THE EFFECT OF GAMIFICATION ON STUDENTS'

ENGAGEMENT AND MOTIVATION

IN THREE WSU COURSES

By

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Abstract

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The purpose of this study was to explore the effects of the use of gamification on students' motivation and engagement in the college environment. The study was conducted at Washington State University in three university courses. Forty-four students and three professors participated in this study over the course of six months covering two semesters: Spring and Summer of 2017.

The study followed the guidelines of convergent mixed-methods design where qualitative and quantitative data sources were used to ensure triangulation. A total of fifteen participants, including twelve students and the three faculty members, were interviewed. The qualitative components of the mixed-methods design were supported with the selected evidence based on interviews, observations, documentary, and artifactual data. The quantitative data were supported through multiple regression results based on survey in addition to frequency results which were worked in discussion side by side with qualitative components. Game metrics and game scores were incorporated where they were deemed relevant.

The main findings of this study were that gamification positively affected students' learning in their respective courses. This was demonstrated through their increased motivation to learn, their promoted engagement to participate and collaborate, meeting their psychological needs of competence and autonomy, and their improved appreciation of the task value in addition to task completion. The study showed avatars, quests, and the fun components to be the most effective gamification elements in fostering motivation and enhancing engagement. However, the findings showed that some game features, such as points and badges, had either no influence or a negative effect on students' motivation and engagement.

Based on this study, gamification facilitated a learning environment supportive of reading and writing literacy skills. Additionally, it fostered a number of desirable behaviors and attitudes in the learning environment such as increased participation, altruism, the desire to try multiple times, and the positive change of beliefs toward the use of instructional technology. The study highlighted the need to consider contextual differences among students and professors when applying gamification, specifically in the college environment.

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Dedication

This dissertation is dedicated to my mother, Salha, who introduced me to the pleasure of reading

and to my father, Salah, who spent his entire life working hard to support our family. Last but

not least, I am dedicated for my wife, Dina, for her endless support.

CHAPTER ONE

INTRODUCTION

Timon of Athens once admonished Apemantus with these comments: "In general riot melted down thy youth / In different beds of lust and never learn'd / The icy precepts of respect, but follow'd / The sugar'd game before thee" (Shakespeare, trans. 1995, 4.3.255-258). This idea of games as being a distraction from more serious tasks is not unique to Timon of Athens but also to many cultures, especially American culture. This is manifested in the metaphors we live by such as "He is playing games!" or "She is gaming the system."

I remember my father said to me once: "Don't waste your time on this!" He was referring to Pong, the first retro tennis video game, which I played a lot during my childhood. There is a negative atmosphere still surrounding video games as containing inappropriate language and content. Despite my father's remarks, I always thought this negative categorization of video games was unfair and inaccurate. As I grew up and began playing more advanced video games on PlayStation and Xbox, I became more interested in their potential. I became particularly absorbed in the online collaborative environment, the critical thinking skills needed to solve problems and overcome challenges, and the virtual environment. Gee's (2003) landmark work, *What video games have to teach us about learning and literacy*, rekindled my passion for conducting research on this topic.

During my career as a middle school teacher in Seattle, Washington, and later on as an educator in vocational college environment overseas, the lack of motivation to learn and the declining engagement many students manifested was apparent. For the growing number of students who lack interest in learning, non-traditional methods of instructions may be a possible solution. Could the features that made video games so attractive to players foster learning,

motivate and engage students? My interest in gamification, the use of video game elements in non-game contexts, was born as a result of my combined passion for education and video game playing.

A significant problem that many schools and educators face, as Zichermann and Cunningham (2011) posited, is that many students lack the motivation and exhibit low interest to learn. If given a choice, many of them would prefer playing video games than reading a book or completing a homework assignment. The solution is not, as many educators, policy makers, and politicians suggest, resolved by creating additional educational standards or adding more standardized tests in an endless cycle of trial and error. One of the possible ways to make education more relevant to real life skills and more engaging to the learners is the use of gamification. Prensky (2001) enthusiastically presented the solution to learners' disengagement through the marriage of education and entertainment; thus, the term *edutainment*. Some proponents of gamification, such as Zichermann (2010), are for more *–tainment* than *–edu.* Prensky (2001) argued that there was no magical recipe, but that teachers can design the perfect mix of education and entertainment depending on their students' needs.

According to Prensky (2001), game features can provide the *–tainment* part of the educational design needed to engage learners. Borrowing game elements and incorporating them into the classroom environment can facilitate engagement. Since Prensky (2001) proposed his solution to reengage learners, there has been limited implementation of game features in the learning environment. Similarly, little research has been done on the effect of gamification on motivation and engagement of learners. The research literature connected to gamification is limited on multiple levels and is mostly focused on selective game features, usually rewards, applied in non-pedagogical areas. There is a need to explore the effect of gamification in

promoting and sustaining learners' motivation and engagement, specifically in the college environment. This research hopes to add to the handful of studies conducted on the effect of gamification on learners' engagement and motivation.

Gamification has been critiqued by some researchers as mostly a technocentric idea that is sacrifices content for digital technology (Burn, 2016). Bogost (2011) saw gamification as a process that took from games the least engaging elements, such as points and rewards, which he considered as symbols of extrinsic motivation and incidental. He argued that the most engaging elements in video games are connectivity and the cooperation that the players share in the game environment and not points or rewards. Hughes and Lacy (2016) agreed with Bogost (2011) that points and rewards are the least interesting parts in video games because players do not value them as such but rather the agency that produces such symbolic rewards. However, Hughes and Lacy (2016) attributed the cause of the occasional failure of gamification in some settings to design failure and lack of understanding of how video games work on the player psychology to produce motivation, diligence, and learning. A conclusion cannot be reached in response to this criticism without a full evaluation of the use of gamification in education which is a possible contribution of this dissertation.

Gartner (2012) emphasized the importance of field study in choosing the gamification strategies appropriate for different contexts. As an emerging field in education, there were few examples applying video gaming in a pedagogical context in a university environment. Furthermore, due to variations in course content and objectives, no single game design can fit all. Experimenting with the most effective video game features, such as avatars, quests, online collaboration, points, and badges, was necessary before attempting to gamify any learning content. In order to do so, I conducted a pilot study on gamifying a college course in

collaboration with an English faculty member at Washington State University in the Fall of 2016.

This pilot study, which lasted for two months, involved the gamification of an English writing and research honors course designed for freshmen students with distinguished academic performance. Video game elements such as avatars, quests, points, and badges were incorporated into different parts of the course content and syllabus. To ensure that the implementation of gamification was not superficial or partial, essential course components were gamified and assigned value in terms of the final grade. For example, the main writing assignment involved creating a life-like avatar of a different race using an online tool and writing an essay about the politics of beauty and representation. Another gamified event was the gamified cultural simulations, which were life-like negotiations originally created by a former CIA agent to train diplomats, involving technologically advanced and economically superior nation, and a poor third-world country trying to get financial aid while still striving to preserve its sovereignty.

The pilot study showed that some gamification features such as the avatars, quests, and the game quizzes worked well with the students and seemed to go along with the course objectives. Other gamification elements such as points and badges did not motivate these particular students who were largely self-motivated. Accordingly, the course instructor expressed some skepticism about their effectiveness. The pilot study only intensified my curiosity to further investigate the effects of gamification in the college environment and helped develop data collection instruments such as surveys and interview questions for my subsequent research. I desired to expand this project to other courses taking into consideration variability in context, course content, and students' and professors' background. As I was able to secure three research

sites, the research question for this dissertation became: *What is the effect of gamification on students' motivation and engagement in three Washington State University college courses?*

Overview of Dissertation

This research study is organized into six chapters. Chapter one provides a brief explanation of what brought me to this dissertation, my prior experiences and influences, and the research question being investigated.

Chapter two, the Literature Review, includes an overview of the literature related to the research on gamification. It discusses a review of literature on definitions of gamification, theoretical connections, video game features, examples of gamification projects, and implementation guidelines.

Chapter three, Methodology, describes the research sites, the participants, the data collection, and the data analysis.

Chapter four, Data Presentation and Analysis, focuses on presenting the qualitative and quantitative data collected in the three Washington State University sites, analyzing them, and concluding with summarizing paragraphs for each section. This chapter also presents the findings of this research study in regard to the effects of gamification on motivation and engagement.

Chapter five, Conclusion and Implications, presents conclusions and implications for the readers.

CHAPTER TWO

LITERATURE REVIEW

The digital game culture spreads among a large proportion of the world's population where parents are getting involved in the video game play and the average age of video game players is no longer in the teens (28% under 18 years, 29% 18-35 years, 20% 36-49 years, and 23% 50+ years) (Statistica, 2018). Parallel to that is the increased attention surrounding the use of video game elements in non-game contexts or gamification (Ludgate, Becker, & Johnson, 2015). Gamification is a coined term that reflects a social phenomenon arising with a generation of digitally literate people. It was estimated that by the end of 2017 there will have been 2.21 billion gamers worldwide, and this number is expected to increase to 2.73 billion by 2021 (Statista, 2018). In recent years, educators have been desiring to harness the popularity of video games by increasing engagement and improving learning (Goehle, 2013).

Gamification is the use of game-based elements, techniques, and game strategies to promote learning through increasing engagement, fostering motivation and supporting critical thinking skills (Kapp, 2012). This operational definition, which will be used throughout this dissertation, incorporates important several pedagogical components. First, the application of gamification to promote learning is contrasted to business applications. Second, digital game elements, which include, but are not limited to, avatars, badges, points, levels, leaderboard, virtual rewards, and quests, are highlighted. Third, there is reference to game strategies, which is focused on game elements that allow for social interaction between players. In addition, motivation and engagement are included in this definition as possible effects of gamification. The fourth pedagogical component in this definition is the emphasis on critical thinking skills, which are essential to learning and could be partially promoted through gamification.

Gamification has a strong presence in military and business settings, yet its emerging application in an educational context is gaining support among educators and researchers. Ludgate, Becker and Johnson (2015) argued that educators recognized that effectively designed games can promote large gains in productivity and creativity among learners. Although non-digital game components have various applications in teaching and learning, the focus of this dissertation is on the digital video game elements that are used in pedagogical contexts as possible ways to promote task engagement, increase motivation, and enforce desirable learning behaviors.

The rationale behind employing video game elements for pedagogical purposes is that they have already captured the attention of millions of loyal players all over the world. However, popularity should not be the sole reason to justify drawing elements from video games and utilizing them in education. Gee (2003) listed thirty-six pedagogical principles that can be drawn from video games and applied into an educational context. One of these essential pedagogical principles is the use of critical thinking skills in which video game players engage and are highly desirable in education. Folmar argued in 2012 that in the United States, about 58% of the population played video games. Unlike the general assumption, he added, the average age of video game players is thirty with almost a balanced percentage of males and females and an increasing number of parents engaged in playing video games with their children.

Table 2.1 shows the low frequency and the emerging nature of the field of gamification as reflected in the four terms in a search: gamification, game-based learning, serious gaming, and educational games in databases ERIC, SAGE, ScienceDirect, and GoogleScholar. The ERIC database yielded sixty-four search results on gamification with three books and sixty-one

Table 2.1

Database Search Results

Database	Gamification	Game-based Learning	Educational Games	Serious Games
ERIC	64	16,266	11,149	6,507
SAGE	276	92,557	41,472	37,834
ScienceDirect	648	213,648	42,072	55,270
GoogleScholar	29,000	3,340,00	2,260,000	2,030,00

references. References refer to encyclopedia entries and articles in handbooks. Narrowing the

search within ERIC produced seven different topics: Business and management, education,

media, communication, cultural studies, politics international relations, and sociology. Table

2.2 shows some of the ERIC references used in this literature review.

