioning, and group knowledge construction (Chang, 2010, Congleton, 2011, Songhao, 2011; Plass 2013; Tamin, 2013). Bandura (2003) states, "Emotional experiences are heavily embedded in interpersonal transactions. In maneuvering through emotionally arousing situations, people have to take charge of their inner emotional life and regulate their expressive behavior and strategically manage their modes of adaptation" (p. 780). Bandura's work even ranges to include the use of technology in human agency. He states "investments in enabling social aspects of societies are needed to ensure that information technologies and globalization serves as a positive force rather than a devise one in human lives" (Bandura, 2002, p. 16). While not originally linked with Gamified thinking, Bandura draws a clear connection between emotional connections, motivation, Self-Regulation, and social situations with the use of technology as a potentially valuable tool. As a result, this serves as a valid framework from which investigate the positive effects of game-based learning. One of Bandura (1999)'s primary focuses remains the role of student motivation.

The role of motivation in education has long been summarized by the aphorism that there is not such thing as a "bad" student, merely an "unmotivated" student. While this phrase is certainly debatable, motivation is often cited as a factor to learning. Felcia (2012) makes the point that:

> Motivation is one of the key elements to learning as it stimulates students' interests, supports individual and collaborative learning and may in some cases be a predictor of students' success. Because video games support intrinsic motivation, and motivation is believed to have an important lasting effect on learners, [games] have been considered and used for educational purpose. (p. 4)

It is this assumption, which drives one to support the role of gameplay on motivation.

Motivation, though connected with Self-Efficacy and Self-Determination, is the primary reason for completing a task. Motivation is vital because the more motivated the learner, the more time and cognitive effort allocated to monitoring progress, planning improvements, and adjusting learning strategies, suggesting a positive motivation to learn–metacognition relationship (Klein, 2006).

In simplest terms, motivation is the creation of interest and creating a scenario in which the student has something they want to do (Tamim, 2013, Wolters, 1998)**.** Pintrich, (1991) and Klein (2006) indicate that motivation to learn is a robust predictor of course outcomes and is influenced by both individual and situational characteristics. Motivation arises from the development of two forms of interest: Individual and Situational Interest. "*Individual interest* refers to an intrinsic desire and tendency to engage in particular ideas, content, and activities over time […] *Situational interest*, in contrast, refers to the attention and affective reactions elicited by the environment" (Plass, 2013, p. 1054).

Individual interest is interchangeable with Self-Efficacy but the situational interest is often the first and most pressing early motivator, which "leads to the development of individual interest" (Plass, 2013). Game elements offer an initial situational interest through elements of achievement, immersion, and escapism (Haskell, 2012). For example, one of the motivational elements of games is "the individual and personalized nature of the interactions that adapt to the skills and actions of the player" (Jackson, 2013, p. 1037). Other research has isolated various mechanisms common to games, such as feedback, incentives, task difficulty, and control, have a significant impact on motivational constructs which may ultimately affect learning (Jackson, 2013, p. 1037). The collaborative, creative project-based nature of Gamified learning assessment also taps into the second dimension of motivation, focusing on whether the target of such motivation is self-oriented or other-oriented (Forgeard, 2013).

How then are games/Gamification linked with the need for situational interest and motivation? The clearest answer is that games build in rewards systems are highly motivating, playing succeed, motivated by rewards, which causes them to play more and the cycle continues (Hammer, 2013; Hamlen, 2013). DeKay (2013) states "generational cohort to which the [student] belongs may illumine those values responsible for causing the individual to become emotionally engaged. Millennials (born between 1982-1999) are more likely to be motivated by extrinsic rewards, such as salary, than are baby boomers" (p. 250). External motivational factors are therefore more suited to the current population of students as opposed to older generational cohorts. A game's nature is to increase a gamer's enjoyment and occupy a gamer's time. By nature, they possess

inherently motivating qualities. Results assert that motivating factors in MMORPGs (Massive Multi-player Online Role Playing Games) are (in order of appeal)

> 1. Relationship: The motivation of interacting with other users and form meaningful relationships that are supportive; 2. Achievement: Becoming powerful, collecting items, gaining rank or prestige; 3. Immersion: Enjoyment derived from being in a fantasy world or becoming someone else; 4. Escapism: Using the virtual world to escape from real-life stress and problems; 5. Manipulation: Deceiving or objectifying other users for personal gain or satisfaction; 6. Lead: Motivation to lead others; 7. Solo/Group: The desired to play alone or in the context of a team. (Haskell, 2012, p. 26-27)

Each of these methods acts as a different form of situational interest which is quite motivational towards the gamer and learner. This is essential for increasing individual interest and therefore leading the student to a culture of high Self-Efficacy.

Self-Efficacy

Bandura (1992)'s first major motivational element, which frequently arises from games, is that of Self-Efficacy, or one's views on their own abilities. Bandura (1997), arguably the definitive voice on Self-Efficacy, states that the success and failure of one's endeavors is often decided internally prior to action. He argues "people motivate themselves when they form a belief about what they can do and set goals (Bandura, 1997). As a result, one's view on one's self will have a pronounced ability in making future choices. "Low Self-Efficacy people avoid difficult tasks. People with high-perceived self-efficacy approach difficult tasks as challenges. The amount of stress one

feels is a result of their view on how likely they are to cope" (Bandura, 1997). As a result, all forms of learning, by definition, rely upon and affect self-efficacy.

As a general construct, Self-Efficacy is a perception about one's abilities within a given domain as well as a belief in their capability to organize and execute a course of action required to deal with prospective situations (Abbitt , 2011; Laver, 2012). The difference, however, between self-esteem and self-concept in that Self-Efficacy is tied it solely with academic achievement (Zimmerman, 2000). Self-Efficacy remains of vital of importance to educators due to its continued connection with achievement. There is a clear relationship between academic achievement and disposition as "knowledge and beliefs are inextricably intertwined" and that "beliefs are instrumental in defining tasks and selecting the cognitive tools with which to interpret, plan, and make decisions regarding such tasks" (Zimmerman, 2000, p. 325). Self-Efficacy is not equal to outcomes, such as however it "is an affective state that interacts with these measures, at times as a reinforcement" (Mayfield, 2012, p. 360). In addition "Self-Efficacy judgments specifically refer to future functioning and are assessed before students perform the relevant activities. This antecedent property positions Self-Efficacy judgments to play a causal role in academic motivation" (Zimmerman, 2000, p. 84). While "Rehearsal, Elaboration, Organization, Critical Thinking, Metacognition, Self-regulation, Time management, and effort all lead to achievement, it is Self-Efficacy leads to all of these attributes (Sadi, 2013, p. 27). Another calculation of Self-Efficacy's relationship with performance is "Human Performance = f(self-efficacy × ability × motivation) + situational factors such as gender, management development policies, and technological knowledge" (Mayfield, 2012, p. 361). The knowledge of one's own abilities has a strong

connection with one's own motivation to accomplish a task.

The ability to increase Self-Efficacy is also closely connected with previously established methods "social cognitive theory proposes that possible strategies for increasing self efficacy include the use of mastery, modeling and encouragement" (Laver, 2012, p. 225). Abbitt (2011) states that the four primary influences on Self-Efficacy beliefs as "(a) enactive mastery experiences, (b) vicarious experiences, (c) social influences, and (d) physiological and affective states" (p. 134). Among these four influences, mastery experiences were suggested as having the strongest influence on Self-Efficacy beliefs and thus a strong influence on behavior. Self-Efficacy, then, has strong links to both mastery learning, and motivation making it a vital link between the two.

Digital game-based learning allows not only for Self-Efficacy in content knowledge but also a strong focus on technology Self-Efficacy. While content, especially in certain fields, can remain static, it is largely agreed that technology is ever changing and highly persuasive as computers are used as tools, media, and social actors (Johnson 2004). It is vital, therefore, that students not only master the content but also high Self-Efficacy in the technology fields. As technology changes, the theory is that people with higher levels of Self-Efficacy engage more willingly and more quickly than those without (Laver, 2012). Since "Self-Efficacy beliefs are predictive of two measures of students' *effort*: rate of performance and expenditure of energy", the ability to raise technology Self-Efficacy will be beneficial to students in a long-term sense (Zimmerman, 2000 p. 86). Technology usage manifests itself primarily in two different fields, Professional and Personal. An increase in technology Self-Efficacy will have a strong impact on both.

Use of technology in both professional and personal realms is a highly researched field. “Technology acceptance has been described as the, ‘approval, favorable reception and ongoing use of newly introduced devices and systems’” (Laver, 2012, p. 221). In the field of education, for example, “understanding pre-service teachers’ knowledge, attitudes, and beliefs about educational technology provides insight into how they are likely to use technology in a classroom environment in the future” (Abbitt , 2011, p. 134). It is seen as vital that teachers possess proper knowledge and motivation to use the most recent tools to enact change. “Learning technologies have, in pedagogical perspective, have the potential to foster to a paradigm shift from teaching to learning; this topic has a long tradition in educational research” (Schneckenberg, 2009, p. 412). Technology integration shows the connection between knowledge and Self-Efficacy beliefs by stating that “although knowledge of technology is necessary, it is not enough if teachers do not also feel confident using that knowledge to facilitate student learning (Abbitt , 2011 p. 136).

In preparing for a Gamified setting, it is necessary for students to have the proper collaborative tools. Lipponen (2004) outlines the needs for technology specifically designed to assist with collaboration including “its design is grounded in some explicitly argued theory of learning or pedagogical model; it relies on the idea of groupware; it provides procedural facilitation; and it offers representational and community building tools. Collaborative applications lack one or more of these qualities (Lipponen, 2004, p. 439). Technology is also vital for students in the multiple methods of learning. “In addition to Self-Efficacy in the specific online course, the skills of using online learning technologies are also important. These skills include, for example, the use of emails,

discussion boards, and Internet searches. Students who fear computer technologies may experience confusion, anxiety" (Wang, 2013, p.304). The correct understanding of one's own abilities is of vital importance to understanding one's potential and achieving it. Self-Efficacy is but one of many desired result from a Gamified curriculum.

Self-Determination

While Self-Efficacy is the measure of one's own perception of one's ability to complete a task, Self-Determination (also called "grit" or ownership) is one's perception of personal responsibility for the task at hand. As late adolescent students show decline in motivation as opposed to younger students, it is vital to increase student ownership over content (Van Nuland, 2012). One possible manifestation would be a learning contract, which transfers the ownership of the learning to the students themselves. Such goals include:

> 1) identify and record 2) set the objectives and aim of self-learning 3) identify the methods to be adopted in achieving the aims 4) Set the time period for execution and result 5) provide proof that the objectives have been achieved 6) determine the level of the assignment/learning achievement and how it would be evaluated 7) determine each student's learning objective based on their own interest and ability 8) plan the work to be produced. (Atiq, 2012, p. 559)

One practical framework of ownership is Self-Determination theory, which is defined, as healthy motivation must be intrinsic, and competence, autonomy, and relatedness must be met for it to happen (Van Nuland, 2012). Self-Determination theory "operates under the assumption that people have a natural tendency to learn" (Van Nuland, 2012, p. 468).

Self-Determination theory, then maintains a strong connect to game characteristics as gaming naturally appeals to a sense of ownership as "instructional games appeal to students, as they provide a new learning culture that corresponds with students' pre-existing habits and interests" (Li, 2013, p. 311). Ownership is both important to the learning process and a natural extension of Gamification.

In practical application, Self-Determination and ownership have been achieved through an increase in learner control. For example, Casim, (2013) states that the techniques of ownership in online learning include: Finding personal value, feeling in control, and taking responsibility. Allowing learners to set their own learning goals can lead to higher commitment. By incorporating these elements into assessment and learning activities, higher levels of learning can occur. It is also been found that innovation in assessment particularly in allowing students a voice in how they are assessed and increasing the role of formative assessment. In these methods, students asked to self and peer assess in that they might glean more from the process and take ownership of the results (Taras, 2002). In order to increase ownership, it is vital that students are given range of options in both the formative and summative assessments. This is a natural companion to the element of "choice" and "freedom to fail" found in game mechanics.

Self-Regulated Learning

Bandura (2003)'s third key motivational element is self-regulated learning, which is defined as "an active and constructive process that involves the students' active, goal-directed, self-control of behaviors, motivation, and cognition for academic tasks" (Wang, 2013, p. 302). In fact, Self-Regulation acts as "one of the core features in human

agency" (Bandura, 2003). While the ultimate goal of any teacher varies, one of the most versatile and long-lasting objects is instilling with a student the ability to learn at one's own pace with one's own resources. "In order to be successful in [problem-solving] students must take responsibility for the learning process by setting goals, monitoring, reflecting, and sustaining their motivation from the beginning of the project until the end" (English, 2013. p. 127). Self-regulated learners are "able to set goals, plan a course of action, select appropriate strategies, self-monitor, and self-evaluate their learning. They are also intrinsically motivated to learn and report high Self-Efficacy for learning and performance" (English, 2013. p. 129). Self-regulated learners do not simply score well on exams but demonstrate patterns of successful skills, which allow them to learn autonomously. Self-regulated learning strategies involve:

> 1. Rehearsal: recitation, reading aloud, highlighting, or underlining; 2. Elaboration: summarizing, creating analogies, generative note-taking, explaining the ideas, and asking and answering questions; 3. Organization: main idea, outlining, using a variety of techniques for organizing; 4. Critical thinking: process to shape and evaluate decisions. (Sadi, 2013, p. 24)

While the pattern itself may vary by student and by study, there is clearly a method of success in order to be truly self-regulated. To effectively engage in learning, students must:

> Become responsible for their learning and actively participate in the processes of constructing knowledge and making meaning For many students, this role conflicts with deeply ingrained habits they have developed through more familiar

> classroom experiences, in which they have been passive recipients of knowledge. (English, 2013. P. 128)

Research further suggests that learners do not always use their control effectively or apply the needed strategies for Self-Regulation (Klein, 2006). Sadi (2013) has found that students with high Self-Efficacy will cite lack of effort for poor performance while students with low Self-Efficacy will cite low ability. The solution then is a use of self-regulated learning. "Higher levels of motivation lead to higher levels of technology self-efficacy and course satisfaction. Higher levels of technology Self-Efficacy and course-satisfaction lead to higher grades. Courses should promote these things including user friendly online platforms" (Wang, 2013, p. 305). In application then, self-regulated learning is facilitated in project and game-based learning through multiple activities. According to the social cognitive perspective, self-regulatory processes fall into three cyclical phases: 1) forethought, 2) performance or volitional control, and 3) self-reflection (English, 2013). Self-regulated learning is therefore the pinnacle of learning practice as it leads to the highest levels of Bloom's Taxonomy (Evaluation), utilizes the synthesis of motivation, self-efficacy, and ownership, and leads to individual critical thinking. Game and project-based learning offers a clear link to this ultimate goal.

Modern Solutions

While theory is essential to all element of teaching, it is also important to be able to see it in action. Gamification is currently new to the field so there are few examples of existing Gamification ecosystems however there are a number of teachers, schools, and programs which have incorporated some of these techniques into their teaching.

Blended and Flipped Learning

Both a successor to online learning and predecessor to Gamified learning, "blended learning" as taken many forms to address the increase need for mastery learning, collaboration, and self-regulated learning habits. One recent fad has been "flipped" learning which is a combination of understanding by design, project based learning, mastery grading, and technology (Sams, 2013). While it does not use game theory and game-elements, flipped learning has a good deal of overlap with Gamification. Flipped learning can be self-paced learning, along with opportunities for real-time feedback, student engagement, and more meaningful homework (Goodwin, 2012). In addition, many universities have shifted towards "blended learning" or the combination of live instructors with an online component. Hybrid models that combine E-learning with classroom or lab sessions show productive learning that has been though through (Romizowski, 2004). Others have relied on the term "Learning objects [are] interactive Web-based tools that support learning by enhancing, amplifying, and guiding the cognitive processes of learners" (Kay, 2008, p. 447).

Even so, there has not yet been a mainstream adoption of blended learning or "digital learning objects". Poor course design; poor e-classroom design; ill performing technology; lack of reward structure; lack of feedback; poor time management skills have all contributed to a failure to shift the paradigm with blended learning (Romizowski, 2004). Reasons people refuse to use learning objects include: objects being prohibitive in nature, they do not know about their teaching advantages, time needed to find good learning objects was prohibitive (Kay, 2008). While learning objects have overall positive student views including animations, self-assessment, control over learning, ease

of use, feedback, scaffolding, navigation, and self-efficacy. Negative views included navigation, technology, and an increased workload (Kay, 2008). Additionally, specific tools have been used to engage in more technology-driven, student-centered approaches.

Digital Applications

Some modern applications in Gamification have the ability to monitor and measure student progress. Already, learning management systems such as Edmodo, Schoology, and Blackboard allow for teachers to post content and monitor student consumption of the data. A new trend is digital backpacks, which consists of Foundational Technology, Modular Technology and Instructional support and materials (Basham, 2011). Much of the work being done now is to provide students with the ability to work in any capacity. The Gamified structure facilitates this as it removes the linear time structure from education and allows students and groups to work at their own pace. Another instrument currently in development is by "researchers who create an instrument that evaluates games based on their ability to produce a change in mentality, emotional fulfillment, knowledge enhancement, develop thinking skills, interpersonal skills, spatial ability development, and bodily coordination" (DeWeese, 2011, p. 14). In addition, there is a lot of work being done on the necessary game types in order to successfully teach the students. Chang (2010) writes of four principles including Challenges, Competition, Cooperation, and Authentic. Chang (2010) delineates these as:

> Challenges (Principle 1): The contents of the game need to be challenging in order to arouse students' curiosity.
>
> Competition (Principle 2): So that students' motivation remains high, either individual students or groups need to compete with each other.

(3) Cooperation (Principle 3): The design of the game should help students to develop a sense of 'work as a team and win as a team'.

(4) Authentic tasks (Principle 4): The game should incorporate authentic real-world cases, instead of textbook-like materials. (p. 322)

Many of the skills outlined in these educational games are also the goals of project-based learning and Gamification as a whole. With such work being done to monitor and classify games, it is clear that Gamification is an upcoming field. These studies on future instruments provides further validation for game-play's use in the world of education.