Table 2.2
ERIC References Used

Author & Year	Content	Relevance
Armier, Shepard & Skrabut (2016)	Course assignments	Participants' perceptions
Banfield & Wilkerson (2014)	Teaching and learning	Intrinsic motivation
Barata et al., (2014)	Learning experience	Game elements
Cheong, Filippou & Cheong (2014)	Learning	Effect on learning
Codish & Ravid (2014)	College courses	Game mechanics
Dominguez et al. (2013)	Gamifying an e-learning platform	Gamification implications
Geelan et al. (2015)	College students learning experience	Students' perception of the use of gamification
Goehle (2013)	Gamification use in education	Aiding web-based homework
Hughes & Lacy (2016)	Gamification in the library system	Potential and limitations
Kingsley & Grabner-Hagen (2015)	Learning	Gamification as a learning tool

Many of the results in the Sage database on gamification had little to do with the effect

of gamification on students' motivation and engagement and were more focused on computer

games, social media, history of educational technology, video games used in medical training,

business applications of gamification, and online learning. Table 2.3 shows the list of SAGE

sources used in this literature review. All in all, the results reflected the emerging nature of the

topic of gamification as compared to other game-based topics.

Table 2.3
Examples of SAGE References Used

Author & Year	Content	Relevance
Bull (2016)	e-games as educational tools	Discussion of gamification use
Burn (2016)	e-learning	Critique of gamification
Carr-Chillman, 2015	Games in elementary and middle school	Definition and reference to gamification
Kennedy & Allen (2017)	Data visualization	Gamification as a tool for data visualization
Hess & Saxberg (2014)	Applying learning science to technology.	The value of gamification.
Ludgate, Becker & Johnson (2015)	Engaged learning	Using gamification to engage learners
Nicholson, 2015	Digital gamification systems	The use of gamification in an educational context
Stork (2015)	A book chapter on e-learning	The potential benefits of gamification
Swanson & Ferguson (2014)	Teaching strategies	Gamification in instruction
Whitton, 2015	The use of games for adult learners	The use of gamification in learning and instruction

In many studies, students' levels of engagement increased significantly following the

introduction of game elements. The following inclusion criteria were used in the summary of

literature review on gamification as illustrated in Table 2.4. Literature included articles and

conferences proceedings published after 2012 through present day. The studies were obtained

through the Washington State University (WSU) library data system and some of them were

made available through the interlibrary loan network. In addition, some conference proceedings

were obtained through GoogleScholar. All the studies were read carefully for the theoretical

foundations on which the study of gamification was founded, the gamified content, the number

and age of the participants, and the results.

Table 2.4
Summary of Literature Reviews on Gamification

Reference	Gamification Features	*R	Gamified Content	Theoretical Connections
Barta, Gama, Jorge, Gonclaves (2013)	Badges, points, challenges, leaderboards, levels	P	Computer engineering course	N/A
Berkling & Thomas (2013)	Levels, leaderboards, points	N	Software engineering course	Motivational theory
Betts, Bal & Betts (2013)	Levels, choice elements	P	Online learning tool called *Curatr*	N/A
Brewer et al. (2013)	Points and rewards	P	Children's learning	N/A
de Freitas & de Freitas (2013)	Rewards, points, levels	P	Computer science class	N/A
Eleftheria et al. (2013)	Points, badges, challenges,	P	Augmented reality science book	N/A
Gibson et al. (2013)	Badges	P	N/A	Intrinsic and extrinsic motivation
Goehle (2013)	Levels and points	P	Homework WebWork	N/A
Hanus & Fox (2015)	Leaderboard and badges	P	Two college courses	Cognitive motivational theories
Kingsley & Hagen (2015)	Badges, points, quests	P	3D GameLab software.	New literacies studies
Kumar & Khurana (2012)	Badges, points, levels	P	Teaching programming languages	N/A
O'Byrne et al. (2015)	Badges	P	Youth program	New literacies studies
Leaning (2015)	Leaderboard and points.	M	e-media-course.	Situated motivational affordance

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Reference	Gamification Features	*R	Gamified Content	Theoretical Connections
Todor & Pitic (2013)	Rewards, points, badges	P	Course in electronics	N/A
Raymer (2013)	Rewards and progress bars	P	e-Learning software	Behaviorism
Thom, Millen & DiMicco (2012)	Badges, points And status	**N	Social network service	Intrinsic and extrinsic motivation

*Note*s. *R= results: P= positive, N= negative, and M= mixed. **The removal of video game elements resulted in participation decline.

This literature review will be organized around these themes: conceptualizing gamification, theoretical connections to gamification, advantages of gamification over game-based learning, connecting gamification to motivation and engagement, fun and play in gamification, player types and gamification features, gamification in action, and implementation guidelines.

Conceptualizing Gamification

There is no consensus on the definition of gamification among researchers, nor is there an agreement on the difference between game-based learning (GBL) and gamification. Kapp (2012) discussed the definition of gamification in a pedagogical context contrasting it to GBL. According to Kapp (2012), the instructional strategy is changed to accommodate game elements where, instead of the learning objectives, the teacher in a gamified classroom will present a challenge or quest that the players will need to undertake leading them to the learning experience.

Sixteen research articles defined gamification as the use of game elements, mechanics, features, design, and structure in a non-game environment or context e.g. González et al., 2016; Attali & Arieli-Attali, 2015; Dale, 2014; Deterding, 2012. This non-game environment is broad

enough to cover the wide application of gamification in business, such as Zichermann and Cunningham's (2011) definition: "The process of game-thinking and game mechanics to engage users and solve problems" (p. xiv). Gamification, according to Simões, Redondo, and Vilas (2013), is the utilization of game mechanics and game dynamics in "non-game applications" (p. 348). These authors' definition was focused on the social aspect of gamification, such as collaboration. Collaboration here refers to how the learners engaged in gameplay interact and support each other in the gamified environment. Leaning's (2015) definition of gamification as an experience outside of gaming context is as broad as the previous definitions.

Other explanations of gamification are more focused on the critical thinking skills which are usually used in games and can be activated in non-game contexts (Farber, 2013). There are some definitions where the pedagogical applications of gamification are emphasized. Kingsley and Grabners (2015) posited that gamification should be understood as a combination of "content area instruction, literacy, and 21st century learning skills in a highly-engaging learning environment" (p. 51). In the eyes of Hamari, Koivisto, and Sarsa (2014), gamification becomes more complex with specific focus on motivational affordances and change in behavior as an outcome.

Folmar's (2015) characterization of gamification captured an important idea in the application of gamification in learning and other fields: game thinking. He understood gamification as the use of game thinking and game mechanics for non-game purposes. Zichermann (2010) considered the lack of game thinking when using gamification in an educational context as the chief reason for its occasional failure in different contexts. Game

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thinking, Folmar (2015) explained, mandates rethinking teaching practices, not just adding game elements without considering how gamification works.

It is important to explore the theoretical foundations to this research paper before discussing in detail the connection between gamification, motivation, and engagement.

Theoretical Connections to Gamification

The knowledge base connecting gamification to theoretical principles is thin and the empirical research on gamification founded on theoretical principles is scarce. This could be attributed to the recency of the topic of gamification, especially in the field of education. When Seaborn and Fels (2015) examined 32 peer-reviewed studies on gamification, only ten of them were founded on theories (five by the same author) and the remainder had no connection to theoretical foundations. Seaborn and Fels (2015) stated that many theoretical principles proposed to study gamification are unexamined and practical gamified approaches are not founded on theories. They argued that research on gamification is lacking reference to theoretical principles and theories are empirically unexamined, highlighting the need for empirical participants-based research. This amplifies the need of research on gamification with strong theoretical links that bridge the gap between theory and practice. In understanding the connection between gamification, motivation, and engagement, three theories will be discussed in depth: self-determination, new literacies study, and behaviorism.

Self-Determination Theory

Motivation and engagement, as a major focus of this study, are at the heart of the self-determination theory of human motivation. Self-determination theory (SDT) rests on the three principles of autonomy, competence, and relatedness (Deci & Ryan, 2008; Seaborn & Fels, 2015). According to Baard, Deci, and Ryan (2004), competence is connected to the motivation

to overcome challenges and achieve success. The need for autonomy, they added, relates to volition and choice-making in pursuing and being responsible for one's actions. The need for relatedness is about social status and a connection with others based on mutual respect and interdependence. The three elements of SDT constitute human psychological needs to make choices, to compete and collaborate with others; all of which can be afforded in the gamified environment.

Many players in a gamified environment, according to Gee (2003), create their own avatars, choose to play the game competitively, and work with others in affinity groups (autonomy and volition). Many players feel satisfied as the results are displayed on leaderboards of the gamified environment they engage in highlighting the social element of relatedness. Studies have shown that the elements of SDT positively affected intrinsic motivation. For example, Deci and Ryan (2008) noted that "considerable research has found interpersonal contexts that facilitate satisfaction of the basic psychological needs for competence, autonomy, and relatedness to enhance autonomous motivation, which comprises intrinsic motivation and well-internalized extrinsic motivation (p. 14).

Researchers have established a connection between video game elements and motivation, on one hand, and self-determination theory (SDT), on the other hand. When players were engaged in the gamified environment, they willingly immersed themselves in virtual challenges for the purpose of achieving fun and play; elements deeply rooted in human beings. For instance, Francisco-Aparicio, Guti'errez-Vela, Isla-Montes, and Sanches (2014) reasoned that intrinsically motivating activities are the ones which participants consider inherently interesting and freely engage in for the mere pleasure of carrying them out.

New Literacies Studies

New literacies studies (NLS) is an extension of the new literacy theory with a special focus on the digital environment as a semiotic domain for taking and processing meaning. Digital literacy, afforded by modern technology, allows for meaning to exist outside of language systems. Furthermore, in the NLS theory, meaning is considered beyond the digital tools as it "involve [s], as well, ways of acting, interacting, valuing, believing, and knowing as well as often using other sorts of tools and technologies" (Gee, 1997, p.10). The new literacies studies is an umbrella term for all kinds of digital literacies which include taking in and processing meaning (Gee, 1997).

Gamification is a form of digital literacy in which many layers of meaning-making and processing take place. One of these modes of learning is the affinity groups and the many forms of social interaction in the digital game environment (Gee, 2003). Consequently, behaviorism, which is built on promoting an individual's behavior, conflicts with new literacies study that seeks to find meaning outside of the individual through and in the social environment (Gee, 2005). These seemingly conflicting premises of the two theories of behaviorism and new literacy studies may be reconciled by drawing elements from both theories as they pertain to the learning atmosphere afforded by gamification. Challco et al. (2015) argued that gamification allows for learning to happen individually as the learners feel extrinsically motivated through gaining points and winning awards. At the same time, the social aspect of gamification through collaboration and competition, they added, is very important. Thus, the use of both behaviorism and new literacies studies is justified as theoretical foundations to understand gamification.

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Behaviorism

Folmar (2015) considered the real power of gamification in its ability to produce desirable behavior change. Some researchers have defined gamification from a behaviorist-scientific perspective as a designed-behavior change through playful experiences (Reiners & Wood, 2015). According to González et al. (2016), gamification can produce significant behavioral change at an early age using the dynamics of games. Dale (2014) explained this connection between gamification and behavioral science because gamification rests on motivation, ability level, and triggers. Embedded in gamification are behavioral elements such as rewarding and penalizing through points and badges or upgrading and demoting in a game setting.

Skinner (1984) realized the connection between behaviorism principles and some of the elements in the simple video game Pac-Man, especially the play and reward system. He considered true success lies in driving students to task completion through well-designed instructional programs. Skinner (1937) coined the term *operant conditioning* referring to a method of learning resulting from the rewards and punishment of behavior. Staddon (2003) defined operant conditioning as the "study of reversible behavior maintained by reinforcement schedules" (p. 115).

Chou (2013) posited that fixed and variable reinforcement schedules are both used in the gamification design. However, the fixed reward, which he named "earned lunch," is less engaging than the variable reward schedule, which he called "mystery box" (p. 1). Whereas, the fixed reinforcement schedule, in the context of gamification, has resulted in low engagement levels immediately following the reward or penalty, variable reinforcement

schedule, as the element of surprise is activated, has produced higher engagement levels in the gamified context (Raymer, 2011).

Before discussing the effect of gamification on engagment and motivation, it is important to discuss the difference between gamification and game-based learning (GBL).

Advantages of Gamification over Game-Based Learning

Proponents of gamification propose that it has a lot of advantages over educational games. Before discussing the logic behind this argument, it is important to understand some game terminology. Game-based learning is intended solely for education and relies on a learning game that has a beginning and an end. Serious gaming is a broader term used to describe games intended for education, industry, training and simulation (Connolly, Boyle, MacArthur, Hainey & Boyle, 2012).

Gamification and game-based learning are areas of confusion and misunderstanding for many educators and game designers. Gamification, and game-based learning are distinctively blurred for Nah, Telaprolu, Rallapalli, and Venkata (2013). They understood the process of incorporating video game elements into an activity or a process as changing it into a computer game. Gamification occurs not when learning is changed into a computer game but rather when adding a design layer of game elements to enhance learning, increase engagement, and encourage positive behavior (Kapp, 2012).

Keeler (2014) posited major differences between gamification and game-based learning. Game-based learning is realized as learners play games to learn content. In contrast, gamification involves the deployment of game elements in an environment outside of digital games. Issacs (2015) also made a clear distintion between the two approaches noting that

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gamification creates an atmosphere associated with gameplay and conductive to learning while game-based learning relies on a game as a vessel for learning content.

Simões et al. (2013) elaborated upon how gamification works differently from game-based learning in the classroom. Gamification utilizes the most effective components of video game elements without committing to a specific game resulting in increased levels of motivation and engagement in the learning experience. Gamification in education is an ongoing process that harvests the most engaging game components and applies them to increase motivation and engagement among learners. It creates a long-term effect, as Folmar (2015) argued, on engagement and motivation as compared to game-based learning where engagement is short-lived, usually during the duration of the game. Once the game is completed, many learners or players do not have any more interest in a game they have mastered and completed. On one hand, gamification works by adding elements inspired from games to the classroom environment mainly to increase motivation, engagment, and promote desired learning behaviors, whereas game-based learning, on the other hand, relies on using games to meet learning outcomes. The learning is facilitated through playing games whether digital or non-digital.

In his support of gamification over game-based learning, Zichermann (2010) emphasized that the educational games industry had produced only a few successful games which were effective in combining learning and play at the same time. The last one, he claimed to be so, was *Where in the World is Carmen Sandiego* which came out in 1985. However, Deterding (2011) criticized, among other things, Zichermann's previous sweeping statement regarding successful educational games. McGonigal (2011) supported Zichermann's (2010) argument in advocating gamification and further elaborated on why educational games are

short-lived and do not meet the needs of the schools and educational systems. She argued that educational games are not sufficient to meet the growing needs of students and are at best a temporary solution. McGonigal (2011) joined Prensky (2001) in recommending the gamified path in teaching and learning which they thought could boost and sustain learners' engagement.

In the next section, motivation and engagement are explored further to see how gamification can foster them.

Connecting Gamification to Motivation and Engagement

Motivation and engagement are two closely related concepts which often overlap in areas of intrinsic motivation and cognitive engagement (Dornyei & Ushido, 2011; Guthrie, Willinger & You, 2012). Despite this strong link between motivation and engagement, the two terms are not synonymous and the presence of one does not necessarily dictate the occurrence of the other. According to Brooks, Brooks, and Goldstein (2012), motivation is linked to psychological elements that drive behavior and choice-making. Engagement, in the view of Russell, Ainley, and Frydenberg (2005), is an energy linked to different actions and tasks. Appleton, Christenson, Kim, and Reschly (2006) highlighted the importance of both motivation and engagement in learning but emphasized their separation as independent constructs.

Although the separation of motivation and engagement is an ongoing issue (Brooks et al., 2012), there are some areas where the relationship between the two is nuanced. Griffiths, Lilles, Furlong, and Sidhwa (2012) stated that engagement has evolved to include the psychological inner processes and the manifestation of that in human behavior in the form of task engagement, affective, and cognitive engagement. Willms (2003) emphasized the connection between psychological attitudes and the participation in school activities when presenting an operational definition for engagement. Other scholars focused on the observable

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aspects of engagement such as the learners' behaviors, their effort and dedication in performing schoolwork, and their levels of participation and attendance (Ryan, 2000).

Motivation and engagement are sometimes distinguished chronically in occurrence. Intrinsic motivation and prior attitudes about learning can be a precursor to task engagement and increased participation. Participation could work in the opposite direction changing negative prior attitudes. The combination of strong motivation and high task engagement facilitated successful learning experiences (Davis & McPartland, 2012). Engagement as an observable positive behavior (i.e. involvement in school activities) is driven by prior attitudes or as Ryan (2000) called them "beliefs" (p. 102).

Dornyei, and Ottó, (1998) presented a comprehensive definition of motivation as the progressively changing combined excitement in a person that starts, coordinates, organizes, ends, and assesses the intellectual and cognitive elements whereby introductory wishes and wants are chosen, organized, initiated, and (effectively or unsuccessfully) carried on. Motivation is divided by some researchers into five components: intrinsic and extrinsic motivation, task value, ability belief, and expectancies for success (Hsieh, 2014). Intrinsic motivation is triggered by human needs for mastery, curiosity, and overcoming challenges. Extrinsic motivation is relevant to elements not related to the task value such as rewards, grades, performance and competition or evaluation by others. Task value is the perception and the value of the task by the learners and whether it is beneficial for them or not. Finally, expectancy for success is how the learners expect to perform in the future as they engage in a specific task (Wigfield, Byrnes, & Eccles, 2006).

Intrinsic motivation, according to Ryan and Deci (2000), is essentially and inherently present in every human being driving the desire for exploration, overcoming challenges,

creativity, and most importantly, learning. They argued that contextual circumstances can ignite or subdue intrinsic motivational elements. Consequently, any successful game design needs to address these important innate psychological needs. In the context of computer games, Malone (1980) presented a seminal study on the heuristics for designing instructional computer games. He posited that both elements of intrinsic and extrinsic motivation are necessary in the virtual game environment. However, he suggested more emphasis on the intrinsic motivational constructs which make learning activities self-rewarding and not connected to external rewards. Furthermore, Deci, Koestner, and Ryan (2001) reviewed a meta-analysis which concluded that extrinsic rewards have been found to undermine intrinsic motivation.

Engagement indicates the passion and emotional involvement in participating and completing learning activities (Skinner & Belmont, 1993). Kuh (2009) tracked the evolution of the engagement construct throughout history from meaning the time learners spend on task, to the outcome and achievement of learning, the quality of students' effort, student interaction and immersion in the learning experience, and finally, his own definition, the quality and effort learners invest in an authentic activity. Notice that the common theme among all definitions Kuh (2009) discussed is the visible aspect of engagement as it is manifested in the learners' behavior toward the learning experience and the quality and time invested in the learning task. However, to equal engagement to time on task is unfair in capturing the full scope of this term. Schlechty (2001) argued that engagement is not simply synonymous with time on task, but it is "the enthusiasm and diligence" in doing the task that makes the engagement a reality (p. 64). Csikszentmihalyi (1997) emphasized this connection between engagement in a task and the overwhelming deep involvement of the learners that transcends time and space.

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Embedded within gamification are video game design elements which have the power to engage and motivate using achievable but challenging rules, leaderboards and competition, clear and steady progression, mystery and stimulating curiosity, and gripping narratives (Whitton, 2015). Researchers who have conducted empirical studies on the utilization of gamification elements agree on their positive effect on students' engagement, motivation, and overall performance through instant feedback and collaboration (Kingsley & Grabner, 2015; Koivisto & Hamari, 2014; Leaning, 2015; Papastergiou, 2009; Seaborn & Fels, 2015). The introduction of the gamification intervention produced improved performance with higher scores but with poor performance in written assignments and less participation in class activities, although the initial motivation was higher (Dominguez et al., 2013). Attali and Arieli-Attali (2015) proposed positive results showing higher likeability ratings with the introduction of gamification features. Higher likeability ratings referred to how students felt toward the game elements use in the learning environment. Some studies showed no connection between students' engagement and motivation, on one hand, and the introduction of gamification features to the learning environment, on the other hand (Hanus & Fox, 2015).

In a review of peer-reviewed empirical studies on gamification, Hamari, Koivisto and Sarsa (2014) examined 24 studies, and stated that most of them yielded positive results showing correlation between gamification and learners' engagement. Seaborn and Fels (2015) examined 32 studies on the utilization of digital gamification elements pedagogically. Twenty yielded positive results connecting gamification to increased levels of motivation and engagement. The remaining 12 studies yielded negative results showing no correlation between students' engagement and the introduction of game elements. Some empirical studies (Berkling & Thomas, 2013; Leaning, 2015) which produced negative or mixed results, focused on limited

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features of gamification, or forced the students to work with the game options available and failed to give them choice.

It is important when designing a gamified course to create a challenge, when possible, that is appropriate to the level of the students to maintain their engagement. Yet, a complicated challenge can have a reverse effect on engagement and cause a lack of interest, and even "anxiety and frustration" (Nicholson, 2015, p. 13). Malone (1980) posited that an overly complicated challenge leading to failure in a game setting can damage one's self-esteem and cause a lack of interest in reengaging the game. Nicholson (2015) divided engagement in the context of gamification into two categories: First, engagement in the form of interaction, cooperation, and altruism between the players (in a social manner). Second, engagement between players achieved through the utilization of game mechanics.

Francisco-Aparicio et al. (2013) argued that higher levels of extrinsic motivation when using gamification are not enough criteria to consider its benefits. The positive effects are usually temporary if not combined with self-determination theory principles of autonomy, competence, and relatedness (Nicholson, 2015). According to Zichermann and Cunningham (2011), one of the roles of educators is to help create circumstances that would allow for intrinsic motivation to be born. They suggested that extrinsic elements, such as points and badges, could be used to lead to this outcome and critiqued not targeting intrinsic motivation in gamification design. If no permanent positive behavior change is created in the learners, the long-term effects of gamification cannot be fully evaluated.

One of the steps in understanding the long-term effects of the gamification implementation in a pedagogical context is to combine, if data is available, the quantitative and qualitative research design. The majority of the research conducted on the effect of gamification

on engagement and motivation is either quantitative or described as mixed-methods design with a humble portion of qualitative elements (Seaborn & Fels, 2015). Among the few qualitative studies on this topic is by Banfield and Wilkerson (2014) who conducted 96 semi-structured interviews reflecting positive learners' experience with the introduction of gamification in the learning environment. Indeed, this conclusion regarding students' positive perception of the systems that use game elements was also highlighted by Cheong, Flippou, and Cheong (2014).

Fun is one of the elements which attracts video game players to engage in playing activities and keep coming back for more. Gamification borrows from video games the element of fun not only to gain the learners' engagement, but also to positively increase their motivation. In the next section, this connection between the component of fun in gamification and its effect on motivation and engagement is explored further.

Fun and Play in Gamification

Gamification provides the component of fun that helps in transforming the students' attitudes toward learning. Fun can allow for better learning, a concept that Prensky (2001) explained as he discussed the transformation in the learners' attitude toward learning. He elaborated that fun could be used in the learning process to create relaxation enabling learners to take things in more easily, and motivation by empowering them to put forth effort without resentment. McGonigal (2011) discussed the essential role of fun historically in the human experience. She referred to the story of the ancient Lydians who managed to live through famine on very limited rations distracting themselves from hunger through elaborate games.

Fun has been connected to gamification as one of the chief reasons for its utilization in settings which are considered mundane (Swanson-Ferguson, 2014). Video games, for many players, produce an emotional state induced by several factors, most important of which is fun.

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This feeling of fun is created in the players through their feeling of achievement, a sense of exploration, the reward of completing a level, or simply winning a game (Zichermann, 2010). If this element of play is incorporated into the learning experience, an intrinsic interest in learning can follow (Liebermann, 2006).