One of the best examples of Gamification's ability to motivate and create authentic learning is the use of more practical projects, specifically in the humanities. One current field of studies, which can be incorporated into the world of Gamified learning, is "Video art" or a method of re-creating mass media. This focuses on re-editing raw materials from media cultural into a new format to critique society (Spont, 2010). With technology and society shifting from a text-based culture to a video-based culture, it is important to be able to apply the literature-based skills in other fields. Spont (2010) writes is best when he writes that Video Art is "in broadest conception, this approach proposes using re-appropriated popular culture as a starting point for content and concept, moving from the familiar to the unfamiliar, and as a multi-sensory form with which to play, from which to begin critique (Spont, 2010, p. 311). The ability to play with video as if it were text and combine more meaning, allusion, and symbolism than traditional language is a far more meaningful project to high school students. The Gamified structure allows for projects such as this to occur. This is further explained by another David Bruce (2009) who writes that the "differences between print and video

composition are profound. They include form of representation, task setting, and curricular role. One fundamental difference between video and print is the modality through which the depiction of meaning is conveyed" (p. 428). This author noted the use of this project is not about the technology; it is about the ability to convey meaning, which is precisely the goal of project, based learning. During one session, Bruce (2009) notes that his students took nearly a half-hour to create eight seconds of video. This was not a result of carelessness but rather careful attention. The ability of video, culture, technology to capture students' attention inside this compelling project narrative structure is truly valuable.

Counter-Arguments

While Gamification clearly has benefits in its ability to increase motivation and higher-level authentic learning, it is not without it detractions. The first mention, and also the reason for this study is the extremely limited research the effects of game-based learning on student motivation, disposition and content growth (Hamlen, 2013, Goodwin, 2013). The crux of the argument for gaming has been the games are motivating and lead to authentic learning however some have mentioned that games do not lead to greater motivation but do lead to great learning (Wouters, 2013). There has been some "research on the instructional effectiveness of hands-on discovery methods in in-game environments" which states that such environments do "not offer strong supporting evidence" (Adams, 2012, p. 238). Furthermore, a similar study found that while narrative is more immersive at times, games and narrative could detract and distract. (Adams, 2012 p. 238) One study particularly on the difference between games and narratives found that "students did better without the game, and the same with narrative vs. not narrative"

(Adams, 2012, p. 246). In addition to the distracting nature of games and narrative designs, other researchers have stated that assessments in a project-based or game-based environment, because they are not sufficiently standardized, can be inequitable which can lead to student frustration (Capdeferro, 2012, p. 37).

Continuing with these counterarguments, some research indicates collaboration and group work can have some negative effects. There has been noted to be a phenomenon in which groups as a whole are able to remember far less than individuals. One author notes that the reverse, "collaborative facilitation, where collaborative groups recall more than nominal groups, has rarely been demonstrated" (Congleton, 2012, p. 536). Group work has some disadvantages.

Some final points about the negatives of Gamification is that it relies heavily on discovery learning and partially guided instruction so that students create their own knowledge. Clark (2012) writes that while "research has provided overwhelming evidence that, for everyone but experts, partial guidance during instruction is significantly less effective than full guidance (p.6). In addition, the heavy use of technology is a Gamified structure can potentially lead to the lack of face-to-face instruction. Face-to-face instruction often leads to unscripted learning, which can add to the overall effect of the education (Whithaus, 2006). A final downside to Gamification is simply the time required to create such a system. It is often extremely difficult, time-consuming, and costly (Kapp, 2012, p.66). To conclude, Gamification, while solidly based in valid educational theory, research, and trends, is not without rebuke. All of this being said, Gamification need not wilt in the face of criticism.

Rebuttals

While many of these points are valid in themselves, they do not discount the entire discipline. One of the first statements against Gamification is that while games are motivating, they do not truly accomplish anything. Games, by some definitions, are "non-productive and participation therefore does not accomplish anything useful must be discounted since non-productiveness does not apply in the education context" (Erenli, 2013, p. 20). Gamification is designed to appropriate the game structure and complete something productive with it. The very definition of Gamification has "game-based elements in a non-game format" presupposes that Gamification is meaningful. "The more non-game-related elements receive Gamification treatment, the more they drift towards game-related elements. Therefore, Gamification can be considered a virus" (Erenli, 2013, p. 20). Another note about games is that the disconnect between motivation and learning. While it is true that games and narrative can be distracting, that does not preclude them from educational use. In fact, it is necessary to create a game with a narrative heavy enough to immerse the student but light enough to keep focus on learning lest the student divert full focus towards winning the game and not the content" (Fu-Hsing, 2012, p. 246).

A further point is that Gamified learning leads to a lack of full guidance and face-to-face discussion filled with unscripted moments. While this may be true, it can also be said that there is no clear evidence that unscripted learning leads to anything substantial" (Whithaus, 2006). Just as games and flipped learning do not necessarily have proven support, neither does "unscripted" learning or face-to-face discussion. It may not necessarily be a determinant to lose some of this from the course. The final point about Gamification is that is difficult to accomplish and lack much evidence. Goodwin (2013)

says it best when he writes "the lack of hard scientific evidence doesn't mean teachers should *not* flip their classrooms; indeed, if we only implemented strategies supported by decades of research, we'd never try anything new" (p. 78). Gamification is about taking the technology at hand along with existing educational theories and creating a system that is able to lead to higher levels of learning. While there are studies that state narratives can be distracting or group work can be difficult, it is important to solve the problems and move forward.

Conclusion

Modern education owes its foundation to the behaviorist movement but has recent seen a shift towards constructivism because:

> The history of educational technology can be characterized in terms of four ages: (a) the age of instruction (cognitive-base design and research), (b) the age of message design (design and research of media and delivery), (c) the age of simulations (focus on simulations and interaction), and (d) the most current age, the age of learning environments. (Dickey, 2006, p. 247)

In this new age of environments, it is vital that teaching focus on self-regulated learning and critical thinking as its top priority. To achieve this, a system must promote motivational concepts such as Self-Efficacy, Self-Determination, and Self-Regulation. Each element serves a learner a different facet of the learner's motivational. To achieve these qualities, learners must be engaged in tasks that are not only rigorous and appropriately challenging, but also be designed to facilitate these traits. As a result of their inherent motivational properties such as "flow", narrative, and neurological implications, games act as a suitable model for increasing the likely hood of Self-

Determination, Self-Efficacy, and Self-Regulation. Game elements in education are also similar to existing and established constructs such as project-based learning, mastery grading, and collaborative activities. While Gamification is yet a rising method of choice, it is not fully unique to this study. In fact, a new school has been designed whose entire curriculum is based around games as learning tools, and game design plays a significant role in the curriculum (Van Eck, 2011, p. 180). The conflict though lies in the lack of results. There still remains little perspective in other disciplines, and a lack of solid models for creating games (Van Eck, 2011, p. 184). As a result, this study looks to implement a version of Gamification incorporating all elements above and measure what effect it has on student perceptions of their own Self-Determination, Self-Efficacy, and Self-Regulated learning pattern.

Chapter III: Methods and Methodology

Introduction

As seen in the literature, there is great interest in education to strive towards higher levels of student motivation, self-regulated learning, ownership, and self-efficacy in order to lead to more relevant and longer lasting learning experiences (Abbit, 2011; Bandura, 1997, Bloom, 1984; Congleton, 2011; English, 2013; Klein, 2006; Sadi, 2013). There is clear value in game mechanics as a mechanism for achieving this goal, along with a reliance on project-based learning, mastery grading, and collaboration/ competition. While Gamified learning has gained support theoretical over the past several decades, there remain few viable practical models, and little research validating the real world effect of game-based learning on student working habits. This study sought to answer the following research questions:

1. What effect does a Gamified curriculum have on student motivational learning habits including Self-Determination, Self-Regulation, and Self-Efficacy?
2. What are the students' perceptions of Gamified learning?

As research validates that perception of one's abilities and habits is indicative of results, (Bandura 1997; Pintrich, 1990), this study sought to examine the effects of the curriculum on student's views of the own abilities.

Methodology

The study followed a qualitative case study design. While quantitative a research functions in conjunction with a more scientific method, qualitative research involves the use of observation, interview, descriptive, and verbal data in order to yield results (Cresswell, 2007). Of the five major types of qualitative research (ethnography,

grounded theory, phenomenology, narrative study, or case study) the case study was deemed most appropriate from this project. There is no "grounded theory" being derived, nor does this study seek to understand the underlying culture of the high school system in ethnography. The study is not the result of a unique phenomenon as the principal investigator/instructor created the gamified course design for this course. Finally, this study did not seek to tell a narrative about a student or student's interaction with this design; it seeks to find patterns in student motivational learning habits as a result of the Gamification. Therefore, a case study was selected as the method of choice. A case study focuses on a single instance or example in order to test or investigate a research question (Cresswell, 2007). As this study seeks to identify student perception of Gamified learning, and effect on student motivation, it was inappropriate to collect this data solely numerically as both qualities are non-numeric in nature and vary from student to student. This form of qualitative research, therefore, is not generalizable as the specifics of each case can vary the overall results. Case studies were selected in this study, as it was the most appropriate of the five major qualitative research methods.

Using a purposeful sample from a convenient population, the study consisted of observation data of student behaviors using the Gamified-learning model. To triangulate these observations, interviews asked students individually, about their dispositions towards the Gamification system and on their own learning habits. Additionally, documentation and data on number of completed quests will be used to triangulate links between motivated and unmotivated behavior. This chapter will explain the Gamified learning classroom used, research design, the sample chosen, the instrumentation, and the analysis procedures.

Gaming Method

Prior to the data collection process of this study, students were engaged in a Gamified curriculum for over one semester. The Gamified curriculum was structured using the basic tenants of a video game in combination with project-based learning, mastery grading, and collaboration. Students located and submitted their work in a Learning Management System called 3D Game Lab created by GoGo Labs and Boise State University. What follows describes the course's design, mechanics, and practice.

Course Design

This English course was divided into twelve units called QUESTTs, which is an acronym for Questions, Understanding, Explore, Test, and Take-a-Break. The QUESTT framework, designed by the principal investigator, allowed students to see to monitor and manage their progression through each unit. At the beginning of the course, students received a syllabus, which stated the following:

Questions- The Questions are the overall driving forces of the unit. The goal of each student is to demonstrate they understand and can answer these questions.

Understanding- These individual lessons are often direct instruction activities designed to give students the necessary background for the units.

Explore- These activities, done either in pairs or individually, revolve around reading and analyzing specific texts, characters, terms, and concepts. The Explore activities are structured so that students, collaboratively, can teach themselves the key concepts.

Synthesis- In small groups of 3-4, students will complete an overarching project for the unit in which they create either a project or presentation, often incorporating

technology or other publishing tools. These assignments are often presented as "challenges" in which students must solve a problem and design their own solution/project rather than following a strict rubric. Projects require multiple stages, are very detailed, and require a large amount of work.

Test- Test assignments are designed to assess if the individual has mastered the Questions and key concepts of the unit. Test assignments are often multi-paragraph essays, presentations, or in-class writings.

Take a Break- Before moving on, it is always good to stop and reflect. "Take a Break" assignments are quick, light, and designed to be something fun before starting the next QUESTT. As the academic year is divided into quarters, students are tasked with completing three QUESTTS per quarter in order to achieve the equivalent of an "A".

Basic rules of the course were such: students began the course as "Seekers" who must work their way up to "Game God". They worked their way forward through British Literature history in order to achieve this ultimate rank. In order to move up in rank, students acquired varying amounts of Experience points. The ranking system was:

Table 2
Point/Rank Chart

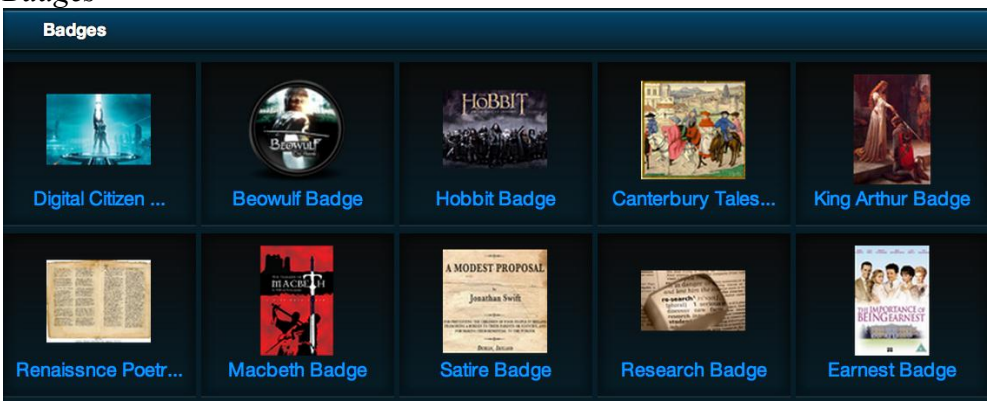
Rank	Points	Rank	Points	Rank	Points	Rank	Points
Seeker	0	Wizard	1600	Thane	3600	Earnest	5600
Applicant	50	Pilgrim	2000	Journalist	4000	Romantic Poet	6000
Digital Citizen	400	Host	2300	Satirist	4300	Literary Critic	6300
Geat	600	Squire	2600	Wanderer	4600	Last Lecturer	6600
Epic Hero	1000	Royal Knight	3000	Scholar	5000	Graduate	7000
Hobbit	1300	Scotsman	3300	Jack	5300	Game God	8000+

Students obtained experience points (XP) by completing quests. Experience points served as a reflection of the time and effort required for an assignment. Smaller "Understanding" or "Explore" quests were only worth 10 or 20 points while Synthesis projects may be worth 150 or 200 XP. Questions existed in two separate structures: task-based and goal-based. These are defined as 1. Task-based quests: a detailed list of procedures that produce a uniform product; 2. Goal-based quests: Activities that provide an outline of the deliverable with freedom to embellish or create (Sullivan et. al, 2009). Goal-based quests were considered more valuable though task-based quests were essential to obtain goal-based skills. The completion of quests enabled students not only to obtain points but also access to the next level.

In addition to the "main quests", each unit contained several optional quests designed to offer supplemental help to struggling students or enrichment to successful students. Students may have opted to complete these lessons in place of or in addition to the "traditional" path. The addition of choice and flexibility was both a game element while increasing student motivation and efficacy (Gee, 2003).

A final method to collect experience points was through rewards, which were manifested in three different types: Badges, Achievements, and Awards. Badges were pre-programed and assigned upon the completion of a certain selection of quests. Figure 1, below, shows several examples of badges that could be earned over the year.

Figure 1:
Badges



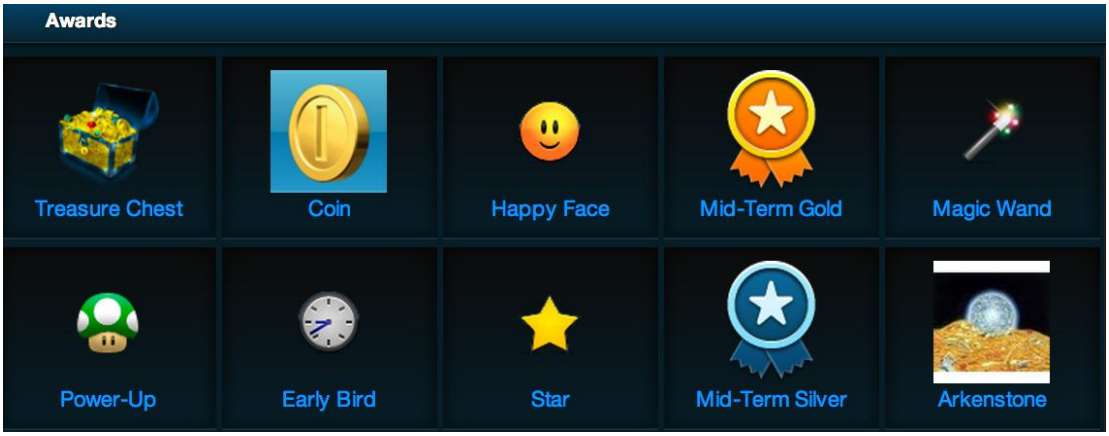
For example, the completion of all "Macbeth quests" may have earned the student a Macbeth Badge. Each badge came along with a predetermined number of experience points to reward the user.

Another type of extrinsic motivator was Achievements. Achievements were also pre-programmed and awarded when students "Level-Up". By advancing from "Hobbit" to "Wizard", students, for example, received the "Wizard" achievement. At times, "achievements" could be synonymous with rank, however there were other achievements as well. For example, if a student completed all requirements to achieve an "A" for the semester, they received a corresponding Achievement to indicate this goal. Achievements, seen below in Figure 2, were indicative of specific milestones in the class.

Figure 2:
Achievements

The final category, Awards, was given at the discretion of the instructor. Awards were given for individual tasks such as asking a good question, helping others, or going above and beyond on an assignment. Figure 3, below, shows examples of the "Awards" that students could achieve over the course of the year. As needed, different awards were created for different assignments. A student could click on each award to see both its requirements and its experience point value.

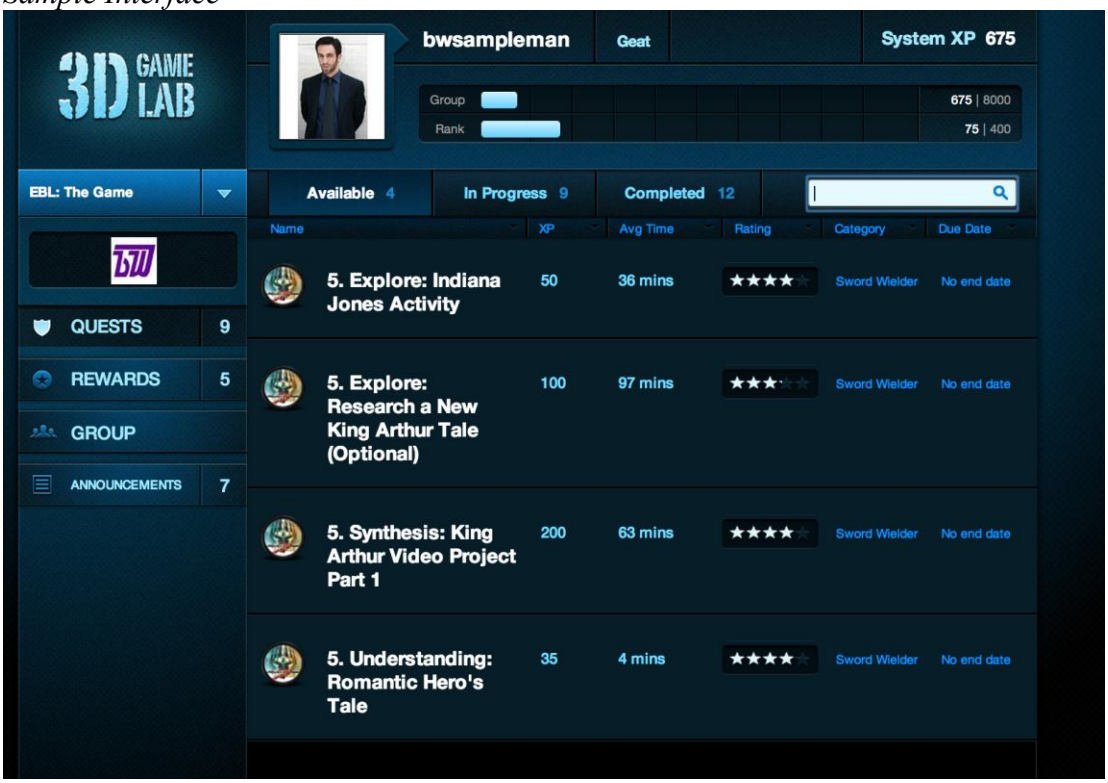
Figure 3:
Awards



Rewards were not required to successfully "win" the game, but served as an added motivational factor. All rewards were meant as both supplement to those who required assistance and enrichment for the gifted.