For many learners, the fun part in a gamified environment is the product of solving problems and overcoming challenges as they engage critical thinking skills. "Desirable difficulties," as Yue, Bjork, and Bjork (2013) called them (p. 266), are important qualities, according to Liebermann (2006), in the process of learning. As learners exert their best effort and become mindful of these challenges, "close attention and intense mental effort lead to deeper understanding [and] learning" (p. 386). Hess and Saxberg (2014) suggested that fun in the game environment originates from the nature of the embedded tasks which are challenging but doable.

In the game environment, players learn through play and get rewarded through digital trophies that represent a mastery of a skill. Hughes and Lacy (2016) argued that play is an appealing way to learn for several reasons. Play represents no pressure on the learners to meet a requirement or complete an assignment and is described as neither "coercive nor prescriptive" (p. 14). In many cases, learners show resistance to learning or lack of interest in the topic. Play can facilitate learning as it "lacks the bitter tinge of will-thwarting authority and thus engenders less resistance in the learner" (p. 14). Learning through play does not mean that the learners are unconsciously learning through what is called "stealth learning" (Kapp, Blair & Mesch, 2014, p. 73). They elaborated that gamification works as a catalyst to discuss key learning points which should be clearly and explicitly stated and not require the learners to struggle to figure them out.

The learners, they added, should be told about what they will be learning and should be asked about what they learned.

Gamification cannot be understood holistically without the essential components of video games that can be incorporated into learning environment. In the next section, player types and game components will be discussed.

Player Types and Gamification Features

The research about player types informs us about a proper gamified design for delivering pedagogical content. It is important to consider how the students react differently to the introduction of gamification and how their learning experience may vary. Barata, Gama, Jorge, and Gonçalves (2015) identified three types of learners in their study: the achievers, the disheartened, and the underachievers. They argued that the achievers sought to maximize their gain from participating in the gamified experience. The disheartened are the most particular student type who lost their engagement in the gamified experience and felt that they have a lot of pressure to catch up with the achievers. The underachievers are described as disinterested in the gamified course from day one.

A test called Bartle's Test of Game Psychology was developed to categorize players according to their playing styles (Bartle, 1996). The test was based on players game behavior whether it is action versus interaction and world-oriented versus player-oriented. The test was adopted, recreated, and maintained by many game-design websites, such as GameDNA, and users have taken the test more than 800 thousand times (everthing2com, 2015). Based on this test, there are four types of gamers or players:

1. Killers: those who compete and play against other gamers.

2. Achievers: those who achieve status due to a high level of performance.

3. Explorers: those who collect virtual goods and discover things.

4. Socializers: those who are good team players and collaborate with others in the game environment.

The needs of the four types of players need to be considered in an effective pedagogical gamification design (Folmar, 2015). He noted that killers rely on badges and points displayed on a leaderboard to gain public recognition in the game environment. Achievers track their achievements through badges and points and are keen to know the status of their progress. Scoializers interact with others through mutual support. Finally, explorers are independent and are more interested in pursuing a quest rather than impressing others.

Marczewski (2013) added the fifth kind of player type: the *philanthropists* who are motivated by purpose to help others. Furthemore, Kim (2010) modified Bartle's test to become pedagogically friendly. Similar to Bloom's (1956) Taxonomy, Kim (2014) changed the semantics to describe different learners and added verbs to reflect diffrerent methods of student interactions in the gamified environment. This could help in creating a pedagogical design that is adaptive to different learning styles as these verbs can be used by teachers in the creation of lesson plans and activities. Some of these verbs adapted by Kim (2014) are: build, design, customize , challenge, explore, comment, and share. The meaning embedded within these verbs is intended to facilitate learning in the gamified environment.

Kim (2014) argued that a student might exhibit multiple characteristics such as achievement and interaction. Consequently, this categorization of user types based on their motivation was loosely aligned with the learning styles of the students. However, this categorization could function as a guide in highlighting learners' motivation and creating a proper gamified design. The question here is how does this translate pragmatically for teachers in

the field? For instance, if a student exhibits high motivation, appreciates recognition for achievements, and displays altruism, then the teacher could create a gamified design allowing for these characteristics to be supported. The needs of the learners as the target group, in Kim's (2014) argument, dictates the successful gamified design.

Some researchers emphasized the importance of a game design that addresses the need of extraverts and introverts. In the gamified setting, Codish and Ravid (2014) defined extraverts as the achievers who seek hedonic values or playfulness and adopt learning styles that promote group work and interaction. Introverts, from their perspective, are the ones who prefer privacy and are more careful about making decisions in the gamified settings. If we think about these two personalities in terms of the game design, leaderboards and progress bars are more suitable to the needs of the extroverts as opposed to badges which could be assigned in a more individual level to meet the needs of the introverts. A combination of various game features may meet the needs of both extraverts and introverts (Codish & Ravid, 2014).

In the following section, some digital gamification features will be discussed including: avatars, quests and challenges, badges, points and levels.

Avatars

Avatars are representative of players in the sense that they reflect their aspirations, vulnerabilities, and the different roles they play in life. Players need to choose or create their avatars as manifestations of their autonomy needs. Avatars provide digital spaces where choice can be substantially practiced in their creation and where meaning can be realized (Wilson, 2003). Gee (2003) indicated that avatars mimic human identities such as parents, workers in different professions, religious or areligious people, and different social classes. He referred to how gaming software allows the players to design their avatars with different costumes,

powers, complexions, and in some settings, heroes or leaders as opposed to foot soldiers or workers. He added that avatar creation goes beyond segregation, racism, sexism, and many other social illnesses as it introduces virtual and fictional characters. Between the real and the avatar, lies a third *projective identity* where the real character projects its own aspirations and desires unto the virtual character (Gee, 2003). Waggoner (2009) discussed the philosophy of representation in the creation of avatars. He cited findings showing that the real-world identities "continually informed" the virtual ones (p. 1).

Wilson (2003) created an elaborate definition of an avatar as a: "Virtual, surrogate self that acts as a stand in for our real-space selves that represents the user. The cyberspace avatar functions as a locus that is multifarious and polymorphous displaced from the facility of our real-space selves" (p. 2). Avatars can also be defined as models manipulated by humans in real time (Bailenson, Yee, Blascovich, & Guadagno, 2008). Avatars represent an opportunity for players to venture into a risk-free world (Boss, 2009). The freedom to choose or design their own avatars creates an atmosphere where students can find their own voice. After choosing an avatar, the learners are faced with the next challenge: to pursue a quest.

Quests and Challenges

Quests are a series of challenges that require players to solve mystery engaging critical thinking skills (Whitton & Moseley, 2010). When students embark on a quest or accept a challenge, they engage in a story line that usually embeds a time-sensitive pattern. Quests and challenges give players a sense of direction or a purpose in a gamified environment (Zichermann & Cunningham, 2011). Adding story components or beginning a course with a form of a challenge could be more engaging than a list of course objectives; both strategies recommended and applied by gamification proponents (Sheldon, 2011; Kapp, 2012).

Employing quests in this manner "provides context or activities which are used within games and adds them to the content being taught" (Kapp, 2013, p. 126). Quests and challenges support the sense of adventure and activate critical thinking skills by setting the exploration and discovery elements (Dale, 2014; Powers, Brooks, Aldrich, Palladino & Alfieri, 2013).

There are several learning elements unique to the gamified environment as it pertains to the quest or challenge storyline (Kiang, 2014). In the virtual world of gamification, failure does not have the same negative connotations as in the real world. Consequently, the failure or death of an avatar character is a chance to contemplate, learn from mistakes, and restart again as the concept of failure is fragmented to small failed attempts. Kiang (2014) recommended a teacher providing ways for the students to fail frequently in many small ways, rather than in one big high-stakes test. In a gamified context, there is no single way to achieve success or accomplish a goal and students are empowered by this flexibility to take a personalized path to success.

Quests can offer students the opportunity to work cooperatively and develop teamwork, or they can choose to work individually where their achievements will "roll up to a group" (Zichermann & Cunningham, 2011, p. 65). This sense of unity is one of Gee's (2003) thirty-six pedagogical principles called *affinity group principle* which the gamified environment fosters. He explained: "learners constitute an 'affinity group,' that is, a group bonded primarily through shared endeavor, goals, and practices and not shared race, gender, nation, ethnicity, or culture" (p. 212).

The affinity group principle is manifested in many types of video games including massively multiplayer online games (MMOG). These games typically support hundreds or even thousands of players coming from different geographical, social, and racial backgrounds contrary to the stereotypical image of a video game player as White, reclusive teenage male

who is typically overweight (Bergstrom, Fisher, & Jenson, 2014). The power of this virtual social environment can be employed allowing for learners to interact and collaborate instead of competing against other.

As players advance in the stages of their epic quests, they start gaining badges, one of the oldest game elements used to boost motivation and engagement.

Badges

Badges have a long history in many fields outside of gamification. Antin (2012) dated the history of badges back to 1911, where the Boy Scouts of America appreciated the motivational power of goals, status, reputation, and recognition with valued accomplishments (Social Mediator, 2012). Digital badges are indicators of accomplishment, skill, quality, or interest that can be earned in various learning environments (Grant, 2013). Digital badges were defined as representations of interest and affiliation that are available online to differentiate them from badges used outside of the world of gamification (Gibson & Jakl, 2015). In the context of education, badges are chosen in a gamified environment to accommodate different learners considering their motivation levels and capabilities (Abramovich, Schunn, & Higashi, 2013). As students advance through different levels and accumulate badges associated with different achievements, badges then serve as an online record of a learner's achievement (Devedžić & Jovanović, 2015).

According to Nicholson (2015), players who earned badges feel a sense of accomplishment as their status is announced publicly in the gamified environment. He added that badges not only serve as signposts signaling the players progress, but also indications of past achievements. Richter, Raban and Rafaeli (2015) argued that badges serve as a record of an individual's past and present successes. On a social level, badges establish the reputation of

an individual in the game environment and enhance qualities such as self-competence and self-efficacy. There is a strong connection between badges and engagement as studies have shown participants receiving badges spend more time on task (Gibson & Jakl, 2015).

The use of digital badges allows the educator to reward learners on their progress and achievement on a granular level. In other words, one of the affordances of digital badges is rewarding the mastery of a skill or an achievement on a micro level where the learners get instant feedback on their progress regardless of how small it is. Another way to describe this is "microcredentiality" where a learner gets credit for signs of improvement on smaller tasks (Bull, 2016, p. 2).

Not only do badges represent learners' achievement, but also points and levels are important signs of their progress.

Points and levels

Points have a significant place in a gamified environment. Some game proponents consider points as an essential part of any gamified design (Zichermann & Cunningham, 2011). Carr-Chillman (2015) emphasized the essentiality of having points in the gamified design to add engagement to ordinary tasks. Attali and Arieli-Attali (2015) used points as the main gamification component that they included in their study of performance measuring fluency and understanding of math concepts. Gamification opponent Bogost (2011), critiqued the dependency on and exclusiveness of many gamified designs to points, which he thought were the least significant part of video games.

Contrary to Zichermann and Cunningham's (2011) argument, rewards are not necessarily permanent. They could reinforce desirable learning behaviors and once these learning behaviors are established, rewards have no purpose. They have little effect on highly

motivated learners and sometimes that effect could be negative. Nicholson (2015) supported this argument stating that rewards could encourage certain learning skills if used with particular types of learners. Once these skilled are mastered, rewards need to be removed. He elaborated further on the idea that points and badges do not work with everyone, certainly not for ones with strong intrinsic motivation.

Extrinsic rewards undermine intrinsic motivation based on the cognitive evaluation theory which Deci and Ryan developed in 1985. Research showed that tangible rewards have a significant negative effect on the participants' intrinsic motivation (Deci, Koestner, and Ryan, 2001). In the gamified setting, virtual badges are designed to mark progress and enhance achievement and are rarely considered tangible or replaced with monetary rewards. Gafni, Geri, and Bengov (2014) conducted a study on the effect of tangible and virtual rewards and concluded that virtual rewards have a stronger effect on the participants' interest to acknowledge the content. Their research showed that the interest in the value of the knowledge increased following the use of virtual rewards as compared to tangible rewards.

Hanus and Fox (2014) adopted Deci et al.'s argument and created a hypothesis that badges and points, which they considered as extrinsic rewards, will have a negative effect on the intrinsic motivation of the students. Their study concluded that students who were awarded rewards were less intrinsically motivated and performed less in terms of their scores compared to the control group who never experienced the reward system. Despite the results of their study in terms of the effect of rewards on intrinsic motivation, they highly recommended researching the game elements so that the most effective components can be parsed out.

Modern games usually have scaffolding techniques where players are introduced to simple levels to start with to encourage their progress. The players cannot advance to the next

level until they have achieved mastery in the previous level (Kiang, 2014; Kolb, 2015). Prensky (2001) argued that players, without making a distinction between types pf motivation, need frequent rewards not penalties to signal skill mastery. According to Zichermann and Cunningham (2011), we should not wait for the birth of intrinsic motivation. By creating conditions which are extrinsically motivating, we shift the focus of responsibility from hoping it happens to a structure and process for making it happen. According to Hanus and Fox (2015), the groups of students who seemed to be most engaged in a gamified classroom environment were low achievers or learners with weak intrinsic motivation.

Gamification in Action

It is useful in the study of the effect of gamification on motivation and engagement to consider some practical examples of the gamification application. Some researchers studied the use of gamification in the college ennvironment (e.g. Sheldon, 2011), while others researched gamification in middle and high school environment (e.g. McGonical (2011).

Sheldon (2011) gamified a college course about game design by assigning points to reward the students' academic work and allowing them to advance in game levels as they accumulated enough points. He considered his experiment as successful in promoting students' engagment and improving their retension but with modest changes in overall performance. His design focused on the non-digital aspects of gamification where individual points carried less importance than scores assigning hundreds of points total for the gamified activities he created. The Kolb (2015) suggested that teachers engaging gamification points should be generous in using them where 100 points is no longer the equivalent of grade (A).

Sheldon (2011) tried to foster intrinsic motivation by incorporating gamification elements other than points and levels which are symbols of extrinsic motivation. He established guilds

where students could collaborate and manifest altruism in helping "guild mates" (p. 119). He expanded the concept of rewards to include knowledge and practice which he subsequently called "intrinsic rewards" (p. 166).

The gamified design Sheldon (2011) created was critiqued by Stott and Neustaedter (2013) for superficial implementation of gamification by simply renaming course assignments using gaming terminology. They were concerned that Sheldon (2011) overly focused on points and levels in his experiment. Some researchers posited that going beyond surface characteristics of gamification, in reference to points and levels, is essential in the game design (Lawley, 2012; Bogost, 2010). Lawley (2012) advocated creating an interactive game design which is aligned with pedagocial principles and conductive to collaboration. She added that a faulty or superficial gamified design can damage existing interest or engagement.

Amother example of gamification in action is the Quest to Learn school, which was established in June of 2008 and funded by MacArthur and the Bill and Melinda Gates foundations. This New York-based school adopted gamification and game-based learning throughout its entire curriculum from grades six to twelve. As a result of collaboration between game designers from the Institute of Play (2007) and educators, this school was established to function as a model for other schools around the world. McGonical (2011) noted that students are engaged in gameful activities from the moment they wake up to the moment they finish up their final homework assignment at night.

O'Keefe (2012) explained how the curriculum is designed as a result of coordination between the teachers and the game designers based on the needs of the students. The school assignments are far from traditional and involve students facing different challenges and engaging in quests that start before the beginning of a school day. The creators of Quest to

Learn commented on their mission: "Each trimester students encounter a series of increasingly complex, narrative challenges, games or quests, where learning, knowledge sharing, feedback, reflection and next steps emerge as a natural function of play" (Quest to Learn, 2008, p. 1). Craven (2015) emphasized the nature of gamification as an immersive experience which creates engagement for the user. This implies approaching the implementation of gamification holistically in a manner that incorporates effective elements such as quests and challenges. Reiners and Wood (2015) connected the immersive experience to story-telling elements in gamification where the virtual environment for visualization is activated.

There has been no independent evaluation of the Quest to Learn experience in terms of the principles and strategies inspired by gamification. The only accounts provided are what the founders of the pioneer school and the proponents of gamification provide. Consequently, a full evaluation of the Quest to Learn gamified experiment is not possible at the moment. Quest to Learn is a privately-funded school which would raise criticism in regards to the donors' vested interest. The New York City (NYC) Department of Education survey (2015-2016) shared parents, teachers, and students' responses in different areas related to Quest to Learn compared to New York City middle and high school percentage of positive responses. The survey was not directly related to the gamified strategies Quest to Learn has adopted but more focused on the overall school evaluation compared to NYC average. It showed that Quest to Learn was below the city average in most areas such as rigorous and supportive school environment. However, when the students were asked to rate their learning experience, the positive response was higher compared to NYC average (Education, 2015-2016).

The examples of Sheldon's case study and Quest to Learn could help in creationg implementation guidelines for any gamified model. In the next section, some of the guidelines for implementing gamification will be discussed.

Implementation Guidelines

The implemenation of gamification in a pedagogical context requires careful consideration and logical justification. Incorporating video game elements into learning because they are fun, easy to design, popular, or to facilitate effortless or stealth learning are all wrong reasons to do so (Kapp, Lucas & Mesch, 2014). The reasons mentioned above for setting up gamification may be afforded through the gamified environment but should not be the chief reasons for educators to adopt the gamification approach into learning and teaching. This mandates that a list of pedagogically acceptable reasons be presented prior to engaging the gamified design. Creating interaction and interconnectivity among the learners, enhancing engagment and motivation, supporting critical thinking skills, positive change of behavior, and providing opportunities for authentic activities are all among the right reasons for employing gamification, according to experts (Kapp, Lucas & Mesch, 2014). Stork (2015), along with Kapp (2014), highlighted the high interactivity level that gamification affords in the learning environment. They both argued that students learn valuable communication, collaboration, critical thinking, and creativity skills through the use of gamification.

In traditional instructional methods, students may earn grades based on a performance of a task as they demonstrate achievement, whereas in gamification the effort is rewarded with badges or points even when the objective is not completed. In other words, in a gamified environment the students are encouraged to engage in the process and reasoning and are evaluated accordingly regardless of whether they succeeded in their endeavor or not. Of course,

this is not to undermine the importance of tasks but rather to motivate the learners to exert effort in tackling different learning challenges. Gamification has been found to increase task completion as indicated by Brewer et al.'s (2013) study on children (five to seven) showing an increase in the percentage of task completion of mobile computer applications from 73% to 97%. Another study by Armier, Shepherd and Strabut (2016) yielded significant results of the effect of video game elements on the time preservice teachers spent on task and the percentage of task completion of technology integrated course assignments.

Some proponents of gamification suggested using 20% of class time for gamification following McLaughlin's (2011) Google model where employees were given 20% of work time to do anything they were passionate about (Bruder, 2015). It is important to understand that McLaughlin is a Google certified teacher, so his allocation of 20% of class time to gamification use could be described as biased. The needs of the learners and educators dictate the extent of gamification implementation in a pedagogical context. Consequently, no fixed percentage of gamification use could be enforced regardless of the context and pedagogical considerations.

There is a need to identify distinctive characteristics of good games where their pedagocial use is logically justified (Simões et al., 2013). The principles to incorporate in gaming are intended to be "equally relevant to learning in video games and learning in content areas in classrooms" (Gee, 2003, p. 41). Geelan et al. (2015) conducted a case study which showed the most effective game elements in an educational setting as the ones which meet the learners' need for self-efficacy and autonomy such as immediate feedback and progress bars.

In the context of discussing the effective use of gamification in the learning environment, Kennedy and Allen (2017) emphasized the importance of having clear objectives to gain the appreciation of the participants. Kolb (2015) outlined four principles necessary in

any successful pedagogical gamified design. First, she recommended that the learning objectives be well-stated and explicitly-presented prior to engaging gamification elements, and preferably embedded within the gamified design. Second, she highlighted considering practical steps when applying gamification design in the learning environment, such as the use of reliable gamification software making the full employment of gamification features possible. Third, game designers and educators, according to Kolb (2015), need to prepare quests to increase motivation and engagement. Fourth, the gamified design should allow for modding (shortened from modification). Modding, in a gamified context, means to allow users to make their own game choices. Students need to be empowered to choose their own avatars, create quests, and decide to engage the gamified content individually or by working in teams.

Research has shown that intrinsically motivated students experience gradual disengagement and loss of motivation when forced to use game features (Hanus & Fox, 2015). Gisbson and Jakl (2015) connected choice in the gamified experience to the autonomy of self-directed learning. Autonomy as one of the three principles of self-determination theory (SDT) is connected to intrinsic motivation (Nicholson, 2015). He added that allowing the learner to make choices in the gamified experience will create an atmosphere for meaningful gamification to happen.

Successful game design should facilitate collaboration and team work through the use of leaderboards or *guilds* (Gee, 2003). Zhang and Clear (2015) added that successful gamified designs which incorporate collaboration help the emerging of positive learning behaviors. Kim, Glassman, and Williams (2015) stated that as the players collaborate, they engage in a shared, relevant, and goal-oriented activity.

Another important consideration in creating an effective gamified design in the learning environmnet is empowering the players to try multiple times to achieve success. In the gamified environment, failure is redefined so that it is no longer a setback but rather an opportunity to learn from mistakes and correct them (Hanus & Fox, 2015). Research showed that players who received constructive feedback following failure in the gamified environmnet expressed positive emotions about their experience (Herzig , Ameling, Wolf & Schill, 2015). Gee (2014) considered failure in the gamified world as a path to success.

Understanding the full potential of gamification in education necessitates studying the utilization of game features over a longer period (Attali & Arieli-Attali, 2015; Hanus & Fox, 2015; González et al., 2016). Employing limited game features in isolation to an existing course may not produce desirable or measurable effect (Whitton & Moseley, 2010). The limited use of gamification in the form of employing some features of games into the learning experience produced mixed or adverse results on performance and motivation (Attali & Arieli-Attali, 2015).

Some researchers who engaged learners with limited game features reported participants asking for more elements of gamification (Papastergiou, 2009). There is strong evidence to suggest a direct link between the effective use of gamification elements and meeting basic psychological human needs connected to self-determination theory. Francisco-Aparicio et al. (2013) highlighted the importance of a gamification design that meets the inner psychological needs of the learners intersecting with principles of self-determination theory of relatedness, competence, and automomy. For example, relatedness, according to Francisco-Aparicio et al. (2013), could be supported through online interaction and collaboration. Competence needs, in their view, can be maintained through group practice activities. They

posited that offering learners choices and allowing them to take control in the gamified environment fulfills their autonomy needs.

Many teachers, as Gee (2003) suggested, are gamers themselves, yet they are often reluctant to use methods not directly related to their professional practice. Many teachers have no difficulty introducing game elements into the classroom with the help of supporting and useful software such as Classcraft, for example. Watching the software tutorials and experimenting with it is not beyond the skills and abilities of many teachers. Lee and Hammer (2011) argued that gamification can give teachers the necessary tools to direct and motivate their students, thus, transforming the learning experience into a joyful one, particularly for leanrers who are intrinsically unmotivated. This is not to state that learning is merely about joy, but it could help in creating a relaxed atmosphere that is conductive to learning (Prensky, 2001).

In summary, this chapter first introduced Kapp's (2012) definition of gamification as an emerging field in education and highlighted the scarcity of research on the effect of gamification use on motivation and engagement. The review of literature also included different definitions of gamification, description of theories which can be linked to the study of gamification, and comparison of gamification to game-based learning. The literature review covered the connections between gamification, motivation, and engagement in addition to gamification affordances (e.g. fun), features, player types, and finally some examples of gamified projects and implementation guidelines.

Between zealots who support full gamification of the curriculum in the educational system to opponents who think gamification is a distraction from the learning objectives, there remains a need for further exploration of the full impact of gamification on engagement and

motivation. Further empirical research needs to be conducted to examine the potential of gamification. In addition to deploying full gamification features to study its impact, longitudinal studies need to be conducted in order to develop a full understanding of the effect of gamification on the learners' engagement and motivation. Equally important is the need to research the most effective game components in supporting motivation and engagement.