On a typical class day, the instructor would spend the first five minutes on basic announcements on the state of the game. He reviewed the suggested progress of the students, the suggested task of the day, and the upcoming dates for lessons to close. The instructor would then address frequently asked questions on current projects, and then ask the students to complete whichever tasks they were opting to complete for the day. Students would log on to the Game Lab and find the assignments. Below is a sample of the user interface:

Figure 4
Sample Interface



The user's total points were seen at the top, including the number of points needed to level-up along with the number of points needed to pass the course. In the main window, students saw the available quests in order to complete the QUESTT. Quests varied in completion time from a few minutes to several weeks, or from individual tasks to group efforts. While the content was housed on the computer, much of the work could and must have been completed collaboratively or on paper if needed. The GameLab was not a drill-and-practice system, merely a mechanism to delivery instructions, documents, and videos, as well as manage student achievement data. While students were encouraged to complete and submit their work on Google Drive for efficiency purposes, many students also chose a paper alternative.

In keeping with mastery grading, awarded experience point values were absolute in value. Quests that did not meet requirements are returned to the students with guided

notes for improvement (Bloom, 1984). Only when students had demonstrated mastery of at least 85% on a given assignment were they awarded the full XP amount and allowed to move on. (Note: 85% was an arbitrary value selected by the principal instructor for this course to maintain rigor while allowing margin for error. This value could be altered depending on the instructor, district, or content.)

The course proceeded at a minimum pace as set by the instructor with closing dates (dates after which quests cease to be available) but it was otherwise entirely student paced. Students earned the ability to advance to varying lessons, projects, or QUESTTS as they demonstrated mastery of previous information. As a result, a typical class was often asynchronous as different students are working on varying assignments on any given day.

Assessment Design:

As stated earlier, each QUESTT contained a mixture of direct instruction (Understanding), reading exploration (Explore), Project-Based Assessments (Synthesis), and individual formal assessments (Test). Understanding quests consisted of short videos created by the instructor along with required discussion questions or journal entries. Explore quests required discussion board entries, or completion of analysis questions. Project-based assessments made up the bulk of the unit in both time and effort. Students would typically spend two weeks on a project-based assignment, resulting in ultimately half of each quarter spent on larger projects. Projects were evaluated on students' ability to complete all required elements of the assignment, as well as the demonstration of mastery of the key unit questions. In comparison with the Gamified component, the synthesis is the "dungeon", which must be completed prior to the final boss (test

assignment). Such assignments required groups of three to five students with multiple stages and multiple roles. All assignments involved components of public speaking, presentation, literature, and technology.

In this given course, there were roughly 120 available quests, though only around 90 were required to receive full credit in the course and even fewer were required to pass the class. Students were able to complete either alternate assignments or optional assignments to supplement their ranks or compete with each other. Students who demonstrated profound aptitude could opt to create their own assignments in place of existing quests, or even created assignments for others to complete.

While the overall design was far more nuanced, this provides a basic overview of the key components to this Gamified course in action. The material for the course can be accessed at www.drharrold.com as of the publication of this study.

Research Design

The study was qualitative including the use observation data as well as individual interviews, and learning manage system (LMS) usage data. While not conforming fully to a traditional method, case study was perhaps the most congruent design with this proposed study. This project endeavored to answer two major areas: student perceptions of Gamified learning on the development of learning habits, as well as student motivational behaviors in the Gamified curriculum. These questions closely aligned with a case-study design, defined as "a qualitative approach in which the investigator explores a bounded system through detailed, in-depth data collection using multiple sources of data" (Cresswell, 2007, p. 73). The students sought to identify any and all effects of the

curriculum design on student perceptions, dispositions, behaviors, and completed work in a bounded system therefore case study served as the most appropriate design model.

Operationalization

This qualitative study sought to explore how the introduction of a Gamified learning system affects the way students were motivated both internally as evidenced by their own perceptions and externally as evidenced by their actions and ultimate completion of the work. For the purposes of this study, these terms are defined in the following way:

Self-Determination- A goal-directed mindset, which compels a student to accomplish tasks. This element of motivation can be internal or external, as well as positive or negative in nature. This study focused both on intrinsic and extrinsic levels of motivation as the latter often facilitates the former (Foregaurd, 2013). Self-Determination was measured qualitatively through observation data including class conduct, number of completed assignments, and dispositions in interviews.

Self-Efficacy- A student's perception of his/her own abilities and disposition towards a task, tool, or content. These perceptions consequently affect the student's performance either positively or negatively (Bandura, 1997).

Self-Regulation- A strategic behavior by students to systematically and deliberately accomplish a task including rehearsal, elaboration, organization, and critical thinking (Sadi, 2013). The demonstration of self-regulated learning strategies acts as a bridge between motivation/self-efficacy and achieving academic goals (Bandura, 1992).

Gamified Learning elements- Procedures, tasks, and norms established in the Gamified learning course, which separate it from a traditional curriculum design. Examples include

mastery-grading, asynchronous content delivery, online availability of content, emphasis on project-based learning, emphasis on collaboration, and others. Demonstration of any of these skills in any combination could qualify as higher order thinking.

Credibility

As this was a qualitative study, no quantitative instruments were used. According to Stenbacka, (2001) "the concept of reliability is even misleading in qualitative research. If a qualitative study is discussed with reliability as a criterion, the consequence is rather that the study is no good" (p. 552). Even so, precautions, however, were taken to yield credible results. If the validity or trustworthiness of data can be maximized or tested, then the more credible and defensible the result will be (Seale 1999; Johnson, 1997). In this study, potential bias was present through both the principal researcher, as well as the students. During the interview process, the instructor may have been biased towards selecting students who would provide more favorable answers than others. In order to counter this, the instructor selected students based primarily on their completed quests including an even mixture of males and females. Students who demonstrated high, moderate, and low levels of completed work were all selected for the study to limit the potential for instructor bias and provide a well-rounded sample. During interviews, students may have been biased towards providing falsely positive or negative responses to the instructor. To combat this concern, the instructor reminded the student prior to the student interviews that all answers were confidential, and had no bearing, positive or negative on the performance in the course. The instructor used predetermined questions (Appendix A), which asked concepts multiple times in order to verify validity of student responses. While this limited student bias, it may not have addressed all concerns. For

this reason, triangulation served as the primary method of assuring trustworthy data from the students and the researcher. Triangulation has shown to be "an important methodological issue in naturalistic and qualitative approaches to evaluation [in order to] control bias and establishing valid propositions because traditional scientific techniques are incompatible with this alternate epistemology" (Mathison, 1988, p. 13). The three measures of data collection, detailed in the following section, were:

1. Learning Management System Usage Data
2. Student observation data
3. Student interview responses

Of a class of thirty students, fourteen were observed semi-weekly through video recording. Class sessions last forty-five minutes therefore 90 minutes of video were acquired weekly over a nine-week time frame. As the principal investigator was a participant observer, it was necessary to record the course work and later take descriptive and reflective observations on the student behaviors. Due to logistical limitations, the instructor of the course was actually serving as the principal investigator for this project. It was, therefore, not possible for the instructor to teach and simultaneously collect observation data. For this reason, data was collected via video and observed following the conclusion of the course to limit observer contamination, and assure observation data had no effect on student scores. A copy of the observation protocol can be found in Appendix B.

Data mining from student learning management system usage also occurred including quests completed, and quests in-progress. In addition, students were asked to participate in an interview regarding their perceptions and dispositions towards the

Gamified course. Students were assured that the interview was voluntary and had no bearing on their grade. The interview questions avoided all mention on grade and performance towards the course and more specifically addressed the elements of the Gamified learning curriculum as well as student perception of their own abilities. A copy of the interview protocol can be found in Appendix A.

Differences sometimes arose between student perceptions, student actions in the classroom, and number of submitted quests. "In using triangulation of several data sources in quantitative research, any exception may lead to a disconfirmation of the hypothesis where exceptions in qualitative research are dealt to modify the theories and are fruitful" (Golafshani, 2003, p. 603). Construct credibility (Self-Determination, Self-Regulation, and Self-Efficacy) is heavily supported in the literature in Chapter II. The pursuit of these three behaviors is closely tied with student learning.

Following the completion of the study, the data was reviewed by Jason Draper, a qualitative data expert employed by Robert Morris University in the Ph.D. program who validated the findings were congruent with the collected information.

Population and Sampling

As stated, fourteen students were selected for the interview process based on their assignment-completion, and motivational learning behaviors. Originally fifteen students were selected, but one was removed from the course between the completion of the proposal and the data collection phase. While the population was convenient, the sampling was purposeful in pursuit of a diverse student population. Students were selected based on three factors: gender, number of assignments attempted (as measured by the LMS), and observational information from the instructor/principal investigator

prior to the start of the study. As the researcher and the instructor were one in the same in this study, the researcher was able to select students who had demonstrated high, moderate, and low levels of motivation throughout the course. The sample contained an even mixture of males and females, along with students who demonstrated high, moderate, and low levels of achievement and self-regulatory behavior based on the number of completed "quests" at the start of the study.

A diverse sample of students was vital for three reasons. Since, the first research question sought to understand how the course effects the Self-Determination, Self-Efficacy, and Self-Regulation, it was important to select students of varying levels so as to isolate these qualities. For examples, students with high levels of motivation prior to a Gamified course may have demonstrated high levels of Self-Determination, though this may have been a pre-existing condition. Students, who demonstrated lower levels of Self-Regulation might have still, in fact, improved from past courses. The diverse sample allowed the study to examine how Gamified learning affects these qualities, not merely the bottom line. This granted more credible results. Additionally, this study used equal numbers of males and females as there is past research suggesting gender may affect Gamified learning's impact on students. Bittick (2011) writes that while games and game narratives do have a positive impact on learning, games typically take on a masculine storyline and attributes which can be off-putting to female students. Past research has indicates that boys are more likely to have video games, and play video games much longer than girls (Kaplan, 1983; Dominick 1984). Though recent research (Barab et al. 2007; Dede et al. 2004; Joiner, 2011) has indicated there is no significant difference in Gamified learning's effect on student performance, a diverse gender sample removed this

concern. Though the difference in gender reactions to Gamified learning is beyond the scope of this study, more credible results can be yielded with an even mixture of males and females. Finally, a diverse sample was required as Gamified learning is itself diverse. One major game-element included in the system was freedom to fail, as well as multiple assignment options, meaning that students of different learning styles and abilities took different pathways through the course (Kapp, 2012). A diverse sample of ability levels was vital to get a sense of different course experiences. Grades were not to be a factor at any point in this study, nor were they to be collected during data mining. Parental consent was required for all students. While students had the right to opt out of the study at any time, no student opted to remove his/herself from the study.

Participants

The fourteen selected students were all participants in a College Preparation course, the middle difficulty level for the Senior English between "Core" (the lowest level) and "Advanced Placement" (the highest level). While students varied in motivational attitudes, academic skill, and learning habits, no students were in need of Special Education services. All students could be generally described as at least "grade level" for their reading, writing, and speaking skills. Even so, there was great variation within this range. Students were purposely selected to cover multiple levels of academic ability and motivation in an English classroom. All students were either seventeen or eighteen years old during the course of the study and lived in a suburban school district. For the purposes of the student, the fourteen students were identified as S1, S2, S3…S14. For a graphical representation of these categories, please consult Table 3 following the descriptions.

S1.

S1 was a female student who demonstrated high levels of motivation and academic ability prior to the study. She, along with S2, was in competition for the "lead" in the leaderboard for the course. Despite taking a number of Honors courses in other disciplines, she chooses to take the mid-level English, as literature and reading were not her favorite subjects. She preferred working alone prior to the study though could work with others if needed. She was selected as a student who showed strong motivational learning habits due to the quality of her work and her very high overall quest-count.

S2.

S2 was a male student who demonstrated high levels of motivation prior to the start of the study. His work consistently exceeded expectations and he made it a goal to complete the course prior to the end of the school year (a goal which was ultimately met). S2 demonstrated exceptional writing abilities for a student in college-prep English. He was selected as a student who showed extremely strong motivational learning habits due to the quality of his work and very high quest-count.

S3.

S3 was a male student who demonstrated average levels of motivational learning habits and work ethic prior to the study. His assignments were consistently submitted in a timely manner though he rarely participated in class or contributed in class discussions. He preferred to work alone and would often allow others to lead the group work. His academic performance was average in comparison with his classmates. He was selected as a student who showed average levels of motivational learning habits and moderate academic skill.

S4.

S4 was a male student who demonstrated high levels of motivation prior to the study. He spoke English as a second language though, despite the language barrier, demonstrated higher academic performance than many of his classmates. S4 frequently selected a work schedule significantly different from his classmates and often either worked alone or communicated poorly with group members. He was selected for his high levels of motivational learning habits and strong academic performance as evidenced by his high-quest count and class interactions.

S5.

S5 was a male student who demonstrated average levels of motivation in the college-prep English course. Despite taking advanced math and science classes, he would often remark English was not his favorite subject and performed at the middle of the pack. While submitting acceptable work, he would never work ahead, nor exceed the stated instructions. He was selected for his average motivational learning habits and moderate academic skill in English as evidenced by completing within the mean number of quests.

S6.

S6 was a female student who demonstrated average learning habits prior to the start of the study. S6 frequently asked questions in order to improve and perfect her assignments, though was also easily distracted during group work and independent working time. She demonstrated a high level of care in her work, yet was easily pulled off-task. Despite this in class, she always managed to complete her work in a timely manner. She was selected for the study due to this dichotomy, which resulted in moderate motivational learning habits and an average quest count.

S7.

S7 was a male student who demonstrated above-average academic performance and strong working habits. As a leader of his graduating class in extra-curricular events, this student was always in a positive mood and worked consistently during independent and group work. His academic performance met the required standards and he demonstrated strong levels of Self-Regulation. He was selected both for his high motivational learning habits coupled with his above average-academic performance.

S8.

S8 was a female student who demonstrated low levels of academic performance and weak motivational learning habits. Though her writing and reading skills were at grade-level, was frequently off-task, behind schedule, and distracting to classmates. She would frequently get off-track with S6 and other students, though struggled to return to the task at hand. She was selected due to her low number of completed quests and frequently distracted behavior.

S9.

S9 was a male student who demonstrated low levels of academic performance and motivational learning habits. Though S9 would ultimately submit work on time, he was frequently behind schedule, rarely asked questions, and kept to himself and most assignments. S9 also spoke English as a second language though still read and wrote at a comparable ability with his classmates. His performance had improved since the start of the year. He was selected due to his low quest-completion count and his moderate motivational learning habits.

S10.

S10 was a female student who demonstrated high levels of motivation and academic ability. Though she was behind the leaders S1 and S2, she frequently worked ahead in class, and often worked on assignments for other advanced courses. She rarely exceeded expectations academically but met all expectations ahead of time and consistently. She was selected due to her high quest-completion count and her strong motivational learning habits.

S11.

S11 was a male student with average academic ability and poor motivational learning habits. S11 was frequently absent, off-task, and almost never submitted work on time. He would frequently skip large assignments and attempt to improve his grade at the last minute. Though a very frequent contributor to class discussions and highly motivated in-group settings, he was not as consistent on his own. He was selected for his average question-completion count and his poor organizational learning habits.

S12.

S12 was a female student with strong motivational habits prior to the study. While completing an average number of quests prior to the study, S12 frequently asked questions to improve her score and went above and beyond all assignments she turned in. She did not frequently work well with others but demonstrated a strong motivation to submit quality work in all cases. She was selected for her above-average quest completion count and strong motivational learning habits.

S13.

S13 was a female student with low academic performance and poor motivational habits during the course. She was frequently absent and behind schedule in the course. Though her academic skills were at grade level, her work rarely met high standards. She was easily distracted during both group and individual work and only completed assignments when under pressure towards the end of the quarter. She was selected for her low quest-count and her lower academic performance.

S14.

S14 was a female student with average academic performance and average question completion. Her work met course expectations and she worked consistently on pace, never straying far ahead or behind schedule. She did not contribute to large group discussion and preferred small group work. Essentially, she was selected precisely for her ability to blend in. She was chosen due to her average performance and quest completion.

Table 3:
Participant Selection Breakdown

	High Quest Count	Moderate Quest Count	Low Quest Count
Strong Motivation	*S1,* **S2, S4,** *S10*	**S7**, *S12*	N/A
Moderate Motivation	N/A	**S3, S5,** *S6 S14,*	**S9**
Poor Motivation	N/A	**S11**	*S8, S13*

Male Students in **Bold,** Female Students in *Italics*

Data Collection

Twice weekly, the principal investigator video recorded the forty-five minute course. While only fourteen students were interviewed, all students were video recorded for

observation purposes in order to better understanding the functioning of a class as whole, not merely individual reflections. In general, observations were collected on Tuesdays and Thursdays however this was adjusted as necessary. Due to the positioning of the camera, and the size of the room, and the fact thirty individuals were working and talking concurrently, it was necessary to film from multiple angle to get a complete picture. For example, it was difficult to see a student's face, and the contents of his/her computer screen at the same time. For this reason, the camera was placed in a different corner for each recording sessions to assure that all students would be seen and heard in a balanced manner. Though all present students were visible in each observation, some were more visible than others. All forms of direct instruction, and full class participation were transcribed when available. For example, when students asked the instructor, or each other questions, and groups collaborated on projects, these tasks were recorded. When students were off-task and engaged in personal conversations, the specific details were not recorded word for word, though the nature of their conversation noted. Every few minutes, or more frequently if appropriate, a description of the interviewed students was recorded including their conduct, demeanor, interactions with others, and general time on-task. This was done, as many of the behaviors were consistent throughout a forty-five minute period. It was not uncommon to have a student sit and work silently on an assignment for the entire class, or a group of students working collaboratively but quietly for the bulk of the period. As data was collected, patterns began to emerge on class's working habits and individual protocols. These are discussed along with interview data and used to inform the researcher's understanding of the students' working habits.

Field notes were taken wherein the principal observer documented the class in action. Some elements which were covered in a field observation included portraits of the subjects, reconstruction of dialogue, description of the physical setting, accounts of particular events, description of activities, and the instructor's behavior (Bogdan, 2007, p. 123). Descriptive notes sought to create a functional description of a Gamified classroom in action. Field notes later were supplemented with reflective notes, which include thoughts, ideas, questions, and concerns from the principal investigator using the Observation protocol (Appendix B). Reflective notes focus on reflections on analysis and reflections on the observer's frame of mind, as well as points of clarification (Bogdan, 2007, p. 124). These findings were used in combination with interview responses to get a sense of student motivation, efficacy, and regulation on a day-to-day basis. Video recordings were stored only the principal investigator's computer and viewed only by the principal investigator. All video recordings were password protected on an external hard drive and will be digitally shredded after five years.

Interviews occurred outside of class time at the convenience of the interviewee. The interviewer asked a series of ten pre-determined questions as well as follow-up questions which arose during the process (Appendix A). Interviews lasted roughly thirty minutes but varied in length based on student responses. Interview questions focused on students' perceptions of the course and their learning habits. The sessions were audio recorded and ultimately transcribed for content. Audio recordings were password protected on the principal investigator's computer, along with transcripts. Students being interviewed were assigned a numerical identification code and no personal identification information will be recorded.

Learning Management system data was collected at both the beginning and end of the observation period. This data was mined from the "Report" function of the 3D Game Lab. Neither grades, nor assessments were collected. Collected data included the total number of "quests" a student has completed.

Quest Completion

Using the 3D-Game Lab software, a report on student assignment (quest) completion was run at the beginning of the study (February 21, 2014), and at the end of the school year. Initially, quest completion was used to help determine which students should be selected for interviews. In effort to select a diverse sample, an even number of males and females were selected (seven per gender) as well as students who demonstrated high, average, and low levels of quests completed. Five students from above the mean, three below, and six within the standard deviation were selected. A fifteenth student was originally selected but he left the class prior to his interview. See Table 4 for a breakdown of students:

Table 4:
Quests Completed Through 2/22/2014

Name	Gender	Quests Completed	Relation to Mean/SD
1	F	81	Above
2	M	93	Above
3	M	64	Average
4	M	73	Above
5	M	62	Average
6	F	66	Average
7	M	67	Average
8	F	59	Below
9	M	56	Below
10	F	73	Above
11	M	66	Average
12	F	73	Above

13	F	59	Below
14	F	64	Average

Mean Quests Completed (Full Class, all Year)= 65.9, SD 7.7

Following the interviews, observation data, and completion of the course, the total quest completion for the end of the year was collected. With these final quest completion numbers, the cumulative number of quests completed during the study, as well as the percentage of total quests submitted was calculated in order to measure just how much student work was successfully submitted and approved during the final quarter of the school year. These numbers provided insight into the results of the student working habits throughout the fourth quarter, as well as residual progress from earlier in the year. See Table 5 for results.

Table 5
Quest Completion Through 6/6/2014

Student Number	M/F	Quests (2/22)	Quests (6/10)	Quests completed 2/22-6/10	Percentage Completed in during the study	Relation to SD of % Completed 27+/- 3.4
1	F	81	118	37	31.36%	Above
2	M	93	120	27	22.5%	Below
3	M	64	91	27	29.67%	Within
4	M	73	109	36	33.03%	Above
5	M	62	90	28	31.11%	Above
6	F	66	90	24	26.67%	Within
7	M	67	92	25	27.17%	Within
8	F	59	83	24	28.92%	Within
9	M	56	78	22	28.21%	Within
10	F	73	96	23	23.96%	Within
11	M	66	91	25	27.47%	Within
12	F	73	81	18	22.22%	Below
13	F	59	76	17	22.37%	Below
14	F	64	84	20	23.80%	Within

This data was later combined with student observation data and student interview data in order to construct a more accurate picture of a students conduct and drive in a Gamified class.

Analysis

Video observations were observed after the school year had ended and the students had graduated, both to give the teacher/researcher a fresh perspective from the original events, and to weaken the probability of bias. This timing assured the researcher would not allow the study's data to impact his role as a teacher, nor be compelled to alter his teaching to fit the data. The researcher then observed the video recordings and took field notes on the events of each class. Observations included the description of the physical space, general class conduct, time on task, specific behavior of S1 through S14, instructor conduct, and transcribed conversations when applicable. When possible, such as during direct-instruction sessions, class sessions were transcribed verbatim including both instructor lecture notes and student comments. As the vast majority of the class sessions consisted of students working independently or in small groups, this was not always practical. In these cases, only changes in student behavior were primarily recorded. For example, if a student worked independently the entire period, this could be recorded in a single sentence. It was redundant to continually write "S1 works alone" every minute, however if a student was continually asking questions, getting off task, or engaging in personal conversations, all of this information was indicated. Conversations of a personal nature were not transcribed, though it was noted that a student was "off-task", while conversations germane to course content was transcribed. Only interviewed students were monitored closely (S1…S14) while the rest were used only in relation to

the students in the study, or described generally as a whole (i.e. one group presents their satire project while the rest of the class silently takes notes). Once descriptive notes were taken for the eighteen sessions, reflective codes were taken on each recorded change or event. Reflective codes included the researcher's thoughts on the events witnessed as related to the students' overall conduct and motivational learning behaviors.

These reflective codes were then filtered by student (S1, S2,…S14) in order to create a description of each student's overall behavior patterns through the nine weeks. While all behaviors were taken into account, the behaviors most specifically noted included the perceived student motivation towards completing tasks (Self-Determination), organizational skills and time-on-task (Self-Regulation), and the ability to complete assignments, either alone or with instructor/peer assistance (Self-Efficacy). While it was difficult to visually ascertain a student's perception towards the course, a student's overall demeanor was also noted. Ultimately, all observation data was distilled into Appendix C, which provides an overview of each student's positive, negative, and most frequent behaviors though the study. Additionally, specific comments and behavior were sorted by research question and discussed in Chapter 4 alongside the interview data. This chart (Appendix C) was also used in conjunction with student interview data to better understand a student's thoughts and actions while engaged in a Gamified English course.

Following observation coding, interviews were transcribed and were coded for key points, and ultimately sorted in major concepts using what Saldana (2009) refers to as cycles of coding (p. 45). Interview data was divided into the corresponding research question it address, including the three sub-sections of question 1 (Self-Determination,

Self-Efficacy, Self-Regulation) as well as the positive and negative of question 2 (Perception). Following this initial cycle, the researcher used Descriptive Coding, which "summarized in a short word or phrase – most often a noun – the basic topic of a passage of qualitative data" (Saldana, 2009, p. 70). Here, data from the LMS, as well as observation data was merged with interview responses to seek an understanding of the student's general conduct in relationship with the their responses. Finally, responses, observation, and quest completion data was synthesized using Pattern Coding in which all elements were used to address the primary research questions (Saldana, 2009). While concepts could be predetermined, it is also acceptable to determine concepts as a result of the data presented (Lichtman, 2013). These themes were compared with themes from the interviews and the LMS data. LMS data was matched with student responses, and student observation to search for congruency (or lack thereof) between student perceptions, behaviors, and ultimately their actions.

In analyzing interview and observation data, there was risk of bias as the primary investigator is also the instructor of the course. If the findings had yielded unclear conclusions, the primary investigator was prepared to share data sets with another university expert in order to reach an unbiased reflection. For example, if a series of interview responses or descriptive notes lacked a clear code or theme, the principal investigator would have isolated the appropriate raw data (interview answers, or descriptions) and asked a third party to assess if there is a clear pattern. A researcher with a terminal degree and experience in Gamified learning would be selected in order that proper context could be provided to the analysis. This provision was not anticipated, and ultimately not utilized, though Jason Draper of Robert Morris University, as a third-

party reviewer, validated the data.

In order to validate the data, Mr. Draper was given the coded interview transcripts from all fourteen students, the observation protocols from the course observations, Appendix C, D, E, F, and G, which served as intermediate steps from the raw data to the full presentation of findings, and Chapter IV of this dissertation. An original copy of the LMS data was not needed as it appears in Chapter III. Mr. Draper examined the raw data to ensure there was a logical and unbiased arrangement of raw data in the appendices, and that the data was appropriately represented in Chapter IV. After reviewing these items, Mr. Draper found, in his own words, "no problems in the alignment of the raw data collected, the aggregations and summaries of that data, and ultimately the narrative of your Chapter IV." He further stated this was "comprehensive and exhaustive work". While Mr. Draper was not an expert in Gamification, he was employed by Robert Morris University to assist doctoral students with ensuring their studies are credible using both qualitative and quantitative. Mr. Draper's validation of the logical arrangement and fair reporting of raw data further diminishes the probability of bias by the researcher.

Following the transcription of interviews by the principal researcher, and collection of descriptive and reflective notes, interviews were coded response by response for themes, patterns, and connections. Behavior patterns were compared with student perceptions and interview responses. Additionally, observation data provided insight into the functionality of the Gamified course as a whole. Both descriptive and reflective data were used to construct an understanding of how a Gamified learning classroom functions and what patterns in student participation, engagement, and motivation emerged. Data

examined the totality of the group, as well the performance, reaction, and disposition of students.

Recurring themes amongst all three data collection methods were synthesized in pursuit of an answer to the main research questions: 1. What effect does Gamified learning have on student motivational learning habits including Self-Determination, Self-Efficacy, and Self-Regulation? and 2. What are student perceptions of Gamified learning?

Schedule

The Gamified learning curriculum had been in place for nearly one year prior to the start of the study. Student observations will occur semi-weekly from the last week of February 2014 through the first week of May 2014.

Summary

The Gamified curriculum was designed to appeal to student's interest, and improve learning habits, which can increase motivation, self-efficacy, and self-regulated learning, and well as higher order thinking. This study was designed to investigate the effects of such a curriculum on Self-Regulation, Self-Efficacy, and Self-Determination. The study will also interview students to learn their disposition towards the various elements of the Gamified course. Triangulation was the primary method of assuring credibility as "researchers search for convergence among multiple and different sources of information to form themes or categories in a study" (Creswell & Miller, 2000, p. 126). The synthesis of this information has provided a glimpse at the practical effects of working model of the Gamified learning design. A combination of student perception, documented achievement, and observations provided a clear understanding of the effects of a

Gamified curriculum on a diverse sample of students. For a summary of the findings, as well as an analysis of its implication, consult Chapter IV and Chapter V respectively.

Chapter IV: Findings

Introduction

This qualitative case study sought to gain insight into how a Gamified English class affects student motivational learning habits, as well gauge the student perception of Gamification in course structure. Three forms of data were collected to achieve a cohesive, triangulated picture of Gamification in action. Of a class of thirty students, fourteen students were purposely selected in order to achieve a diverse sample of students both in gender and past performance. These fourteen students were interviewed for one half-hour session, observed semi-weekly over a nine-week period, and data was collected on the number of quests they completed in this time frame. These students were asked about their habits prior to the course, their positive and negative perceptions of the course, their views on how the course differed from traditional classes, and their commentary on specific assignments and types of lessons. To conclude each interview, students were asked what one thing they would change about the Gamified course if possible. The remaining sixteen students in the class were included in general observations, but not interviewed. All students, and their parents, signed a consent form regardless of whether they were interviewed or not. This chapter presents a synthesis of these three types of data as they relate to the two major research questions.

This chapter is split into three major categories, Internal Perspectives and External Perspectives, with four themes each, and Combined Findings, with three overarching common threads. Internal Perspectives are derived primarily from interview data, with some supportive observational notes, while External Perspectives relies more heavily on observation data. These themes, or patterns, arose from the data, and were ultimately used to better understand the effects of Gamification on student motivational learning

habits, as well as their overall perception. At the conclusion of each section, a summary is included for reference to complete the context of the student responses.

Throughout the chapter, the fourteen interviewed students will be referred to as S1, S2, S3…S14 in place of their names. Any names mentioned in student responses have been replaced with pseudonyms. Aside from these changes, student responses have been transcribed as originally dictated.

Internal Perspectives

While the quest-completion was used primarily to select student participants, it was the interview and observation data, which yielded clear themes and patterns addressing the research questions. For the purposes of this study, the terms "theme" and "pattern" are used synonymously. The following sections explore the major themes primarily derived from the students' personal views and reflections. It should be noted that observation data was consulted and at times mentioned as a means of verifying these themes. For more information on student responses, consult Appendix D, E, F, and G for individual student summaries pertaining to different types of questions. The following chart, Table 6, provides a quick over for the major themes.

Table 6
Internal Perspective Themes

Primary data	**Themes**			
Interview Data	**Theme A1**: Game Elements lead to stronger conceptualization of progress	**Theme A2**: Customization has a strong effect on ownership	**Theme A3:** Daily autonomy leads to lower stress and increased sense of responsibility	**Theme A4:** Lack of perceived equity among some students

A1. Game elements lead to stronger conceptualization of progress

The first pattern to emerge from the students was the role of the "game elements" themselves in student conceptualization of progress. S1, a highly motivated student even prior to taking this course, stated:

> I feel like I was more motivated to complete the tasks because, um, with completing a task in a regular English class it's just 'oh hey, here's your grade' but in this one there was more a reward for completing more tasks…and I think that really had a benefit. And also, I think it was more interesting. There was more of a reason to complete them1 and I think that really made me want to do more of them, and it made me want to do them faster, and it made me want to do them better.

S10, another student highly motivated in many aspects, echoed these sentiments by saying "I really like 3-D GameLab, I like being able to submit it. I feel like I'm accomplishing things sometimes because it dings, and it's one more thing off the checklist. I do like 3-D GameLab." Even the elements as simple as a sound go to improve motivation. Additionally, she mentioned that the game elements had been motivating throughout the year. "I look at the XP, on the leaderboard, to see who's rated what. Because competition, I'm in competition with [John], trying to get above him" (S10). Finally, S2 stated he enjoyed the game-elements as a motivational feature:

> I like the entire thing, I like the levels because it's like a video game and it appeals to a lot of the students because students play video games. Some people who play videogames might not like it, but I like the levels and getting different

> names and awards and stuff. I like that because it gives you like a boost of confidence that you got something different and new.

It is worth noting that many of the students in question who specifically cited the motivational value of game-elements had already stated they were highly motivated and demonstrated driven behaviors while in class. On the other side of the motivational continuum, many students who had previously been unmotivated felt the Gamified class granted them a stronger sense of visualization and concrete understanding for their progress. S9, a student frequently off task early on in the course but one who made great strides towards the final weeks, stated:

> It makes you feel like you were learning more because, I know you can just come to see this paper is 75% of your grade but just seeing 100 XP and 75 XP makes you feel better, especially if you're like a gamer or something like that. I wouldn't say I'm a big gamer or anything like that, but I play videogames like everybody else.

The use of experience points as a tangible element stood out as more valuable than a percentage. This student was able to "see" 100XP and "feel" is if he was earning more. The tangible element proved more valuable. S8, a student who typically struggled with motivating herself in past classes, said:

> Yeah, definitely. I'm much more motivated, because you want to get that point value, and for the other grades, you're not sure if this project will get you all the way up to that "A" that you want, but in this class you know exactly how much everything is worth. You know all the point values so if you do this project you are going to get that "A".

While S8 still struggled to stay on-task throughout the class, she completed an average number of quests and was frequently done on time. This was a sharp increase from her working habits in previous courses. Again, the more concrete relationship with progress in the form of XP proved more valuable. Another student, S13, who also noted low motivation in the past, confessed:

> I'm not sure, but I like how the instructor always gives us a goal we need to reach each quarter, because I know what I need to do and it is not like us calculating our grades like 'oh if I do bad on this test, what grade will I get?' It's like finishing it, and you know what you need to accomplish to succeed.

The idea of "knowing" what needs to be accomplished stands out. The ability to conceptualize the necessary tasks to accomplish goals appealed to those who might otherwise be confused. Another expressed value in XP over standard percentages stating "it's with more motivation, because you can finish, or get more XP at a certain time. That way in your head you can be ahead, instead of always being behind to try to catch up" (S3). By converting learning objectives into a tangible deliverable, these students felt there was more to achieve. S11 summarized it best by stating:

> I just like the overall design. It's totally different than anything we are used to. I like that I can see my progress. You can't see your progress in a normal class. I mean, you can see your grade, but here you can see your progress. If you can see your progress and how it's getting done, that makes it more like you know what you need to do.

Design and the ability to "see" with transparency were beneficial to a number of students. S11 continued by stating:

> It is the most motivated class I'm in right now because I actually like… Because I know it's something I can do. I know I can go on and can be like 'okay I can get this done, I want to start this. I need to get this done' like I will need to work towards this.

In closing, Game elements served as a motivational tool for some, and a method of visualizing progress for others. These elements appealed to students of diversely motivated background.

A2. Customization has a strong effect on student ownership

Beyond perhaps surface level motivational elements, many students felt the Gamified classroom offered an increased sense of ownership of one's own work, one of the key elements of Self-Determination. S5, who outright stated he felt no increase in his motivation, did say:

> I really liked the game has customization ability. You could do your own thing. I like how you don't have to do every single assignment to get an "A". You can pick and choose and do some bonus assignments and that will cover up the bad assignment with a 'not-done' main assignment. Which is good in my opinion. Doing everything, following everything down to the letter is kind of boring, if you're just following the same path… But this you can do your own thing and that's nice.

Despite not actively pursuing the game-elements and badges and, admittedly, not attempting to "win" the contest, S5 noted he could "do his own thing". Other students, both previously motivated, and those who struggled, voiced the same concerns stating:

> I think that now, because there is [no due dates], it's my choice that I do it. And I like that because it puts it all on me. I don't have to stress and do it in class I can take my time and do it right. As compared to doing it in class and trying to finish it and just getting it done (S11).

The student infers a level of Self-Determination as its now "on him" to completed the tasks. S12, a student who performed well prior to this study though slacked off towards the end, stated:

> I feel more motivated. I feel like this English class I like more. Because previous English classes, I had to sit there, and read from the book, and read as a class. She would call from someone and say 'okay you read this one' and the quizzes on the books, like…like those affected my grade in a bad way. Because you really have to like memorize the information in the books. For this class, you do the assignment, where you know it, but you don't have to like know it from the inside out, so it's more comfortable.