The aim of this research investigation is to identify gaps in literature on the study of gamification, particularly its effect on motivation and engagement in the college environment. I hope that this research will serve to broaden the current understandings of the use of gamification as a pedagogical tool to promote learning, motivation, and engagement.

CHAPTER THREE

METHODOLOGY

This chapter addresses (a) the selection and rationale for a mixed-methods design in researching gamification, (b) the research sites, participants, and types of subject samples, (c) qualitative and quantitative data sources, (d) the analytic strategy, (e) ethical considerations and (f) limitations.

Gamification has been researched mostly using quantitative design; few studies have adopted mixed-methods approach. The studies described as mixed-methods are dominated by quantitative elements with limited qualitative components such as observations and/or interviews. In this research, a mixed-methods design was adopted to study the effects of gamification on student motivation and engagement specifically, a convergent mixed-methods design involving the separate collection and analysis of qualitative and quantitative data (Creswell, 2015).

Mixed-methods Design

It was essential to select an appropriate design, one that facilitated the investigation of learners' perceptions and experiences. In a mixed-methods design, the researcher combines the strength of both qualitative and quantitative data to achieve a better understanding of the research phenomenon (Creswell, 2015). Wolfson (1986) and Halcomb, Andrew and Brannen (2009) were among many in support of this dual data collection approach to interpretation and analysis for thorough attention to the different aspects of Social Science phenomenon under investigation.

Mixed-methods design strengthens triangulation which helps to ensure accurate and valid data interpretations (Bryman, 2004; Rocco et al, 2003; Sreejesh & Mohapatra, 2014).

Another argument in support of this approach is rigor where the weakness of one data collection method is balanced by the strength of the other method in an interdependent manner (Clark & Ivankova, 2016; Hollstein, 2014). Four additional advantages were noted by Johnson and Onwuegbuzie (2004): (1) capacity for more extensive scope of inquiries, (2) more thoroughly grounded findings, (3) capture of knowledge and understanding that may be missed in a solitary technique, (4) facilitation of a thorough understanding of the research problem whether theoretical or practical.

Convergent Mixed-Methods Design

Convergent, mostly known as concurrent or parallel, mixed-methods design is founded on sequential collection of qualitative and quantitative data (Creswell, 2015). Convergent mixed-methods design was used for this current study by independently collecting and interpreting the qualitative then the quantitative data related to the effect of gamification on student engagement and motivation, then merging the data types arrayed side by side. The process made clear the extent to which one set of data confirmed the other. Creswell (2014) has argued that merging or converging data contributes to holistic understanding of the research phenomenon. The data for this convergent design was collected roughly at the same time, analyzed separately, and the results merged or integrated (Figure 1). The goal was to use divergent or disparate preliminary interpretations based on each data type for the development of a holistic, overall findings (Hesse-Biber, 2010)

The same design has been also called the *parallel* approach by Teddlie and Tashokkori (2010) because quantitative and qualitative data are collected and analyzed separately in a parallel manner then converged in the interpretation stage, also called the *interface* stage (Bian, 2015; Clark and Ivankova, 2016; Hollstein, 2014).

In this dissertation, mixed-methods convergent design was used to improve upon previous studies based on questionnaires and student scores or points and other metrics. Seaborn and Fels (2015) reviewed empirical studies between 2009 and 2015 reporting that of fifty-six studies conducted, two used qualitative designs, ten used mixed-methods designs, and forty-four quantitative-design studies (Figure 2). Not only were there few qualitative studies but also most of the mixed-methods studies (about 16% as in Figure 2) used predominantly quantitative data and marginalized qualitative elements such as observations and interviews (See also Hamari, Koivisto, & Sarsa, 2015). Using qualitative data sources to support the interpretive process of meaning-making was rare (Patton, 2015; Stake, 2010).
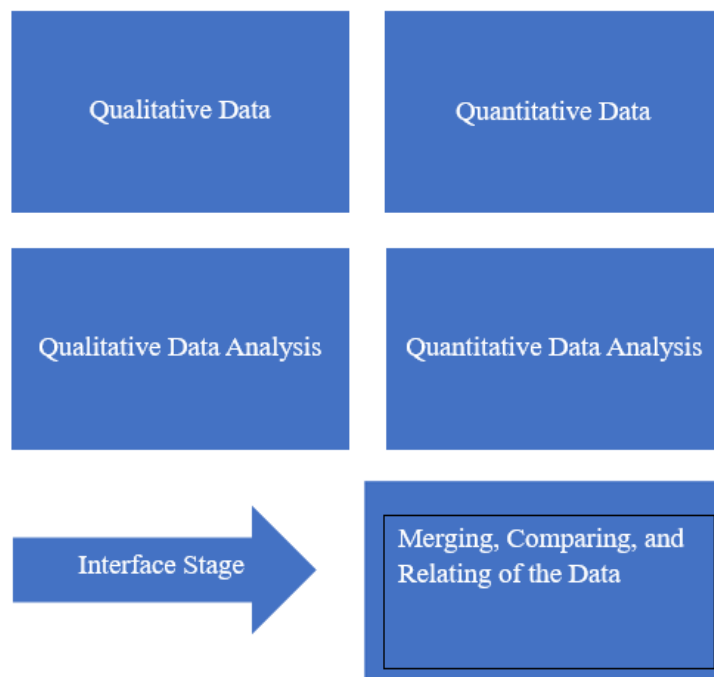
Figure 1. An outline illustrating convergent mixed-methods design.

The scope of what can be learned about the effect of gamification on motivation and engagement could be greatly expanded with a mixed-methods design featuring balanced qualitative and quantitative elements, enhancing the comprehensiveness of the study. General

recognition of the importance of mixed-methods was suggested by its use between 2015 to

2017 when many researchers adopted mixed-methods for understanding gamification (e.g.

Çakıroğlu, Başıbüyük, Güler, Atabay, & Memiş, 2017; da Rocha Seixas, Gomes, & de Melo

Filho, 2016; Kuo & Chuang, 2016; Scheiner, 2015).
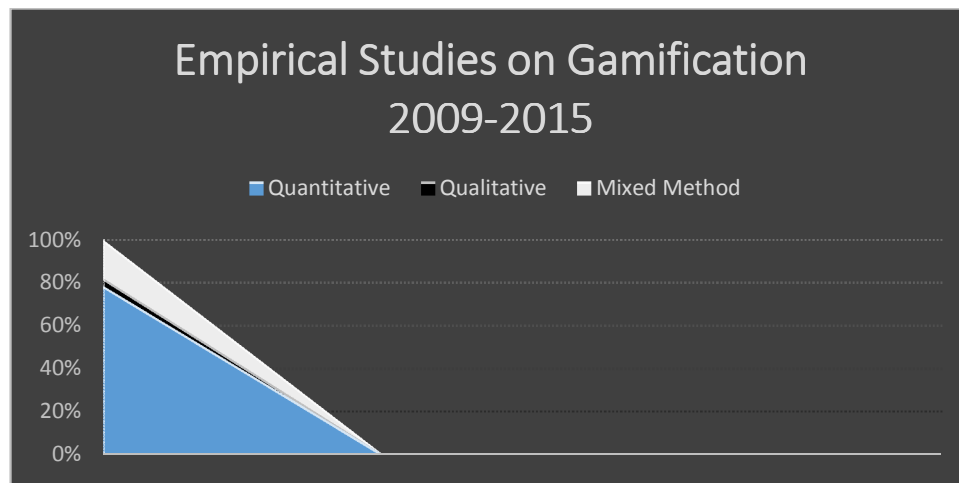
Figure 2. Percentage of different research designs within 16 years.

There are three essential difficulties confronted by the researcher utilizing a mixed-

methods approach. First, the requirement for data collection is broad and resource-consuming

since both quantitative and qualitative information are required. Second, mixed-methods

research is an exceptionally time-concentrated approach involving gathering and reporting in

both content-oriented and numeric ways followed by analyzing and overall merging of the data.

Third, the researcher must be familiar with both quantitative and qualitative forms of research,

expanding training needs.

Teddlie and Tashakkori (2009) have posited that the priority in the mixed-methods design

study cannot be decided prior to conducting data collection. It is only, they argued, after the

research process has started that relative methodological contributions may become apparent.

The qualitative and quantitative data play significant roles in answering the research question

about the effect of gamification on learners' motivation and engagement. Consequently, making the decision of what goes first in the concurrent mixed-methods design requires logical justification. Some researchers who followed the protocols of this design started with the quantitative components and used qualitative research to add more depth and navigate vertically into qualitative data sources to fully understand the research problem (e.g. Buck et al., 2009). Other researchers decided to prioritize qualitative research and created their hypotheses for further quantitative analyses based on findings they attained using interviews and observations (e.g. Ruffin et al., 2009).

The qualitative components in the mixed-methods design adopted in this particular study prioritized qualitative elements, while quantitative data sources were collected earlier but most fully used subsequently.

Research Sites

Three Washington State University (WSU) courses were selected for this study varying in terms of their content, student age, background, instructor familiarity with technology, and their incorporation of gamification elements (Table 3). Site contrasts contributed to overall understanding of the phenomenon by expanding beyond a single implementation of gamification. Variations in instructors' experience and background on the implementation of gamification allowed for the investigation of different elements and parameters in different contexts.

Writing and Research Honors with its focus on English rhetoric and cultural and racial representation was the first course at the Washington State University Pullman campus selected in this study. Dr. Edwards (a pseudonym) was the instructor of this course and has multiple research and teaching interests, especially in rhetoric and racism. Dr. Edwards adopted avatars

Table 3
Sites Background

	Spring 2017	Spring 2017	Summer 2017
Date			
Site Information	ENGL 298	TCH LRN 518	ENGL 402
Location	Pullman Campus	Tri-Cities Campus	Pullman Campus
Semester	Spring 2017	Spring 2017	Summer 2017
Students	13	6	25
Gamified Content	Assignments, Exam, Avatars, Quests.	Assignments, Points, Quests, Avatars.	Badges, Points, Quests, Avatars
Software Used	ClassCraft	ClassCraft, Gamestar Mechanic	ClassCraft
Data Collection Methods	Interviews, Observations, Survey, Game Metrics	Interviews, Observations, Survey, Game Metrics, Points	Interviews, Observations, Survey, Game Metrics, Points

and quests in his syllabus and was less keen on incorporating points which he considered symbols of Western capitalism (See Bogost, 2010). The class was offered during the Spring of 2017 with a class of thirteen students.

The second course also selected at the Pullman WSU campus was Technical and Professional Writing, which focused on teaching communication writing skills in technical English. Dr. Peterson (a pseudonym) is interested in teaching literary essay, journalism, and fiction. He was less resistant than Dr. Edwards in embracing video game features but still cautious about using points. His course was similar to Dr. Edwards' in terms of the content, English writing, but with more focus on the use of technical English for communication and journalism. The course, a prerequisite for undergraduate freshmen, was designed, according to the professor, to strengthen students' understanding and mastery of language in the context of technical and professional writing with audience and purpose in mind. Some of the gamified

assignments in the course allowed the students to create their own gamified content and write about the steps and challenges in technical English. The class was offered during the Summer of 2017 with a full class of twenty-five students.

The third course, Integrating Technology into the Curriculum, was located on WSU TriCities campus. This course is designed to introduce students to the educational uses of a wide range of digital technologies. Dr. Jones (a pseudonym), who specializes in curriculum development and instruction in addition to science education, was the most welcoming to the use of gamification. The content of the course, as the name suggests, was on incorporating technology into the curricula for pedagogical purposes. Based on the objectives in the syllabus (Appendix A), the students were required to understand the concept of educational technology, analyze websites, create a digital lesson, and, among other things, create an online representation of themselves. The content and goals of the course were adaptable to gamification design. These variations added comprehensiveness to data analysis.

Participants

There were 47 participants including 44 students and three instructors. Three instructors and twelve students (four from each course) comprised the primary subjects. Interviews were conducted with all of them.