The ability to do the assignment to "know it" rather than know it on the instructors terms have led to a more motivated experience. S11 espoused the practicality of having access at home:

> None of that other [classes] I can relearn and pay attention to, and here I can go back and be like, I can go into this and pay attention. Even if I didn't pay attention all day, I can go home, and if I'm in a better mood to like do it, I can do it at home. I can't relearn the calculus of home; I can learn my English at home.

The ability to learn in the face of fluctuating mood proves valuable for this teenager. Finally, S2 cited the practically of Gamification's focus on ownership saying:

> I think it's made me more motivated to do it. I think it almost prepares you for the real. In the real world, you won't have thirty students that you will have to drag with you; it will just be you.

Ownership then has emerged as a clear pattern amongst student perceptions of their motivational changes.

While procrastination was the most commonly cited flaw in many students' existing workflows prior to this course, many students felt the lack of hard due dates and volume of work inspired and/or forced them to regulate themselves more than in the past, especially if they were making it a goal to perform at a high level in this course. S1, a highly organized student stated:

> And for me, it just caused me to do even more planning because I saw what was all ahead and I saw what I needed to do and it gave me even more time I think because I didn't have to just focus for a week on the background of it, I could focus on the content of it instead.

S1 quickly saw the need to plan things in advance because he finally had the ability to move quickly through easy things. S7 felt similarly by saying:

> Like we have a lot of work, so you don't want to wait until the end, because you always have those times that people are putting in on the website itself, so you know just how long it's going to take. And then you can judge how long it's going to take you based off of that. So looking at that, you don't take too long. To try to break it down, get everything done in a reasonable amount of time.

S7 even took it step further to use the game-elements in the software to manage his time. S10, another organized student stated, **"**I think it may be more organized. I still have to

keep pace with the class. So I still keep on track, so I'm still organized in this class." Despite already being organized in general, these students felt the challenge of tackling the main quests, along with other elements led to strengthen their regulation. S3, a student who procrastinated prior to the class concurred by saying "I would say it's about the same, it depends on the day. If you need to accomplish more to get ahead, then you can do better than." Students saw a necessity in many cases to organize themselves in order to succeed beyond the minimum requirements. In short, the course design, along with the lack of formal deadlines provides the potential for procrastination, but also increased ownership for students and the content.

A3. Daily autonomy lowers stress and raises responsibility

Another major pattern students discussed in the interviews was the mastery grading system's effect on their confidence levels. Specifically, this grading system allowed students lower levels of stress and greater levels of responsibility simultaneously. This system allowed for incorrect work to be corrected for all assignments scored at under 85%. Students who did not meet this mark were given assignments back and asked to improve them to demonstrate learning. More simply, it was "that second chance with everything. We make mistakes, but for papers personally, yeah I do like that woopsie-daisy fix option that its there if I need it" (S6). S1 felt the system made her more confident because:

> I could maybe try different things and experiment with an English class that maybe I wouldn't have tried in the past because I wouldn't have known how the teacher would react to it, or if they would have said 'no, you can't do that.'

S2, a student who mentioned he had struggled with poetry in the past, said he felt more confident with poetry this year:

> You had to pick several poems and dissect them and just evaluate everything about them, like patterns in rhyme scheme, and what they mean everything. And I sent that in and I wasn't positive I was good to do the job but I still said it in because I wanted the points and I wanted to move on because and not that big a fan of poetry. I think that was one of the only times.

S9 recalled a time when he struggled on an assignment was able to fix it for full credit:

> But the instructor said it was pretty good, and told me to add some stuff into it and send it back in so I was like "all right, I added some stuff into it" and then made it better. So yeah it gives you more confidence. You know you're going to… You know if it's not good enough you can do better.

S3, and others, realized this was just a way to recover from bad grades, but the ability to learn more. "I would say more confident because if you do it wrong, you can learn from what you did and then you can make it better. Then you feel better about yourself because you did something that is actually worthwhile." Even S14, and others who did feel a sharp increase in confidence still acknowledged its value in their learning. "I feel just as confident. In fact, maybe a little bit more because, like I said, if you don't do well, you can turn it in again and learn from your mistakes". S10 summarized the mastery system saying:

> I [was] more confident, because I know that…because in other classes you have to do things specifically to the rubric, and you have to get ABC D or F, but here, as long as you perform above the mastery level, you're good, as long as you show

> you understand what's going on, that's why few more competent because the instructor sees that we know, even if we didn't do 100%, we still know.

The "safety net" of the Mastery Grading offered many students of diverse personalities lower levels of stress. This was additionally reflected in the final "quest-count" from the LMS data. Despite the fact some students were behind, demonstrated lower levels of academic ability, and procrastinated, nearly all students were ultimately able to complete an average number of assignments throughout the quarter. The "safety net" allowed the struggling students the chance to bounce back. This improved confidence led to a noticeable lack of stress among the students.

When asked what element of the course they found most beneficial, all interviewed students responded that it was the "freedom" that they valued most. Even so, the students did not value this freedom just because they could do whatever they chose, but because they had the responsibility to succeed. S6, a student who struggled with anxiety and constantly asks questions says:

> I like this set up. I really feel like everybody should start doing this just because it's a big stress reliever from other kids. Of course for some kids though always think, oh I don't have to do this right now. Depending on the person, like me I feel like everybody should start doing something like this.

For her, freedom is not about working more, but the agency to manage her own time. S10, another student with a heavy course load agrees with the value in flexibility:

> Definitely the time, because… This is been my favorite English class by far because with all the AP classes that I'm taking, some nights I have to study for my AP tests and I don't get to do other subjects, like English, but whenever I don't

> have a lot to do in my AP classes, whenever I have a break, I can get a lot done in English and get ahead, and then not stress over being behind when I have a lot to do in other classes.

S11, and S12, had lighter course-loads, yet felt the ability to work in different places and at different paces leads to a more comfortable working environment:

> I like the freedom. I like that you can do everything that you can do in class at home. And I like that because I don't feel like I have to do everything here, and that I have to rush my work. I like that it is like, I can start it here in then, and go to the bathroom, come back, go on the bus, with the thing you can work on it anywhere. (S11)

S12 simply agreed by saying "I don't feel pressured, I feel like I can just do it. You know how like I said in the beginning that I motivated". Whether a student enjoyed working ahead, learning life skills, or simply managing their busy high school life, the first and most evident positive element of this course was the freedom and flexible schedule.

Another trait, which was valued by students, was the ability to take responsibility for their own learning. Despite having to do work, many students indicated they appreciated the challenge and duty of having to take responsibility for when to complete their work. S3 states simply that "it's on you" to set your own schedule. S8, though not always on task, saw value in having the ability to plan her schedule:

> I like that that… I am more on my own… And that prepares us for college or something, because it's not like 'do this this, this, and this' is you have to like, like do it on your own. And you have options to do so you can decide what you want. You can do one at a time, or you can do other things.

The ability to choose seemingly makes the assignments more palatable than being forced to pick one. S14 saw value in learning from your mistakes on older assignments:

> I like the whole GameLab thing in general. I like that you can turn in a lot of stuff when you want to get it done. I also like the fact that you can redo it if you don't do well. I mean, you do learn from it a lot of the time if you mess up on a paper and fix it I think it's very beneficial.

The freedom to fail and improve on the past allowed her to learn from her errors. S7 felt the same as he discusses his unhappiness with a typical class:

> I think that makes you learn a lot better, because in a normal English class to get that paper and you get your reflection. I never thought that was any help. Because you see at one time, you write down your thoughts, you do it in ten minutes because you want to get done with it, and then you never see it again. I think that this, you get the paper back, change it, and if you do it wrong again you get it back again.

He even went so far as to discuss how the course prepares students with life skills for the future. “One thing I liked the freedom. I think that's going to prepare us for college, just because you have more time and it's a lot in your own time. There's a lot more responsibility that you have a student” (S7). S1 saw value in personal responsibility and choice leading to a more meaningful assignment:

> That was one that I liked personally because there were so many options. You weren’t limited to just having to research a new tale and teach it. And I think that was really beneficial because then I think people who might not have understood what Chaucer was writing could do something else and maybe try it themselves.

> And for me I think that was maybe the most beneficial because you weren't so limited and you could kind of expand on it and do something slightly different with it.

The freedom to choose when to complete assignments and which assignments to complete offer intangibles beyond an improved grade. Students referenced how these skills will lead to better writing skills in college and a greater ability to manage time. In fact, simply removing the stigma on returned work seemed to offer a greater sense of meaning to some students, as they are now able to learn from their mistakes rather than forgetting them immediately. Analyzing student responses, the ability to manage one's own learning, progress, improvement, and schedule makes learning a much more enjoyable process as its nearly voluntary, far more customized, and therefore more authentic.

A4. Lack of perceived equity among some students

The most common complaint amongst the student was a lack of punishment for those who did not work as hard. Under a mastery system, as long as students get 85%, they are given full points on a given assignment. S1 commented:

> There might be some people who might not do these larger assignments, but then they would still, because of the way it's set up, they would still get an "A" because they got the experience points and for me that just seemed a little unfair because of, like the amount of work that someone else was putting in."

S2, another student who went above and beyond, stated:

> Yeah like sometimes I hear about, maybe it was the King Arthur paper, or one of those. Somebody just didn't do it and thought; 'oh I'm just going to get the 4000

> points so it doesn't really matter because I will get the A'. I don't think they deserve the A because they just blew it off.

This sentiment was reflected in a number of higher performing students who felt that the mastery grading allowed some students to achieve the same letter grade despite not performing as well on specific assignments. S7, a student who performed above average in points and quests felt that more punishment was in order:

> Just like the kids that I see that really don't… that slack a lot, something a little bit could be changed for that. But honestly I feel like that starts at home… But that's beside the point. Maybe something for those kids just to give them a little extra motivation, or little punishment they don't do something.

S12 echoed these comments by requesting the course be less lenient:

> I would probably make it less group orientated. I would be stricter on papers, really strict on due dates, like yet you are still on your own, but you still have to set a goal and a date for yourself. And I would make it so the quest is closed like two days from now.

While all of these students, and others, valued the freedom and flexibility for themselves, they wanted a sense of justice and equity they felt was lacking.

Summary of Internal Perspectives

In brief, students who saw themselves as highly motivated prior to the course were further motivated with the use of game-elements. They found the ability to see their progress as success in a video game to be more rewarding and engaging. Additionally, many found the simple availability of content as a result of the course's design to be engaging on its own. The freedom to move ahead without waiting for others increased a

sense of conceptualization of progress. Many other students at the lower end of the motivational scale found that Gamification's visualization of progress allowed them the ability process their path forward. By conceptualizing assignments as XP to be earned, rather than mistakes to be avoided, these students felt more inspired to finish assignments. Additionally, these previously less-motivated students concrete understanding of their work as a physical, visual entity to be seen on a status bar, rather than a portion of a confusion algorithm.

Further, a diverse group of students felt the course, beyond the superficial, led to a greater sense of content ownership. The flexibility of assignment pace and type led to an increased sense of choice, customization, and personalization. Additionally, the mastery grading system inspired students to take risks on new material, make attempts on confusing material, which consequently led to lower stress and greater responsibility. While positive perceptions dominated the conversation, the Gamified remains imperfect as it was perceived as too lenient towards slackers by some, too dependent on technology, and leads to personality conflicts. Each of these negatives stood in ironic contrast to other positives in the course as well. For example, students valued the freedom, but do not seem to like others have too much flexibility. Students enjoyed skipping a paper if they have earned it, but do not enjoy others following the same pattern. In all, these patterns via the students' personal perspective offer insight into the roles of Gamification on Self-Determination, Self-Regulation, Self-Efficacy, and Perceptions.

External Perspectives

Beyond the student perspective alone, the external observations provided key insight into the students learning habits on a typical day. Over the course of a nine-week

period, the students displayed a number of working patterns, many which were validated in the interviews as well. For a more detailed view of individual student habits during the observations, consult Appendix C, which includes frequent habits, as well as positives and negatives for each student. What follows were the key themes and patterns for the externals perspectives. At times, quotes from the interviews are used to validate and enforce these trends. Table 7, below, reveals four themes derived primarily from the observation sessions.

Table 7
External Perspective Themes

Primary Data Set	**Themes**			
Observation Data	**Theme B1:** Work is consistent but not constant	**Theme B2:** Collaboration increases student engagement	**Theme B3:** Students independently engaged without direct instruction	**Theme B4:** Human conflicts and preferences can hinder learning

B1. Work is consistent but not constant

As stated in the earlier themes, students displayed a good deal of autonomy, freedom, and responsibility in creating their own workflows in the class. At the beginning of each period, there were a few hectic minutes of noise and discussion as students settled into their tables and the instructor discussed the goals for the day. Once the initial chaos had settled, students separated into different patterns. Highly self-regulated students launched into conversations such as "How many bonus assignments have you done? (S1)" and "I haven't tried that quest yet, how is it? (S6)" or "I only need to submit one request and then I'll be caught up (S13)". It was clear that, detached from the direct instruction, students found ways to stay on-task. Some students, specifically S5, S8, S13, and S14, would seriously procrastinate to begin assignments or activities. As

students are able to choose their own schedules, it was not uncommon for time to be wasted before it is used wisely.

While there were many variations, typically students would either be working individually, or on a group project. During all group sessions, students would state things like “this quote seems funny but it's really not been a be that interesting (S7)” or “I think the themes of these actually end up being the same (S11).” These conversations, much more frequent during project-based assignments, demonstrated an ability to answer questions separate from the instructor. While initially messy, there were clear patterns of organization, both in time and quality, led by the many students as a result of the collaboration. This is in contrast to when students were working on outlines or drafting for their final research paper in the computer lab. In these cases, the average student was off-task half the time, even students like S7 and S1 who were almost always engaged in other tasks. Students would work for a minute, chat for a minute, work for a minute, and then repeat. As a result, it was fair to say that the work was consistent, following a pattern of work and non-work, but not always constant.

The off-task students were split in three ways between those who were behind or off-task, students who were far ahead and working on new assignments, or students who were opting to complete English another time and working on a different class’s materials. This was evidenced visually at times, for example when S5 and S2 would work on calculus instead of English, and other times evidenced through interviews. Despite this “messiness”, a clear majority of students were working on the same thing at the same time. In order to stay on pace, students relied on the instructor’s directives, peer assistance, or simply observational clues. One student later described it was:

> I just kind of like look at where everybody else's. I kind of want to be on the same page, and maybe a little bit ahead, so I just go with that. And I go with when we have to have our points by. Where everybody else is… But I just kind of tried to stay where everybody else is (S13).

The large goal of "staying with others" leads her to create her own steps to keep pace. S11 stated more directly:

> I would like long-term goals rather than short-term goals, and I know, I know I have been saying I'm lazy but I would like to do the work because I can see… It's like if I have a long-term goal, I will set up my own short-term goals to get it done. Because that's what I like, I can do my own thing.

For students both previously organized, and those who struggled with it, the challenge and opportunity to plan their own schedules yielded similar results. Almost daily, the students demonstrated their own forms of Self-Regulation, particularly using group work but also on individual assignments. A mixture of procrastination and organization was at place within all as work was "consistent, but not constant."

B2. Collaboration increases student engagement

While work was not always constant, there was a stronger sense of focus when engaging in collaborative efforts in the learning space. Several patterns emerged from the observation data. This was not even limited to group assignments; it was clear that anytime students had an extended individual project, such as a draft for a paper, they would inevitably pair up and ask each other questions throughout the time in the lab, even without being directed to do so. On several occasions, a class of twenty-some students would form into ten pairs organically within minutes of the class starting. One example

occurred during the library sessions. S6 turned to her neighbor (a non-interviewed student) and said "so if I'm going to make the argument that society has a certain beauty standard, I can't just say that I don't care what I look like right now, I need to find a quote from resources and then find a quote for my own book right?" While peer tutoring is not unique to a Gamified classroom, the student-centered nature of the course allowed this to happen more organically.

Another example: when tasked with reading *The Importance of Being Earnest* aloud in small groups, all students, with the exception of those who had previously completed the play, were visibly engaged and on-task for the entire class period. Even S5, who frequently completed his English assignments outside the classroom, was actively engaged in the process. In other cases, there was the way students ahead in the "game" would assist those behind. On many occasions, S1, S2, and S4 served as guides for those completing tasks behind them. Rarely was the instructor required to or even asked to solve problems. He was instead used primarily for advice. S7 supported these observations during his interview saying "I think I am more confident, just because I know I have a good group of people that I am with. If I have any questions, I go to them, and they come to me." This comment neatly combines various motivational elements in the course. While not all students found value in every element, the Gamified course design, the use of mastery grading, and the availability of collaboration led to higher levels of Self-Efficacy across the board.

Of course, the most obvious example of collaboration was found in the Synthesis projects. Throughout the year, students were given multiple group challenges in which they had to solve a group, create a product, or design a presentation to demonstrate

completion of a QUESTT. "Projects" as such can be found in all classrooms, though in a Gamified classroom students are given the task of not only completing a task, but designing a solution as well. As stated before, the students were told to "make a satire on an existing field of interest." The students had to design their task, and then complete it, not just follow standard instructions. During the observations, students worked on a Satire project in which they were frequently standing, talking, filming, or even leaving the classroom to complete the work. Their efforts were focused yet active. Some groups would oscillate between casual conversation and production conversation such as S6/S8's group and S13's group, while others would work constantly, and then finish early for the day. Students described these projects as being fun, and giving them a chance to produce during their interviews, and it showed during the class time. One word, visible in student behaviors, and repeated in student interviews, was "fun". When asked about his favorite assignment for the year, S7 responded:

> I think the most beneficial had to be the satire. I think it was a cool way to learn it by making a video or making a PowerPoint, or website or something like that. […] Just because we excited ourselves. It was hands-on. In the beginning you were working with other people so it was fun, but the way we went about learning it, we put it together and made it interesting. It made the learning a lot better.

"Exciting", "fun", "hands-on", and "interesting" were all terms, which were repeated throughout the interviews. Not only was this spoken, but also it was clear as students demonstrated remarkably more engaged behaviors during synthesis group activities. They would quickly brainstorm ideas as projects began, rather than relying solely on the instructions. S10 concurred by noting:

> But with the satire videos, it was a lot better, we had a better group and it was more fun. It was interesting I learned from it. I didn't really know what a satire was before the project. I just heard the word a lot but I didn't really get it now I do.

Once again, the notion of fun is repeated element in the synthesis process, which nicely relates to the "play" element found in games.