Types of Subject Samples

A purposeful sampling strategy, a range sample, was used to identify students as primary subjects. The students were selected after consultation with the three instructors based on their performance in class and how engaged and motivated they were. Consequently, some students selected for the interviews were visibly disengaged and uninterested in the gamified events while others showed signs of engagement and increased motivation. The goal was to

obtain opposing points of views, when possible, to the activities where gamification was utilized.

Early observations of the students in the three classes helped determine the samples. The four students interviewed in the English 298 Writing and Research Honors were all undergraduate freshmen majoring in pharmaceutical studies, political science, agricultural biotechnology, and pre-veterinary medicine. Students interviewed in the English 402 Professional and Technical Writing were sophomores majoring in chemical, electrical, computer engineering and astrophysics. The in-service teachers selected for interviews in the TCH LRN 518: Integrating Technology into the Curriculum had science, history, English, and physics backgrounds.

In addition to these twelve students from the three classes, the sample of the instructors as primary subjects was based on their use of gamification in teaching and on their willingness to participate. Dr. Edwards' experimentation with gamification in the semester previous to data collection made him a good candidate. Dr. Peterson, although he had used badges on limited scale in his prior teaching, showed open-mindedness and willingness to be a primary subject. Dr. Jones' enthusiasm and support of the use of gamification in addition to his experience using gamification added significance to selecting him for interviewing.

English 298: Writing and Research Honors, Pullman Campus

A prerequisite for this undergraduate course required that all students interested in enrolling must be honor students with outstanding academic performance. The course was designed to promote critical thinking, research, and advanced writing skills. The main content of the course was writing about multi-cultural and multi-racial topics.

Dr. Edwards had re-designed the course based on his first exposure to gamification during the previous semester. Since the course focused on research and writing on multi-cultural and multi-racial topics, avatar creation had been selected as one of the main assignments. The professor asked the students to create avatars representing various ethnic and cultural backgrounds and to write about the politics of beauty and representation. All writing assignments were changed into quests, and the students completed missions to collect information and to report their findings to the class. Gamified cultural simulations were incorporated, mimicking real-life political negotiations.

Concept checking quizzes were created in the form of Boss battles using ClassCraft, a gamification platform. The Boss was an imaginary virtual beast which Dr. Edwards continuously referred to as symbolizing racism, colonialism, and other forms of injustices. Students collaborated in teams to answer questions, battling against the Boss who lost life points every time students answered correctly. The classroom environment was immersive with intense music playing in the background.

Dr. Edwards, the professor who had been teaching this course for some time, focused on rhetoric and racism. His teaching style was mostly student-centered and discussion-oriented. Briefly exposed to gamification in a departmental meeting, his knowledge of gamification expanded during the work with me on a pilot study the previous semester. Dr. Edwards described himself as neither a technology enthusiast nor opponent. He favored some game mechanics, such as quests and avatars, over badges and points system.

The students enrolled in Honors Writing were all freshmen honor students, their ages ranging between 18-21years. Dr. Edwards obtained background information about each student prior to the course so he could create a course design based on their needs. The majority of the

students came from upper-middle class families with gross annual income of more than $250,000 a year; only two of the students came from low-income families and were on university scholarships. There were thirteen students total coming from science majors such as pre-medicine, pre-pharmacy, and political science. The majority of the students (eleven female and two male) were White except for two Asian American students.

Background of the TCH LRN 518 Professor and Students

TCH LRN 518 was one of the required courses for the Master of Teaching in the certification program. The course goal listed in the syllabus, was to expose in-service teachers to a wide range of digital technology designed for pedagogical use. The course was designed not only to equip the teachers with the knowledge and skills to use in their own teaching practice but also to create a digital representation of themselves. The in-service teachers were required to evaluate and analyze different sources of digital and educational technologies.

Dr. Jones, the professor, taught the course with a research interest focused on Science, Technology, Engineering, and Mathematics (STEM) schools, neurocognition and learning in education, and the impact of Virtual Reality (VR) and Augmented Reality (AR) on education and learning. Dr. Jones had used instructional technology in his previous and was committed to using gamification in his TCH LRN 518 class. He had purchased the advanced version of ClassCraft and decided to use the gamified platform as a base for all his course activities incorporating many game mechanics such as avatars, quests, points, badges, and leaderboards. He replaced the letter grade system with a scale of 600 points, which he awarded for different course assignments. He adopted the use of video game elements into all aspects of his course showing no preference of one component over the other.

There were six students in Dr. Jones's class, in the College of Education ranging in age between 25-55 years old. All of them worked full time as teachers in elementary and middle schools teaching different topics related to math, science, and history. All six students were White, two female and four male. There was no information available regarding their income, but they all seemed interested in advancing their careers and increasing their incomes by enrolling in graduate school.

During the introductory part of the course, the students described themselves as having weak foundations in using instructional technology and hoped the course content would help them strengthen their knowledge and skills. A unique aspect to this course, making it different from the two courses on the Pullman campus, was the congruence between content and pedagogy, the course having been designed to aid teachers to advance their teaching methods. Another distinguishing element in the course was that the reading assignments were well-connected to gamification and augmented reality; Dr. Jones assigned two young adult novels: *Ready Player 1* (Cline, 2011) on gamification and *Rainbows End* (Vinge, 2006) on augmented reality.

Background of the English 402 Professor and Students

Dr. Peterson, the professor, taught writing and literature, including professional writing and editing, environmental writing and literature, literature of literary journalism and the American West. He incorporated, among other gamification components, points, badges, avatars, and quests.

All the students enrolled were undergraduates. The majority of the students' ages fell between 19-23 years, of the twenty-five students, six were female and nineteen male. Many were minority and international students: ten engineering students of Middle-Eastern origin,

eight Asian students with different majors, one African American student majoring in English literature, and six White students from different colleges. All of the international students were on scholarships from their countries of origin, and the American students supported themselves through financial aid, grants, and family contributions. There was no information of their families' gross incomes.

Data Collection: Qualitative

Observations

Observations were selected for data collection to record visible signs of student engagement to triangulate with the students' opinions of the gamified intervention. The total number of observations was fifty-eight (thirty in English 298, twelve in TCH LRN 518, and sixteen in English 402). The observation narratives were handwritten and simultaneously audio-recorded, then typed into word documents. Observations narratives were not validated due to the possibility of introducing observer effects.

Observations focused on (a) whether the students seemed motivated and/or engaged or not, (b) which video game elements, if any, motivated and engaged the students the most, (c) moments when the gamified strategies were used in the classroom and how effective they were. The target data was students' task engagement, their methods of participation, time on task, interactions among the students, what students did in response to the gamification intervention, which gamification strategies worked effectively, and which did not, whether elements of video games were mistakes in the design and which ones were missed opportunities.

The observations occurred during the class sessions at the WSU Pullman and Tri-Cities campuses three times a week for the English 298: Writing and Research Honors, and once a week for the TCH LRN 518 class. The ENGL 402 class was observed four times a week due to

the compacted course material covered during the summer session of 2017. Course observations were completed in person in both the Pullman and Tri-Cities campuses.

The procedures used to analyze the observations were based on grounded theory. The use of grounded theory involves the creation of themes and categories through using an inductive process (Glaser & Strauss, 1967). Experiential observation narratives recorded a description of students' experiences not based on observation protocols. All the notes from the observations and the script from the interviews were examined and descriptive methods were used to connect themes. The goal of these observations was to record how the students perceived the gamified interventions in their perspective classes and whether this affected their motivation and engagement.

Interviews

Interviews were designed to collect important data on the students' perceptions of the gamified events they participated in, their opinions of the effectiveness of the gamification implementation and ways to improve it. Students were selected for interviews based on observations and in coordination with instructors to include not only those interested in the gamified activities, but the students who were less engaged or critical of gamification. This was an endeavor to catch the various opinions on the utilization of video game elements in these courses. Since the interviews were semi-structured, questions were modified occasionally, and sometimes new questions emerged based on the conversation with the students. Unexpected answers led to further discussion adding more depth to the data collected through this source.

A total of twelve students were individually interviewed (eight students in Pullman and four in Tri-Cities campus) for approximately forty-five minutes each. Face-to-face semi-structured interviews were conducted in English 298 and English 402, and Skype and/or

Google Hangouts were used to interview students in TCH LRN 518. Semi-structured interviews allowed the flexibility to change the questions order on the interview protocols and to ask further questions based on significant replies (Bryman, 2012).

Students were interviewed once at the end of the semester to determine whether and to what extent the gamification they experienced motivated and engaged them. The interviews highlighted those aspects of gamification that were most/least engaging and indicate which gamification elements motivated them the most/least. The student interview protocols listed ten semi-structured questions (Appendix B).

All three professors were individually interviewed. Two of them were interviewed twice, at the beginning and at the end of the semester. These interviews contributed in understanding the levels of engagement and motivation the students exhibited following the gamification intervention as their instructors perceived them. Interviewing the professors also contributed to a holistic understanding of the effect of gamification on students' engagement and motivation. Dr. Peterson and Dr. Jones were interviewed face-to-face for about sixty minutes each in the middle and at the end of the semester. Dr. Edwards was interviewed face-to-face once at the end of the semester for the same length of time. The interview protocols were semi-structured and listed four to five questions (Appendix C). The interviews were transcribed, and the transcripts were given to each interviewee requesting addition or corrections that might improve the accuracy of the data set contributing in comprehensive validation (Mabry, 2008).

During the interviews, ClassCraft game analytics were shared with students and instructors reflecting the progress and points students had accumulated or lost as they were engaged in the gamified process. The students were asked about their perceptions of their

performances as recorded by game analytics and whether they accurately reflected their

motivation and engagement in the gamified activities. Instructors were asked to give their

opinions as to whether the game analytics confirmed or conflicted with their views of their

students' motivation, engagement, and overall performance.

Artifacts and Documents

Copies of students' writing assignments, game analytics provided through ClassCraft

software, gamified quests, printouts of students' avatars, course syllabi, exam handouts, graded

writing assignments, and instructors' feedback notes on students' writing were obtained to help

determine the effect of gamification on students' motivation and engagement. The artifactual

data also included gamified projects in-service teachers created in Dr. Jones's class. These were

digital software copies of the gamified projects the teachers created under different themes.

Data Collection: Quantitative

Survey

According to Creswell (2014), surveys can provide useful numeric data on the attitudes,

habits, and points of view of a population through its sample. A survey was conducted with all

students in the three participating WSU classes asking students to rate the degree to which

different gamified activities had engaged and motivated them. The survey had a Likert scale

items with 5-point measurement scale (Appendix D) and was slightly modified to fit the three

different gamified course contents. For example, In Dr. Edwards' class where students had an

avatar writing assignment, there was one additional question of whether the use of gamification

improved their writing skills. The in-service teachers in Dr. Jones's class were asked whether

the gamified events they participated in could be used in their own teaching. Finally, students

in Dr. Peterson's class were asked if the use of game quizzes improved the quality and quantity of their reading skill.

Instrumentation used was through the development of surveys and field-testing of draft questionnaire. For example, during the first gamified events students participated in, a draft questionnaire was passed on to the students to test the comprehensiveness of the questions and their relevancy. Questions which needed explanation or created confusion among the students were eliminated or modified.

The surveys were administered and collected in person by the researcher in the three participating courses. The response rate was high in terms of the number of students completing the surveys with low missing responses due to students' absence.

Quantitative Documents: Game Metrics

In the three research sites, ClassCraft gaming was used as a digital platform allowing for the incorporation of video game elements. ClassCraft provided game metrics and analytics for all participants including the experience points (XP) the students acquired during their progress. There were forty-four game metrics showing reports of each student's performance in terms of the experience points accumulated and the health points lost. The game analytics, as made available on ClassCraft, measured the points the students gained each week in the semester in the form of a statistical chart (Appendix E). The game metrics were used during interviews to get the perception of the students about their performance. For example, every student interviewed was asked a question of whether his/her game-metrics report reflected their state of engagement and motivation or was it attributed to other reasons. The game metrics summary was presented in the form of a ClassCraft leaderboard (Appendix F). These

quantitative data points were intended to strengthen the quantitative part of the mixed-methods design.