When asked about the positive elements of the class, student responses indicated that freedom, class discussions, and synthesis projects were the most valued/cherished parts of the course. The collaborative elements of the Gamified course led to an observable shift in engagement.

B3. Students independently engaged without direct instruction

Another clear trend in the Gamified course was that students were able to engage consistently without the need for sustained direct instructions. By solving problems alone or with peers, they demonstrated high levels of autonomy as opposed to a traditional class, especially with students who demonstrated difficulty with school in the past. From a typical student perspective, most class sessions consisted of listening to the opening instructions, and then spending the period working on a task. Tasks ranged from watching instructor-created videos on the course website and taking notes, completing research tasks in the library, working in groups on presentations or projects using digital tools, or leaving the classroom to film. When asked to work independently to view and annotate instructor-created videos, nearly all students were consistently engaged for the whole period. A Gamified classroom is constructed to be asynchronous students are able to proceed "step-by-step" on their own, though they still have the option to question the

instructor when necessary. This differs from both a traditional teacher-centered course and a strictly online course.

To clarify, as a part of the "Understanding" portion of each unit (the first lesson), students were required to either watch an instructor-made video and take notes, or read the textbook and complete a note-sheet. In almost all cases, students opted for the video, and took notes either on Google Drive or on paper. Students preferred the videos, not necessarily for their quality, but for the design of the content delivery. Despite being distracted during other activities, students would give their full attention to the laptops while watching. While the videos were intended to be watched prior to the start of the unit proper, students had the ability to revisit the content whenever necessary. Many students, including S3, S5, S8, S9, and S14 were often observed re-watching lectures later in the course. In one instance, S8 referred to an optional video, which provided extra help in video editing for students who have not yet used this skill. She was then able to better assist her group for the Satire project. By embedding instructor-created content in the course design, the class has options to improve Self-Efficacy for all.

Beyond videos, the students were rarely seen asking the instructor for help; despite the fact the instructor circled the room throughout the course and made himself available. Typically the instructor would check in with each table once or twice a class period, but generally was only called upon for clarification, or to answer specific questions. S1, and S2 would often ask questions regarding working ahead, S4 would be seen discussing enrichment English material, and S6 and S8 would ask group-related questions. Additionally, S12 would often speak with the instructor would college plans and extracurricular concerns, but beyond these instances, most students proceeded

without direct instruction. The instructor generally maintained a pleasant demeanor and rapport with the students; their rejection of direct instruction was mainly because it was no longer required to solve problems when videos, classmates, and the 3D GameLab software could.

As mentioned in the previous themes, students were able to collaborate and answer each other's questions, learn content from videos, and utilized the software as a guide. Though not obvious from observations alone, students later cited the course design, along with the videos, as one of the key reasons for their rejection of direct instruction in the class. S8 talked about how "I like how it was all laid out and everything. Like when the instructor made an entire video on how to edit film. And then like how everything was designed and set up". The use of digital tools provided a design appropriate for students to follow independently. S9 stated, "I feel like I have the tools to succeed." and S11, a boisterous but often distracted student agreed concurred by noting "This, it breaks it down. It's like okay here is one quest. Here is one step you can do. And I know, because with that it is like breaking it down." Many felt the best part of the videos and digital tools was that they really gave the students the feeling of personalized learning. S9 felt, **"**It's because it is me. When the teacher is up in front of the room, he's talking to everybody. But when it's on the computer, he's talking to me. Period." S11 felt the use of real world examples in the videos, as opposed to a textbook, was more personalized to the student experience. S2 felt the videos reached the students better because they could be watched in a more flexible manner to meet attention spans, and S11 further espoused, "I think in a lot of the understanding videos, I re-watched it, like if

I missed something you can't re-watch a presentation that was given in class". The Personalization of the video watching experience was the first key points.

In short, student perception of videos in the course was generally positive due to their personalization, and the "just-in-time" information. The digital tools and course design led to a learning environment with little need for a "sage on stage" but rather "guide on the side", or perhaps a "meddler in the middle". All of these elements were viewed as reasons for the students' independence in the study.

B4. Human conflicts and preferences can hinder learning

Some final issues, which arose from the course, were conflicts between the groups. While it was clear students generally worked better in groups than alone, there were a few students who seemed to shy away from the group work. S1, S2, and S4, for example, were often ahead of the game and unable to join in-group activities. Though they did serve as peer tutors throughout, they were frequently working solo as they finished the course well before the end of the year. S6 and S8, though group members, were occasionally off track while working together, and S12 became visibly annoyed a distant with members of her group during the project. These human conflicts, however, are not unique to a Gamified course. The student interview comments validated these observations. S11 felt the class was split as a result of the different threads running "sometimes it feels like we are divided as a class. It's like we are not really a class. We can't have a lot of discussions. Like when we have Socratic seminars, I like to get everybody involved". Additionally, both S12, and S13 cited group problems during multiple projects, and S10 said she had a bad experience in an earlier assignment but was able to correct it later. While collaboration was seen by many as a valued component to

the course, it is also seen as a recurring negative theme. At times, the lack of class unity, and direct instruction led to new forms of human conflict.

Summary of External Perspective Themes

In summary, students perceived the Gamified class as generally improving their organization through demonstration of consistency, use of collaboration, and independence from direct instruction. Some found themselves procrastinating more than before, though this was offset by increased collaboration. For some, the digital tools allowed students universal access to their own work and course content and revisit concepts if needed at a later date. The instructor was available "on demand" in video form and more available if needed in class without feeling the pressure of a full room. This design appealed strongly to the introverts who wanted to succeed but do not always want to ask for help. Students found direct instruction through videos a far more engaging method of teaching as the videos provide more flexibility, a more personal connection, and can be accessed "just-in-time".

Additionally, while the introverted students preferred the independence, the use of collaboration also helped make some students feel more confidence. The ability to check answers with friends or create large projects in groups provided strength in numbers. The result was a learning environment with a consistent, if not always constant workflow. Though human conflicts persist, the consistency, collaboration, and independence far outweighed these hang-ups.

Common Findings

While individual student perspectives and the researcher's external perspective yielded varying themes and patterns, there were some common elements to each

viewpoint. These common threads, along with literature from Chapter II, will ultimately serve the basis for the conclusions in Chapter V. Despite the varying views, the data ultimately showed similar findings in the student relationship with the course and course, the students' awareness and execution of improved learning habits, and the advantages (as well as disadvantages) of group work.

C1: Increased Student Connection with the Course and Content

When interviewed, students cited strong connections with being able to "see" their progress, specifically when it came to grades via the Gamelab's XP system. Several students (including S8, S9, and S13) discussed how they were able to calculate the necessary steps in order to reach their course goal and then take steps to finish it. S8, for example, stated she had significantly higher grades in this course than in years past because she had a more tangible connection with the assignments and her progress. This could possibly reflect a shift in a student's Self-Determination towards completing the coursework. This notion of connection and engagement was mirrored in the external observational perspective as students are rarely seen learning passively from the instructor. In fact, while the instructor is available though out the courses, he spends very little time addressing the group as a whole, and has considerable amount of down-time as students are able to engage with the system and solve problems on their own. The increase in student connection with course (and assumedly the content) is matched with an increased visual sense of individuality and autonomy.

Other students noted that it was not necessarily the game-elements (the visualization of XP, the badges, etc) that increased their connection with the course, but rather the freedom and autonomy to select assignments on their own. Students stated

(such as S12 in theme A2) that the responsibility was "on him" to complete tasks. S5 cited the ability to "do his own thing" rather than follow a strict schedule. As a result, these students not only stated they had lower levels of stress (S6, S11) but also they felt an increase in responsibility. This was again echoed in the observations as students, while occasionally off-task, were seen asking each other questions, keeping on pace with minor corrections, and completing assignments with little instructor interaction. In both the observation, and the interviews, there was a common thread of increased student connection with not only the content, but the course design as well. Analyzing student responses, as well as the observations, the ability to manage one's own learning, progress, improvement, and schedule makes learning a much more enjoyable process as its nearly voluntary, far more customized, and therefore more authentic. While only some students showed higher forms of Self-Determination, all students cited and demonstrated a strong level of Self-Efficacy. Students stated they felt stronger feelings of ownership (A1), better able to conceptualize their progress (A2), and this led to an ability to conduct the course with minimal direct instruction (B3).

C2: Student Working Habits including Increased Independence, Distraction, and Collaboration

While there was a strong connection between the students' ownership of the content and their final progress (total XP) as opposed to traditional courses, their daily working habits did not always match their perceived shift in focus. While students may have felt emboldened by their increased autonomy offered in the Gamified course, or that the course improved their responsibility, the changes in their organizational and time management skills was often simply magnifying their existing skills. For example, when

asked what element of the course they found most beneficial, all interviewed students responded that it was the "freedom" that they valued most. Even so, the students did not value this freedom just because they could do whatever they chose, but because they had the responsibility to succeed. While freedom and responsibility were some of the most valued elements in the interviews (theme A3) this was not always reflected in the daily work. As stated earlier, it was clear that, detached from the direct instruction, some students struggled to stay organized. Some students, specifically S5, S8, S13, and S14, would seriously procrastinate to begin assignments or activities. As students are able to choose their own schedules, it was not uncommon for time to be wasted before it is used wisely. Indeed, work was consistent, and but not constant (theme B1). Feeling increased responsibility, and having increased autonomy changes students' long term goal setting and ownership, but not always daily work habits.

Despite the fact some students were behind, demonstrated lower levels of academic ability, and procrastinated, nearly all students were ultimately able to complete an average number of assignments throughout the quarter. The "safety net" allowed the struggling students the chance to bounce back. This improved confidence led to a noticeable lack of stress among the students.

The one exception was the use of group work, specifically on group projects, or paired assignments. While there were many variations, typically students would either be working individually, or on a group project. During all group sessions, students would state things like "this quote seems funny but it's really not been a be that interesting (S7)" or "I think the themes of these actually end up being the same (S11)." These conversations, much more frequent during project-based assignments, demonstrated an

ability to answer questions separate from the instructor. Here, students were able to "check" themselves. Students stated in the interviews they liked being able to ask each other questions, as well as the instructor. This was evidenced by the frequently examples of unplanned group collaboration in the observation portion. As mentioned, on several occasions, a class of twenty-seven students would form into ten pairs organically within minutes of the class starting.

In brief, student working-habits changed, though not in the same manner as their perception. Some students were more independent and organized, others procrastinated more on a daily basis, and all found some value in the collaboration. In comparing these findings with the research questions, it could be said, then, that the Self-Determination and Self-Regulation was not as uniformly affected as the Self-Efficacy, a topic that will be explored in more detail in Chapter 5. Students stated that they felt increased responsibility (A3), which was sometimes seen in group collaboration (B2), but not a constant change as some students worked inconsistently on a daily basis (B1).

C3: Human Connections Can Cause Conflict

The third, and perhaps more peripheral common thread between internal and external perspectives were the perceived negatives from having to work in group systems. While collaboration had many benefits, it occasionally led to instances of distraction, or unfair division of labor. In some cases, such as S6 and S8, students would simultaneously help and distract each other. Other students like S1 and S2 stated they preferred to work alone, a fact mirrored by their consistent work on individual projects. Another pair, S11 and S12 found that working in groups could lead to personality

conflicts at times. While none of these situations are unique to Gamification, they do tie into the overall "perceptions" research question.

Another "human connection" conflict stated in the interviews was the perceived lack of equity in grades. While no student felt he or she was not given proper credit, many felt others should have received less credit, or fewer chances. Similar to the group conflicts, there were instances where collaboration lead to conflict, and where independence could lead to a resentment of others. Even so, all of these observations and responses were a small minority and not indicative of the common experience.

Conclusion

This chapter sought to provide a detailed summary of the major data sets and organize data so that it may be used to answer the research questions in Chapter IV. The LMS data, and observation data, and interview data were used primarily to gain a greater understanding of student personality, and course dynamics. LMS data revealed little by itself, though provided deeper insight into the results of the student working habits. The vast majority of students completed high numbers of quests in the fourth quarter despite not always being on visibly task. The observation data revealed that students were working consistently, if not always constantly. The classroom environment was open-ended with a great amount of free time. Students showed higher levels of focus on videos and group projects. These observations were backed up in the interview data when students cited the synthesis project, and classroom videos, as well as the overall freedom of the course as some of the most important advantages over a traditional English class.

Generally, students indicated improved levels of Self-Determination, Self-Efficacy, and Self-Regulation to various patterns depending on the student type. Students

felt the game elements were motivational, allowed for greater visualization of their progress, and the structure provided a stronger sense of ownership, though not in all cases. Self-Regulation was increased primarily due digital elements, lack of daily scheduling, and the need of personal responsibility, though procrastination was still present in some cases. Self-Efficacy was arguably the strongest improvement as students felt the use of Mastery Grading and collaboration gave them far more confidence to succeed, while reducing stress. Perception was generally positive as a result of the sense of personalization, freedom, autonomy, and responsibility given to the students in scheduling, direct instruction, and large group projects. Chapter V will seek to draw overarching conclusions based on a synthesis of the existing literature and the findings presented in this chapter.

Chapter V: Discussion

Introduction

This chapter summarizes the purpose of the study and interprets patterns identified in the data. After collecting data from three different data sources including student interviews, observations of classroom behavior, and quest completion numbers, patterns in learning habits, perceptions, and classroom conditions began to emerge. Chapter IV synthesized the data into clear themes, and this chapter uses this information, combined with research from the literature review, to answer the main problem statement and the corresponding research questions. The chapter concludes with general conclusions on Gamification's effect on learning habits, and implications for future research. Limitations of this study are also delineated.

Statement of the Problem

This study sought to examine how the use of Gamification, or Gamified elements in a high school English classroom affects learning habits. A Gamified course is a combination of a digitized curriculum in the English classroom, the incorporation for project-based learning, and a shift to a Gamified, mastery-grading structure will be qualitatively described based on student perception. Gamification has been seen as a new method of instructional design through their use of motivational techniques. Though there is a rise in use of Gamification in education, there is little research to support its use thus far (Van Eck, 2011). This study sought to add to that conversation. The main goal is to explore what changes, if any, the Gamified model had on student learning and working habits. The guiding problem statement was "What effect does the use of a Gamified curriculum in a high school English classroom have on student motivation and learning

habits?"

Research Questions

1. What effect does a Game-Based curriculum have on motivational learning habits? These include:
    a. Self- Determination
    b. Self- Regulation
    c. Self-Efficacy
2. What are the students' perceptions of Gamified learning?

Review of Methodology

The study followed a qualitative case study design. While quantitative research closely aligns with a more scientific method, qualitative research involves the use of observation, interview, descriptive, and verbal data in order to yield results (Cresswell, 2007). By using a purposeful sample from a convenient population, the study consisted of observation data of student behaviors using the Gamified-learning model. To triangulate these observations, interviews asked students individually, about their dispositions towards the Gamified learning system and on their own learning habits. Triangulation has risen to be "an important methodological issue in naturalistic and qualitative approaches to evaluation [in order to] control bias and establishing valid propositions because traditional scientific techniques are incompatible with this alternate epistemology" (Mathison, 1988, p. 13). The three measures of data collection, detailed in the following section, were:

1. Learning Management System Usage Data

2. Student observation data
3. Student interview responses

A diverse sample of students was required to defend again bias based on a gender, and to gain insight into the different methods of completing the class.

Limitations of the Study

While focused, the study was limited in several aspects. The sample was chosen from the principal researcher's own students, some under the age of 18, which limited the amount of data that could be collected. Observations were made via video rather than live due to logistical reasons. Additionally, the classroom observed did not employ a strong narrative structure to the Gamified-learning model, which may or may not have affected the learning habits. This will be discussed in the final conclusion. Findings of a qualitative study are not generalizable by the researcher. The generalizability is left to the reader to extrapolate their findings to their own environment as many variable including content, class size, method of instruction, and other elements may skew results (Merriman 2001). While all findings have been deemed credible, and the study adds value to the overall conversation, there is not a direct generalizable answer.

Review of the Findings

This project derived a theoretical framework around Albert Bandura's work, which establishes clear connections between motivation (Self-Determination), Self-Efficacy, and Self-Regulation as well as the importance of these elements in academic success (Bandura, 1992). By examining Gamification through a lens of motivational behaviors, there could be some indication on what impact this method might have on student learning. In Chapter IV, the three forms of data were synthesized for patterns and

themes, which addressed the initial research questions. The following chart (Table 8) reviews the major themes, which were presented and explained in the previous chapter.

Table 8
Chapter IV Themes

Data Collection Method	**Themes**			
Interview Data	**Theme A1**: Game Elements lead to stronger conceptualization of progress	**Theme A2:** Customization has a strong effect on ownership	**Theme A3**: Daily autonomy leads to lower stress and increased sense of responsibility	**Theme A4:** Lack of perceived equity among some students
Observation Data	**Theme B1**: Work is consistent but not constant	**Theme B2:** Collaboration increases student engagement	**Theme B3:** Students independently engaged without direct instruction	**Theme B4:** Human conflicts and preferences can hinder learning

In the following sections, the themes will be merged further to present conclusions as they pertain to the four major sub-sections (Self-Determination, Self-Regulation, Self Efficacy, Positive and Negative Perceptions). Additionally, research from Chapter II is reintroduced to draw connections between games and Gamification in both theory and practice. Overall, Gamification led to strong increases in Self-Efficacy, mixed results on Self-Determination and Self-Regulation, and generally positive perceptions of the course, specifically on personalized direct-instruction videos and large group collaborative assessments.

Discussion of Research Question 1a: Self-Determination

Self-Determination was defined earlier as goal-directed mindset, which compels a student to accomplish tasks (Bandura, 2003). This element of motivation can be internal or external, as well as positive or negative in nature. This study focused both on intrinsic

and extrinsic levels of motivation as the latter often facilitates the former (Foregaurd, 2013). Students were asked specifically about how motivated they felt in a Gamified course as opposed to a traditional English course. Additionally, quest completion data was used in combination with observation to see if the students exhibited "self-determined" actions or results. It is worth noting that while there was initial concern that gender may influence the effect of Gamification on students, all responses were found to be cross-gender in nature (Bittick, 2011). From the themes outlined in Chapter IV, several conclusions were reached.

A1. Game Elements Affected the Highs and Lows More Strongly

In examining Self-Determination, both higher and lower performing students cited higher levels of motivation, while students with average performance cited little change. The higher performing students felt inspired to acquire more XP, badges, and awards to "win" the game, while the lower performing students were empowered by being able to visualize their progress unlike in past courses. As stated in Chapter II, game elements offer an initial situational interest through elements of achievement, immersion, and escapism (Haskell, 2012). This includes their ability to "challenge players, activities such as games are fun because they fulfill a desire to compete, intrinsically motivating for their own sake, create a state of flow in which people lose sense of time, effort levels are maximized when players have equal skill (De, 2013)." Chapter IV revealed that several students found themselves more motivated than a traditional course as a result of these elements, including experience points (XP), badges, levels, and rewards, which compelled them to work faster and better. Game-elements, however, only seemed to have an effect on those students who already felt they were motivated prior to taking this

course.

While game elements including "leaderboards, badges, level systems, achievements […] and rewards" (Erenli, 2013, p. 17), were specifically praised by students previously possessing high levels of Self-Determination, lower-motivated students cited that their Self-Determination increased in the Gamified class because they could visualize their progress. Many claimed that being able to understand exactly what tasks needed to be completed to reach a concrete goal made them more motivated especially as the deadlines were near. This was evident not only through interview responses but also through observation data as students would often waste class time early, yet still complete the work by the end of the period, week or quarter, a trend reflected in the quest completion results. Visualization of learning aligns closely with Enactivism as learners react more concretely "with objects and events" (Li, 2012 p. 788). Enactivism states that the combination of mind and body leads to enhanced knowledge as its removes passivity (Li, 2012). The use of visuals and concrete elements to indicate progress fit neatly in this model. Visualization, especially for students who self-identified as "procrastinators", was clear cause of improved Self-Determination.

A2. Increased Choice led to Increased Ownership with All Students

Ownership was a clear finding among all types of students as they described how the Gamified structure of the class allowed them agency of what they learned, which tasks they completed, and when they completed them. The element of choice allowed students follow take control of their environment. Casim (2013) states that the "techniques of ownership in […] learning include: Finding personal value, feeling in control, and taking responsibility. Allowing learners to set their own learning goals can lead to higher

commitment" (p. 12). Because the learners had choice in which assignments to complete and how to complete them, there was an immediate increase in ownership. Traditional structures of "learn this, then do this" were dismissed and even mocked by students in the interviews who found standard points/grades counterintuitive to learning. As Weinmer (2002) stated, such behaviorist methods are only effective in a short-term basis, but ultimately students must "own" the task including the method of completion and purpose if it is to be truly meaningful. While not every student felt there was a difference in Self-Determination (one noted that "it's the same assignments as always"), the majority found their Self-Determination to be increased, as was their ownership of the content and process. Though several students who had previously taken Advanced English felt the content rigor was low, these students cited increased Self-Efficacy and Self-Regulation gave them a stronger sense of sense of ownership and grit (Van Nuland, 2012).

In summary, Self-Determination was affected in the majority of students, albeit in different ways depending on their previous levels of academic motivation. Students with especially high and especially low motivational learning habits were impacted directly by Game-elements, but the ownership led to higher instances of Self-Determination throughout the class.

A3. The Lack of Narrative Failed to Engage All Students with Situational Interest

One absent game element was the use of narrative, a game-element which has prompted much discussion in the literature. As stated in Chapter II, narrative "is ubiquitous in human reasoning and allows humans to assign meaning to their experiences" (Dickey, 2006, p. 252) and "is more immersive at times, games and

narrative could detract and distract" (Adams, 2012 p. 238). While the students were all "playing a game", no narrative aspect arose in the findings. In fact, game-elements were only mentioned by half the students during class, and barely discussed by the instructor aside from "quests" and "experience points". By the time this study was conducted, the game-elements were rarely addressed by the instructor during live sessions. Nevertheless, prior research shows that narrative is important to games as it led to "flow state theory", the idea that playing a game (or completing a number of activities) creates a sense of "flow" which captures the user (Csikszentmihalyi, 1980). The use of narrative has been shown to make the player, or student, lose themselves in the storyline and gain enhanced self-determination (Salmani, 2009; Dickey, 2006). It may have been this lack of narrative that failed to unify the other game-elements and create a situational interesting experience.

Students with average quest-counts and moderate motivational learning habits (those neither overly ambitious nor those are perceived themselves as slackers) were not significantly motivated by the game-elements. These students who saw themselves as average, or below average did not directly reference the elements. Plass (2013) states that motivation is a symbiotic relationship between individual and situational interest. Those students previously possessing individual interested were self-determined easily, but those who have not yet reached this stage require high levels of situational interest. The game-elements, in this case, may not have been engaging enough to achieve this effect.

Without the narrative structure, many students, especially those that neither struggle nor succeed at school were unable to achieve the sense of "flow" and become immersed in the game (Csikszentmihalyi, 1980). The lower-performing students thrived

as the game-elements offered some small elements of situational interest, and the higher performing students succeeded as these elements augmented their individual interest, but there was little movement in the middle (Plass, 2013). While this improved in other areas, Self-Determination remained unchanged, as they did not properly "buy-in" to the extrinsic game elements. This is not to discount the positive affects the game-elements had on the other students, but merely to suggest they are not inherently valuable without narrative or pre-existing mindsets

Summary of Research Question 1a: Self-Determination

In short, Self-Determination improved as a result of the Gamified classroom as all students gained an increased sense of ownership through the increased choice presented in the class. Even so, the game elements themselves affected students with exceptionally high and low motivational learning habits more strongly as the higher-motivated students felt more motivated to achieve more while lower-motivated students better understood their progress through the visualization of the XP. The lack of narrative structure failed to entice all students to move beyond a situational interest to a more individual interest.

Research Question 1b: Self-Regulation

If Self-Determination is the desire to get things done, and Self-Efficacy is the confidence in one's ability to complete the tasks, Self-Regulation is the action of planning and carrying out these goals. Self-Regulation is a strategic behavior by students to systematically and deliberately accomplish a task including rehearsal, elaboration, organization, and critical thinking (Sadi, 2013). Bandura (1992) states the importance of this trait in motivational learning habits because the demonstration of self-regulated learning strategies acts as a bridge between Motivation/Self-Efficacy and achieving

academic goals.

B1. Previous Self-Regulatory Patterns were Magnified, but not Altered

In terms of Self-Regulation, Gamification magnified existing behaviors (Bavelier, 2011). Previously self-regulated students demonstrated even greater planning skills, while self-proclaimed procrastinators immediately procrastinated more. Highly self-regulated students felt they had a stronger sense of Self-Regulation because the course made them create their own short-term goals. According to the social cognitive perspective, self-regulatory processes fall into three cyclical phases: 1) forethought, 2) performance or volitional control, and 3) self-reflection (English, 2013). Students who were given a large task and asked to come up with a plan found they were being more organized by choice because they were finally given the option to plan. Rather than having each step pre-arranged, students finally had agency to regulate themselves. In these cases, the game's natural structure magnified the existing tendencies of self-regulation.

Additionally, students who described themselves as "procrastinators" had their procrastination increased. A key phrase which appeared again and again in the observation notes was the "work was consistent but not constant". Students were always "almost on-task" and slowly but surely moved towards a goal on their own, yet there were many instances of wasted time. Observation data showed several students off task for large chunks of the period who would finally complete the work toward the end of the period, or in some cases only in latter days of the study. These students mentioned they were ultimately more organized because "they could procrastinate but then they eventually had to do it".

Looking at quest completion data, there is a case to be made that even procrastinators ultimately increased their organization as nearly all students completed similar numbers of quests during the fourth quarter. During the course of the study, all students completed 24 quests (+/-5) with only two exceptions. Even those numbers are misleading as one student (S12) had reached her "A" goal early, and another (S13) was frequently absent. Despite initial magnification of procrastination, the Gamified classroom lead to a balanced level of work among nearly all students. To complete the work on time requires some level of organization. A traditional class would have immediately ordered students back on task, but by running an asynchronous game, all the work was still completed.

Even so, there is a difference between Self-Regulation and simple organization. Self-Regulation is a pattern of behaviors intentionally taken to complete a task systematically while also leaving time for reflection (English, 2013; Sadi, 2013; Wang, 2013). Completion of work on time is a portion of that, but alone does not constitute a pattern of goal setting, monitoring, and reflecting. It is therefore clear that while Gamification may increase the number of quests completed, it does not improve the Self-Regulation of students who described themselves as procrastinators. In fact, as time progressed though the course, it was the higher-regulated students who would work ahead, inevitably take a break and help others, allowing students who feel behind to catch up despite appearing off task. The findings reveal it was this sense of collaboration that helped to improve final results, but not to improve the rampart procrastination among some of the students. It can therefore be stated that this incarnation of a Gamified classroom did little to alter self-regulatory habits, but rather magnified existing traits.

B2. Students Understood the Future Value, if not Practice, of Self-Regulation Skills

While not all students showed strong Self Regulation skills, many felt the Gamified system offered them more realistic skills for future academic careers. By acknowledging that completing work for a due date is not the same as planning and making their own small steps, students recognized the path to improve their self-regulation skills. "In order to be successful in [problem-solving] students must take responsibility for the learning process by setting goals, monitoring, reflecting, and sustaining their motivation from the beginning of the project until the end" (English, 2013. p. 127). Several students stated it was better preparing them for college. The concept of having the freedom to choose their own goals was appealing to these students. Songhao (2011) found this to one of the five key elements to the future of education including: free and self-directed learning, access to material, learning outcome and achievement assessment, class participation and occasional collaboration, and collective intelligence of the learning.

Additionally, students saw the value in digital tools to enhance their organization and planning in future endeavors, a concept found in several studies (Romizowski, 2004; Kay, 2008). Students of both genders and all motivation and ability levels felt they were more organized due to the Google Drive and 3D GameLab systems. Even students who did not enjoy using computers realized they were more organized using them. While technology is not required for a Gamified class, the course did increase technology acceptance which "has been described as the, 'approval, favorable reception and ongoing use of newly introduced devices and systems'" (Laver, 2012, p. 221). In fact, this

increased acceptance of technology, and by extension, organization, is more likely a result of increased Self-Efficacy with the new tools (Laver, 2012). In summary, while several students simply continued to procrastinate, there was a consensus that the Gamified course exposed the need for more Self-Regulation both at present and in college. Additionally, from a logistical standpoint, all students felt more organized as a result of technology access.

Summary of Research Question 1b: Self-Regulation

In short, Self-Regulation was magnified in a Gamified learning systems, though not necessarily changed. Those with high levels of organization found themselves inspired to be *more* organized, while those who procrastinated increased their procrastination. Over time, all students were able to complete an appropriate amount of work due to help from peers, and general social pressure, though this does not automatically make the "self-regulated" (Bellotti, 2009).

While the practice of self-regulatory skills was not always at peak performance, the awareness of the need for Self-Regulation was raised. As students were placed in an environment that required them to step up, they began to realize the importance of doing so. In fact, this describes the very definition of "play", a situation in which one steps up to become more than they believe possible (Kark, 2011). While a Gamified classroom does not also yield planning skills, the increased Self-Efficacy and social sense of play, couple with an increase of available tutors lead to increases in quest completion. Some learned from experiences the perils of their magnified procrastination, while others gained help from peers and digital tools.

Research Question 1c: Self-Efficacy

Self-Efficacy can be defined as a student's perception of his/her own abilities and disposition towards a task, tool, or content. These perceptions consequently affect the student's performance either positively or negatively (Bandura, 1997). Operationalized as "confidence" in student interviews, this trait was seen by all students as improved as a result of the Gamified course.

C1. Mastery Grading and Collaboration are the most potent Game-Based tools

Of the three traits examined in Research Question 1, Self-Efficacy was the most universally improved, in part because this trait is the one most closely linked with gameplay (Kark, 2011; Manusos, 2013; Rooney, 2012). This was due to the multiple methods used to improve this skill. The first was collaboration, especially with group projects and peer tutoring. A key element to many modern games is collaboration. While collaboration is not unique to Gamification, it has been an essential element of games and "play" for years (Charsky, 2010). Game playing is social as players the mechanics, practices, negotiation and context of the game players. (Li, 2012; Van Eck, 2011). Social interaction, context, and multiple users can add more satisfaction, stronger relationships and understanding. (Plass, 2013; Bellotti, 2009). Several students stated their success this year was because they "had a strong group of people to work with" and "were able to choose people that worked well" with them. Both observation data and interview data revealed that group work was the most engaged type of assignment that a student could complete. Indeed, a common trend from classroom observations was students asking each other questions rather than the instructor and solving their own concerns. Collaboration,

when utilized yielded higher levels of Self-Efficacy.

In addition the Collaboration, Mastery Grading led to strongly levels of self-efficacy. Again, while Mastery Grading is not exclusive to Gamification, learning through failure and receiving consistent formative feedback is a trait of any good game (Gee, 2011; Charsky, 2010). Half the students directly reported feeling more confident or assured they could complete tasks due the mastery grading system. Based in Bloom's (1984) work of measuring assignments for mastery and assigning feedback rather than formative assessments, students found themselves taking risks and trying new forms of lessons they would previously have avoided. Higher-level students were more creative by trying previously feared topics like poetry, while lower performing students would "give it their best" and see what happens. Many students in the middle saw value in learning from their mistakes rather than just "reflecting on them", a key element of games mentioned by Gee (2011) as part of his "reflective process" of games. Failure allows learners to try new strategies and understand how they learn (Charsky, 2010; Plass 2011). A few students mentioned they "always tried their best regardless", but confidence was clearly raised in their ability to succeed as a result of the mastery grading system.

C2. Gamified Course design is Most Compatible with Improving Self-Efficacy

Bandura (1997) stated that people with low Self-Efficacy often avoid work if they do not understand it, yet many students who mentioned they had struggled in past courses were able to meet their goals this year as a result of the class set up. For many, the use of digital tools, steps, clues, and cues were able to guide them to success. Games are set up in the same way. Felicia (2012) stated "Evidence has also shown that the use of

"multimodal interaction and multi-sensory cues may successfully engage learners, enable them to adapt the interaction to their own style, and help them to understand phenomena by providing new perspectives" (p. 7). Dealing with this course, "tools" was a term that many students used to describe their progression through the course. Students felt that while there was a lot of work, with some challenging projects, they "had all the tools they needed" to figure it out and "everything was step by step". The modulation allowed students to solve "one piece at a time" to get things done. While Self-Determination was limited to increases in student with exceptionally high and low motivational learning habits, and Self-Regulation was sometimes worse before it got better, Self-Efficacy was clearly improved amongst all students. The use of project-based assessments, mastery grading, modularized lessons, multiple choices in assignments, freedom to fail, asynchronous delivery, and optional assignments provided an environment that presented itself differently but effectively to all students. Some used the flexibility to work collaboratively, others worked alone. Some completed all work in class on time, while others did everything at home and used the class as a student hall. The instructor was rarely found lecturing or at the center of the class or even the center of the group, but was relegated to "another resource" in the tool kit of students. The "game" was less of a video game in terms of game-elements, or more of a "self-driven adventure" based on game philosophies. In fact, it was the "design", that seemed to drive all success of the game. The videos, large projects, freedom, digital tools, and flexible schedule/grading all trace back to the overall design. Students were able to figure it out on their own, which is arguably the definition of Self-Efficacy (Bandura, 1997; Zimmerman, 2000).

It is the "course design" that was the strongest advantage to Gamification's effect

on Self-Efficacy, demonstrating itself not only by the responses, but also by quest results (several students were able to work weeks ahead on their own), and observations (students who mentioned struggling in the past were visibly able to work independently…once properly motivated). While Self-Determination yielded positive responses and mixed actions, it was nearly unanimous that students had higher levels of Self-Efficacy in a Gamified course.

Summary of Research Question 1c: Self-Efficacy

Games and play, at their core are most conducive to increasing levels of self-efficacy (Hamlen, 2013). One primary game element is the freedom to fail, incarnated by Bloom (1984)'s Mastery Grading model. Another key ingredient to games is the use of collaboration, which is highly encouraged in the multiple large-group assessments. Though Self-Determination was more successful on the students with exceptionally high and low motivational learning habits, and Self-Regulation was merely magnified, Self-Efficacy is increased in all areas.

Discussion of Research Question 2

In addition to the affect on their learning habits, students were asked about their positive and negative perceptions of the Gamified course. The course was overwhelming perceived as positive compared to a traditional English course due mainly to the freedom, and the use of videos in place of direct instruction and large group projects

D1. Personalized Instruction/Assessment are Preferred Over Traditional Methods

Looking at the perceptions, one common thread was that students enjoy the work

best, and complete better products when they feel they have made the choices. Schneckenberg (2009) writes that "learning technologies have, in pedagogical perspective, the potential to foster to a paradigm shift from teaching to learning; this topic has a long tradition in educational research" (p. 412). Students overwhelmingly felt the video lectures by the instructor provided an increased sense of personalization, flexibility in content delivery, accessibility of relatable information. These videos served as an example of Kay's (2008) "learning objects" defined "as 'interactive Web-based tools that support learning by enhancing, amplifying, and guiding the cognitive processes of learners" (p. 447). Despite containing the same content as a traditional direct lecture, these videos were considered an improvement as students felt the instructor was speaking directly to them, not the class as a group. Additionally, the students had the ability to access the lecture beyond the classroom and "learn on the bus (S11)" if needed. Beyond simply watching videos, however, the number one preferred element of the course was the freedom to choose one's own path. This has already been shown to lead to increased Self-Regulation in some and improved Self-Efficacy in all, but also connect with Van Nuland's (2012) self-determination theory, which "operates under the assumption that people have a natural tendency to learn" (p. 468). All students valued this trait because it provided them the ability to work ahead (higher performing students), increased their sense of responsibility (middle performing students) and lowered their stress levels and allowed for a more balanced approach (all students). The flexible schedule and optional assignments gave students agency in which path to choose, and the synthesis projects gave students options in how they will be assessed. Again, the use of choice, flexibility, and agency are indelibly linked to play and games. When game methods are followed

most closely, improvement follows (Songhao, 2011).

When asked about favorite assignments, one frequent favorite were the Synthesis projects which required students to create a video, solve a problem, make a product, or act out a presentation. Students found these activities "fun", a term strongly tied to game-based activities and learning in general. As play can be a "serious" activity, the use of knowledge, transfer and motivation all gain an added practical importance. As described, play is perhaps the most effective learning technique (Haskell, 2012, p. 15). Gee (2011) followed suit by saying it is not that players enjoy solving problems; it is that the solving of the problems *is* play. By doing, one is able to learn both about the task and oneself. Additionally, students found value in the ability to "make", "produce", and "do" and even took pride in their work beyond the grades. This fits neatly with the goals of project-based learning which is to create "external artifacts, are public representations of a learner's solution to a guiding question. Inherently linked to constructivism, the production of a learning artifact is what consequentially "distinguishes project-based learning from problem-based learning" (Grant, 2011, p. 38).

This use of flexibility is essential to learning, and specifically project based learning. To effectively engage in project-based activities, students must:

> Become responsible for their learning and actively participate in the processes of constructing knowledge and making meaning For many students, this role conflicts with deeply ingrained habits they have developed through more familiar classroom experiences, in which they have been passive recipients of knowledge. (English, 2013. p. 128)

Going along with project-based learning, "creation" and "fun" were the final positive

themes of the course. In summary, students had overwhelming positive responses to the videos, flexibility, and projects in the course. Each of these neatly aligns with the elements of a Gamified class including blended learning, player choice/freedom to fail, and project-based learning, along with play, all respectively. In short, these methods of instruction and assessment were preferred because of their close connection to game elements (Kapp, 2011; Gee, 2011; Haskell, 2012).

D2. Human Conflicts Can Hinder Positive Perception

The Gamified classroom, while attempting to reshape the classroom, was not free of older paradigms. Despite the new methods and learning tools, some students still found issue with the class. Students were evenly mixed on discussions as some favored the online version, while others wanted more live discussions since face-to-face instruction often leads to unscripted learning, which can add to the overall effect of the education (Whithaus, 2006). Additionally, on large projects, many thrived under the group work. In fact, based on observation, the class was never more engaged than when working on a large group project. Even when working alone, students would naturally pair up. Even so, some students found group work to be problematic due to logistical reasons and personality conflicts. There has been noted to be a phenomenon in which groups as a whole are able to remember far less than individuals. One author notes that the reverse, "collaborative facilitation, where collaborative groups recall more than nominal groups, has rarely been demonstrated" (Congleton, 2012, p. 536). Even so, while this division was a "theme", the vast majority of students still valued the group projects, and was able to find solutions. This conflict and negative element is less of a flaw in Gamification, and is rather just a flaw in the general human condition.

Additionally, a healthy minority of the students felt that while mastery grading provided a solid safety net and encouraged them to try new things, it "unfairly" allowed lower performing students to achieve the same grades as those who worked ahead. This is interesting to two capacities: the first is that the students found unfair the very aspect of the course they also value (mastery grading) because it allowed others to seem equal to them. The second major indication is that while game-elements were motivating for these previously motivated students, they were ultimately still aware of the grade conversion back to the real world. Though students may claim to value information over grades, and seeks to acquire as many badges as possible, they still find it problematic other students get the same letter. Perhaps this is an indication that while extrinsic game elements are motivational, there are not as effective as existing cultural standards, and intrinsic structural changes. In other words, the existing "personal interest" the students have in high grades is unable to conquer the "situational interest" of the Gamified rewards. The game elements are inferior to "real" prizes (Plass, 2013).

Summary of Research Question 2: Perception

While students do not always agree with the choices of others, evidenced by their occasional perceptions of inequality, they treasure the ability to choose and manage their own learning the best. While these elements are achieved through a combination of the "inverted" model, and "project-based" learning, the game-based philosophy brings them together to create choice, as there are currently very few working models with all of these elements (Romizowski, 2004). Choice leads to stronger self-efficacy, which, in a scaffold-based game environment, can lead to greater Self-Determination and Self-Regulation.

Conclusions

From these discussions, it is clear that Gamification is most effective when it adheres to use fundamentals of "games", "play", and "social design" (Gee, 2011; Kark, 2011; Rooney, 2012; Malaby, 2009). Self-Determination is increased for students with exceptionally high and low motivational learning habits as it offers possibilities for success for highly motivated students and a visualized sense of ownership for low level students (Li, 2012). The lack of narrative fails to provide adequate situational interest for middle-motivated students (Dickey, 2006; Plass, 2013). However, the sense of agency and ownership found throughout the system offers mild improvements in all students' Self-Determination. They have a strong desire to be independent. Self-Regulation is initially magnified which increased both organization and procrastination, though the Gamified classroom culture still encourages awareness self-regulation in other areas of life (Plass, 2013; Chee; 2012). It is Self-Efficacy, however, that is most successfully improved, as it possesses the strongest connections to games and game design. Even though Self-Efficacy is not the equal to outcomes, such as however it "is an affective state that interacts with these measures, at times as a reinforcement" (Mayfield, 2012, p. 360). In fact, Self-Efficacy is arguably the most important element. While "Rehearsal, Elaboration, Organization, Critical Thinking, Metacognition, Self-regulation, Time management, and effort all lead to achievement, it is Self-Efficacy leads to all of these attributes" (Sadi, 2013, p. 27). Bandura (1999) saw a strong connection too between Self-Efficacy and positive social growth.

Additionally, student perceptions are highest for digital video lectures, large group synthesis projects, and overall choice and agency in course design and completion

In other words, it is the elements of the Gamified class which are most unique to "video games" that are most potent in improving motivational learning habits and increasing positive perception (Sams, 2012; Gee, 2011; Kapp, 2011). Improved Self-Efficacy, personalized experiences, freedom to fail, motivational game-elements, and visualization of abstract concepts act as the most potent elements.

Suggestions for Further Research

This study sought to examine how a Gamified English course might affect the motivational learning habits of students. There still remain many elements of the Gamified classroom which remain unexplored. One is the increased use of narrative. While narrative has been discussed at length in literature review for its importance in game design, there was little/no narrative present in this course, due mainly to time constraints of the instructor in creating of the course. Further study into the effect narrative has on further increasing motivational learning habits would be a valid pursuit. Additionally, a quantitative study to measure the effects of a Gamified classroom on a student's ability to learn content would be valuable. After all, learning habits and motivation are only valuable because they inherently lead to greater levels of learning (Bandura, 1992). While many students claimed to learn more than previous years, or be motivated than in years past, a direct comparison provides more insight. A final study, which may prove useful, is a study on Gamification without such an integrated use of technology. Many elements of the course, including the videos, Google Drive, and media projects were stated as aiding in Self-Determination, Self-Efficacy, and Self-Regulation as a result of technology. It would be valuable to isolate the game structure of the course from the use of technology in student work. In short, there are multiple studies needed to

complete the growing web of Gamification research. This study is but a thread in a much larger tapestry.

Researcher Reflections and Study Summary

Arguably, the primary goal in education is to help students learn. Bandura (1992) presents the framework that motivation, constructed through Self-Determination, Self-Efficacy, and Self-Regulation, leads to greater student learning. This study, then, set out to explore the effects of a Gamified course on student motivational learning habits. While the effects varied between the different types of students, there was a clear positive affect throughout the class's learning habits. Equally motivating to males and females, Gamification, from the findings, met the students at their needs. Those who previously struggled found a great way to visualize their work, manage their procrastination, and solve problems. Those who previously excelled were able to go even further without needing to wait. Those who fell in the middle took a little bit of each, appreciated the increased ownership and responsibility, and sought to manage their own path through the course. Even for the students who did not find it significantly different than traditional methods stated, "it can only help if it does anything". This study reveals Gamification to be a potential method of increasing motivational learning habits and, consequently, improve student learning. Improved execution of Gamification elements may offer even greater improvements in years to come. This study demonstrates that Gamification can have a positive impact in course design, and stands as a valid educational model.

Appendices

Appendix A

Game-Based Learning Interview Protocol

Time:

Date:

Interviewer: Daniel Harrold

Interviewee Code #:

Purpose:
In this interview, participants will be asked to reflect on their perceptions of their own learning habits including self-efficacy, motivation, and self-regulated learning, as well as their perceptions of the game-based learning treatment. Participants will be reminded that their responses will have no bearing on their performance in the course and participation in the interview is strictly voluntary and will require parental consent.

(Inform the participant of confidentiality and give the informed consent to be read and signed)

Questions:

1. When given a task in a school, what affects your confidence in your ability to carry out the task? How does your confidence affect your ability to complete the task?

2. When given a task in school, what, if anything motivates you to complete the task? Does your motivation come from external sources or is it a personal objective?

3. When given a task in school, describe the process you follow to execute the task. For example, if given a week to write a paper, describe the steps you follow to ensure it is complete?

4. Reflect on the design on the Gamified learning course you are currently enrolled in. What elements, if any, have you found most appealing as opposed to other courses?

5. Reflect on the design on the Gamified learning course you are currently enrolled in. What elements, if any, have you found least appealing as opposed to other courses?

6. What effect has the Gamified learning model had on your overall motivation to complete tasks? Are you more motivated, less motivated, or no change? Explain why.

7. What effect has the Gamified learning model had on your overall confidence to complete tasks/use technology? Are you more confident, less confident, or no change? Explain why.

8. What effect has the Gamified learning model had on your overall working process to complete tasks? Explain your answer

9. Describe your experience in the Gamified learning model with the four different assignment types: Understanding, Explore, Synthesis, and Test.

10. Any final comments, successes, failures, stories, or experiences about the game-based learning curriculum you feel would be useful?

(Thank the individual for participating in this interview. Assure him/her of confidentiality of responses and the possibility of future interviews. Complete follow-up comments on the back)

Appendix B

Gamified Learning Observation Protocol

Time:

Date:

Observer: Daniel Harrold

Length of Activity:	
Descriptive Notes	Reflective Notes

Appendix C

Student Observation Data

Students	Frequent behavior	Positive Traits	Negative traits
Overall	Students work consistently but not constantly. They will waste time, and then work quickly to catch up	Very driven during individual assignments, work silently and efficiently, finishing before the deadline	Distracted at group projects in close quarters. Need space to spread out at times. Not always good uses of time
1	Always on task, generally either reading a book on somewhere on the computer	Talks with the instructor often about questions. Constantly engaged in the assignment, helps others	Seems off kilter with the class, not disruptive, but not on the same page with others
2	Works independently, Either on other websites or talking with the instructor	Very amiable, particularly with the instructor, engages, helps others complete assignments at times	Does very little, sometimes distracting to others in volume
3	Almost always on-task. Sits quietly and works alone for most assignments	Engaged in something at all times, works well with S11	Does not ask many questions, doesn't seem to contribute to class discussions
4	Always busy, but not always on the task at hand. Very inquisitive	Very friendly, does not disturb others, and works well if needed	Does not seem to be following the set schedule. Rarely works with others
5	Off task very often. Usually walks around the room talking to others	Does not seem loud or disruptive, appears civil at all times. Helps on assignments if asked	Distracting to others Doesn't seem to have anything to do.
6	Very cheerful, talks a lot with S8 and the rest of the group, Works in spurts	Asks many questions and talks with the instructor a lot during question time	Off task with S8 quite a bit. Very loud, though work is always complete early.
7	Model student, friendly, stationary, works consistently on all tasks	On task at all times, rarely distracted. Works well with others.	Group can sometimes get a bit chatty, but only momentarily. Always back on track.
8	Off task far more than average, talks or on the phone throughout the class	Asks the instructor questions and eventually gets work done,	Talks to S6 often, yet does not complete work as quickly, Lacks focus
9	Always on the	In the second half of	First half of

	computer or on the phone, talks quietly to his neighbor throughout	observations, stayed after class, worked very hard to catch up	observations, not on task at all. Spent lots of time asleep or on the phone, or talking
10	Always on point, rarely talks to others unless for a group project. Works constantly	Asks questions, works ahead, doesn't talk to others, and not distracted by neighbors	Does not seem to participate in group projects, sits out of assignments at times
11	Participates more than anyone else in class combined in full class sessions	Very animated, gets into group readings, able to carry group projects single-handedly at times	Distracted and distracting often, works with S3 & sometimes leads him off task
12	Works alone on most things, seen talking to the instructor a lot, more than others	Frequently talks with the instructor about extra-curricular opportunities	Does not work with others, lets another group do a project without her
13	Absent often, and distracted by an non-interviewed neighbor Still participates	When present, works on assignments in a pleasant way, Not always on point.	Easily distracted in group settings, though does well in individual tasks, Frequently absent
14	Non-descript, At her computer often, doesn't talk much	Appear on task though sometimes just sitting at the computer	Contributes little to full class or group work

Appendix D

Summary of Self-Determination Responses

Student	**General Motivation**	**Motivation in Gamified Course**
1	Currently highly self-motivated, came from parents, and still continues.	More motivated in this course, more rewarding for completing tasks, made work faster/better, XP extremely motivating
2	Personally motivated, competes with self, desire to be the best, comes from sports	More motivated, prepares you for the real world being independent,
3	Motivated by schedules and grades	Just as motivated, little focus on the game-elements.
4	Motivated by self, task, parents, "don't expect anything from work"	Keeps pace for his own sake, unaffected by game elements
5	Personal work ethic, driven by parents and grades	Little change in personal motivation, "could win" but doesn't. Helps others
6	Motivated by personal anxiety, friends, family, self	Motivation is to beat others, prove she's better because mastery makes it too equal
7	Motivated by self, BSc are unacceptable, pushed by parents	Motivation is more self-inspired since I choose the work, better quality
8	Unmotivated in the past, now wants decent grades for college	Much more motivated to get the XP, clear on what's required to pass
9	Only motivated by things that interest, that or "grades".	More motivated, getting XP better than earning a grade
10	Highly motivated to complete tasks, comes from self and parents	Less motivated when doing group work, but personally motivated by competition, XP
11	Motivated to be perceived as the best, likes to show off. Grades are not a big deal	Personally motivated due to high visualization of progress, though still seeks a class audience
12	Very motivated for grades and success prior to the course	More motivated because there's actually more she can do.
13	Not very motivated, wants to pass easily but that's it	High levels of organization & confidence yield motivation
14	Motivated more in the past, not as much now that she's a senior	Doesn't see much of a change compared to years past

Appendix E

Summary of Self-Regulation Responses

Student	General Organization	Organization in Gamified Course
1	Clear focus on planning, always plans before beginning a task, "thorough", "complete"	Plan more than normal, able to work farther ahead so I took advantage of it
2	Starts with known factors, works from there, always tries. Works in advance and then edits last minute	Lack of small goals leads to creation of large goals, inspired to organize even more.
3	Starts early but procrastinates a lot	Little change in organization, likes the options, doesn't always use them
4	Conducts personal research, finds out as much as possible, multi-tasks	Just as organized, completes tasks as assigned
5	Spaced out but procrastinates towards the end, somewhere in the middle	No change in organization, neither positively or negatively
6	Plans out ideas early, finishes the rest in the final few days	Appreciates freedom to manage time and stress, busy senior lifestyle though has been chaotic
7	Works a bit in advance, slacks until final few days	More organized because he has to be, responsibility placed on the student
8	Slacked a lot, did it last minute, if at all	More organized due to software, scaffolded nature, visual elements
9	Did a little work each day, but procrastinated, no plan	More organized, everything is online, clear structure
10	Little to no procrastinating ever. Always on top or ahead	More organized by personal choice, makes decisions to work ahead
11	Heavy procrastinator Thinks a lot but puts things off until the end.	Still procrastinates but empowered by the flexibility to catch up on my own schedule
12	Never procrastinates, works ahead for her own value	Continues to work very far ahead because she can
13	Huge procrastinator, does everything last minute	Still procrastinates but forced to manage schedule with others. Keeps pace with the main group
14	Does everything last minute, sees herself as lazy	Still procrastinates but able to set schedule and take ownership

Appendix F

Summary of Self-Efficacy Responses

Student	**Confidence**	**Confidence in Gamified Course**
1	Frequently confident, completes work because it's assigned, seeks out help right away	More room to experiment, interested in a class I normally don't like. Tried new things.
2	Almost always feels confident, asks for help if needed, but rarely,	Always tries to go beyond the safety net, learns from mistakes. Tries undesirable assignments for fun!
3	Asks for help but not always, rather vague answers	More confident, able to learn from mistakes
4	Asks for help but sometimes embarrassed, prefers this course's method	More confident, goes above and beyond, acquires more books
5	Doesn't turn in bad work, asks questions first of others, then teacher	No confident as I'm always trying to turn in solid work
6	Asks lots of questions whenever help is needed. Never shy to ask	Never needed the second chance, but feels better knowing it's there
7	Always feels confident, never quits, asks friends then instructor	Great learning from mistakes rather than putting them away and forgetting it
8	Rarely feels confident, asks friends, rarely asks teacher	High level of steps and structure makes student more confident, they find the tools and use them
9	Confidence enough to pass, not overly ambitious	Tools are provided for success, ability to try and fail but learn from it
10	Very confident, asks for help when needed	More confident with focus on understanding and mastery, not rubrics only
11	Large ego, likes to solve problems himself without asking, proud of work	More confident with individual steps, system set up well
12	Asks friends but not the instructor	More confident, feels she can ask more questions
13	Asks friends, but not the instructor very often if ever	More confident, can visualize what needs done
14	Asks friends if needed, but not often	More confident with her ability to fix mistakes

Appendix G

Perception Responses

Student	Negative Gamification Perceptions	Positive Gamification Perceptions
1	Not good for overly complicated subjects, needs better balance of XP, more challenges for those farther ahead	Best part, work on my own pace, group elements, don't have to wait, collaboration, online access.
2	Not always equitable, problematic for those too far ahead.	Hugely available, no need to wait, something to work on everyday, no need to be stuck waiting for the teacher, similar to real life
3	More focus on student generated questions, people too far ahead are problematic	Freedom to plan schedule is beneficial, focus on getting in depth, beyond busywork
4	Make all large assignments required, remove "gaming" the system	Excellent way to learn, leads to more personalized learning, don't feel ashamed asking questions
5	Too much freedom can be overwhelming for others, too much online	Computers are more engaging, freedom to choose own path without following a strict level. Simplicity.
6	System does not adequately punish those who follow instructions but do less effort/reward overachievers	All assignments have a purpose, direct instruction when needed, work is done when I want
7	None	Freedom and flexibility preferred, able to take responsibility, great group work and video lectures
8	Sometimes groups talked too much, including her own	Freedom, clear structure, use of videos all positive, first time she tried in class
9	Learning curve in some software tools, make assignments more fluid	Much better variety, different, making videos in groups was powerful, tools to succeed
10	Technical issues and not as difficult as AP, but still valid	Favorite English course so for, flexibility makes for more valuable work, likes mastery
11	Need more full class interaction	Most motivated class all year, encouraged to set goals and see progress
12	Dislikes having to work with others, likes to create alone	Enjoys the ability to work ahead and achieve on her own
13	Lack of due dates and presence of classmates can be distracting	Enjoys the ability to choose assignments, pick path, and succeed
14	Need more due dates at times, groups can be difficult	Enjoys group video projects, discussion board, flexible due dates.

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