Data Analysis: Merging Data Types

The qualitative part of the mixed-methods design in this study is based on grounded theory's constant-comparative method of data analysis (Glaser & Strauss 1967), an ongoing iterative process of collecting and analyzing data leading to theory development. However, the analyses of interviews, observations, documents in this study did not produce theory but rather led to site specific interpretations or petite generalizations (Erickson, 1986).

Quantitative data from the survey regarding students' perceptions was subjected to multiple regression analysis, then considered side by side with qualitative components in a convergent manner (Creswell, 2014) along with those game metrics deemed relevant. The integrative results culminated in five main findings which concluded chapter four.

Analysis of quantitative and qualitative data sources followed the process associated with concurrent mixed-methods design by merging data during analysis. Preliminary statistical results of relationships or associations among gamification features and affordances, on one hand, and motivation and engagement, on the other hand, were merged with a content analysis that identified emergent themes and subthemes.

Qualitative data explained quantitative correlations to develop understandings regarding convergence and contradictions in the complex data set. Statistical results explained by the qualitative analysis were sometimes unexplainable otherwise. For example, avatars had a significant relationship with both motivation and engagement. However, the standard coefficients showed avatars positively influenced motivation while they worked in the opposite direction on students' engagement. This apparent contradiction could only be explained

through qualitative data sources such as observations and interviews to understand the contextual circumstances which led to this disparate finding.

Theoretical connections to data analysis played significant roles in leading the investigation on the study of the effect of gamification on motivation and engagement. Some propositions were refuted based on quantitative or qualitative analyses, while others were confirmed, leading to the construction of findings. The findings of other studies were consulted and compared with those emerging during analysis.

Statistical Analysis Outline

Descriptive and inferential statistics were used to analyze quantitative data. Multiple regression analysis was used to discuss relationships. Sweet and Grace-Martin (2012) argued that multiple regression examines how two or more independent variables affect the dependent variable(s). Gamification as an independent variable was broken down to video game elements (IVs) such as avatars, quests, badges, and points. The dependent variables (DVs), engagement and motivation, were measured as ordinal variables through five-point Likert scale survey.

To find out the most influential independent variable in affecting motivation and engagement, multiple regression analysis was conducted to understand if there is a correlation between gamification elements and motivation and engagement. A multiple regression test is used when there are multiple dependent variables and one or more predictors to understand correlations (Sweet & Grace-Martin, 2012). Based on Field's (2009) model, multiple regression in combination with ANOVA works well if the independent variables are both discreet (avatars, quests, badges) and continuous (points).

Game metrics were monitored in the three classes where gamification was implemented to verify that they accurately reflected the state of each individual student. For example, the

game metric report for one student showed lack of activity, which might be understood as disengagement or lack of motivation to participate; however, the student might have been absent or sick. This revealed the importance of using game metrics hand in hand with interviews to ensure triangulation by confirming the results with the students.

Analysis started as early as during data collection in looking for themes and patterns related to the research question. As patterns emerged, they were checked to see if they supported other quantitative findings. For instance, one of the emerging themes during observation, interviews, and artifactual data, was fun associated with the use of video game elements. The word fun and its antonyms were scanned to study their frequency and the context of their appearance in the qualitative data sources then triangulated with quantitative data to help answer the question of whether fun afforded in the game environment led to better learning experience.

Observations were analyzed to look for signs of physical engagement in terms of the time students spent on task, their visible signs of involvement in different gamified events, their evident interest in the task, the relevance of the questions they asked, the liveliness of conversations they had with the professor and among each other in class and shortly before and after class. Professors were observed collecting information on their method of implementing gamification in their classes, in addition to contextual differences in their experiences and background on this topic. In a similar vein, observations helped show whether motivational elements were active in different class sessions and whether they were related to autonomy. In addition, observations helped determine whether competence was fostered allowing students to gain recognition in the gamified environment.

Ethical and Confidentiality Issues

Maximum ethical and confidentiality measures were observed. The consent of subjects and the approval of the institutional review board (IRB) were obtained prior to any data collection. The participants' confidentiality was protected by storing the electronic data in password-protected computer and paper documents in a locked safe in an office at the researcher's home.

The identity of the subjects was protected by using pseudonyms and the data collected was used for research only and was not shared with anyone. The participants were asked to sign a consent form (Appendix G) and were notified that their participation was voluntary. They were informed that they might decline to answer some or all the questions in the survey or interview. The consent form informed the participants that the observations of the class activities might be videotaped, and they might choose not to be observed or videotaped. The participants were also informed that there was no compensation for their participation in the study. The selection of the participants was based on their enrollment in the courses where gamification was implemented.

Limitations of the Study

The main limitation to the findings from this study relates to scale and generalizability to a larger population. In addition, the attitudes and beliefs of the professors influenced the selection of video game elements in the courses, and findings encapsulated those elements the instructors used. For example, the effect of rewards in the form of points and badges on motivation and engagement could not be fully evaluated because of the limited scope of their implementation.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

There are five emerging themes organizing this chapter: Effect on Motivation, Effect on Engagement, Effect of Gamification on Learning, Effect of Interactivity on Learning, and Effect of Context: Factors in Gamified Learning Opportunities.

Under the first theme, Effect of Motivation, competence, autonomy, and gamification elements which negatively influenced motivation are discussed.

Under the Effect on Engagement, the following subtopics are included: Quests, impediments, motivation and engagement in task value and task completion, in addition to future participation and requesting more video game elements.

The third theme, Effect of Gamification on Learning, includes the following subheadings: Avatars: Dr. Edwards's class, literacy skills: Dr. Peterson's class, expanded teaching repertoire: Dr. Jones's class, fusion of learning and play, learning as meaning-making in gamification, and desirable behavior change.

The fourth theme, Effect of Interactivity on Learning, covers the following subthemes: Collaborative learning: Relatedness, Role-related learning, and competitive interaction.

The last theme, Effect of Context: Factors in Gamified Learning Opportunities, includes the following subtopics: Variations among sites: Instructors and content areas, student willingness and experience, and differential learning opportunities.

Effect on Motivation

Competence

Before analyzing data, it is useful to establish connections to relevant theory concepts. Based on the self-determination theory, the learning experience is improved provided that the

inner motivational needs of competence, status, and autonomy are met (Baard, Deci & Ryan 2004). Competence, the opportunity to show one's abilities and gain recognition, and autonomy, the opportunity to express oneself and make choices, have been described as motivational affordances by Hamari, Koivisto, and Sarsa (2014). Strongly connected to competence is performance orientation referring to the extrinsically motivational elements in the desire for good grades and to appear accomplished (Dweck, 1986; Dweck & Leggett, 1988; Elliott & Dweck, 1988). Francisco-Aparicio et al. (2013) argued that when learners are empowered to make choices supporting their autonomous needs, their learning experience is thus improved.

Moving from theoretical concepts to data showed many students who considered themselves as self-motivated expressing satisfaction in impressing other classmates with their knowledge and skills. One of the in-service teachers in Dr. Jones's class, echoed this idea of his determination to gain status and recognition in the gamified environment: "I like badges. One of my favorite elements in the games is badges. I like impressing other people with my achievement. It [the desire to gain recognition] instills pride and sense of achievement in students" (Ray, personal communication, April 18, 2017). His classmate reiterated the idea of the desire to gain status in acknowledgement of skills: "I would like to impress others with my achievements" (personal communication, April 17, 2017) and "I like competing and winning" (personal communication, May 22, 2017).

A student in Dr. Peterson's class also emphasized her individualistic qualities to succeed and excel: "I personally see myself as a go-getter . . . smarter than other people. So, I love to show my knowledge even working within a team" (Chloe, personal communication, June 5, 2017). Team success with game quizzes motivated her classmate: "I really wanted my team to

win, so I tried hard to get as many answers as possible. It felt good to show the class our skills and knowledge" (personal communication, June 6, 2017).

The in-service teachers in Dr. Jones's class did not show similar signs of trying to gain recognition except for one who was open about his desire to gain status. He connected his own experience to that of his students in his school as he started using similar gamified techniques: "During the gamified events, I wanted to be on the top of the leaderboard. This helped also [with my] students' experiences as they achieve recognition in my class" (personal communication, May 8, 2017). His colleagues were not keen on taking the lead or achieving status, yet some saw the potential of this game affordance in meeting their own students' needs for recognition, one explaining: "Many of the kids I teach appreciate attention, and one way to fulfill this is through allowing them to be recognized in the gamified environment" (personal communication, May 6, 2017).

The desire to impress others with one's knowledge and skills was also highlighted in survey responses, with more than 80% of the students agreeing that: *Being able to impress others with my achievements during the gamified activities motivated me to do well*. To understand these results, *motivation* and *engagement* was regressed on *competence*, yielding positively significant relationships (β=.443, p<.05) and (β=.460, p<.05) respectively. That is, there was a positive correlation between *competence* and *motivation* and also between *competence* and *engagement*. Thus, the survey data confirmed interview data in suggesting that competence may have increased due to student motivation and engagement.

Autonomy

The autonomy needs of students were reportedly supported by gamification in all three classes. For many students, the avatar assignment reflected their own choices in creating digital

images of themselves in the present and projected representations into the future. Many considered the opportunity for choice in self-representation to positively affect their motivation. For example, Jack, a student in Dr. Petersons' class, explained:

The avatar assignment became compelling to me because I started thinking [about] why I like characters like this. It is because it is my decision and my choice. Every college essay I have written so far is about writing about yourself and how you see yourself in the future. I can't even tell you how boring these essays are to write! Typically, they are just bland essays to write, and you do so many of them that trying to get people to think about these issues in a different way is really useful. The avatar assignment became more interesting as I started thinking about the reasons for me to write. (personal communication, June 6, 2017)

One of his classmates connected autonomy to improved learning experience: "I chose my avatar carefully, and I think that if we could use the avatars we created in the game quiz, it [learning] would be much better" (personal communication, June 5, 2017). For Jack, the opportunity to make design choices during gamified activities transformed the usually mundane essays assignments into "compelling, enjoyable tasks" (personal communication, June 6, 2017). A student in Dr. Jones's class added forcefully: "For any successful use of gamification in teaching and learning, there has to be full empowerment of the students. You know, they should be given freedom to make choices throughout the entire experience" (personal communication, April 18, 2017).

The freedom of choice observed in Dr. Jones's class corresponded with a positive perception of autonomy among the in-service teachers enrolled. Dr. Jones suggested his students could choose multiple online tools for the avatar-creation assignment and could create their own gamified activities to use in their K-12 teaching. An in-service teacher in Dr. Jones's class

expressed the importance of choice-making: "Making choices is the best part of the gamified activities in Dr. Jones' class. In my own teaching practice, I can't choose for my students their avatars, imposing race, ethnicity, and gender on them. They need to do that themselves" (personal communication, May 8, 2017). A classmate, however, extended the range of applicability of choice in gamified activities for public schools: "I think the more options, the better for kids. . . . I think student choice is very important in general and specially in a game environment (personal communication, May 6, 2017).

How lack of autonomy in some instances affected motivation. Unlike the avatar assignment in which students were allowed to create their own avatars, during the game quizzes, many students were assigned avatars by the two professors, Dr. Edwards and Dr. Peterson, in order to save time. ClassCraft gamification software allowed the administrators (the professors) to create and modify their players' avatars. A student in Dr. Edwards' class criticized the lack of control over parts of the game quizzes referring to how the answers given by students were discussed first by the professor, delaying the pace of the game: "[The answers for the game quiz] needed the professor's approval. It slowed everything down!" (personal communication, April 17, 2017).

Both Dr. Edwards and Dr. Peterson adopted *Voki.com* as the online-software tool for the avatar-creation assignment. Although they did not directly indicate it was mandatory to use only this website, their instructions focused on the use of this online tool which many students found limited, difficult to use, and outdated.

Unsatisfied with the website Dr. Peterson recommended for avatar creation, Jack hired an artist to create an avatar (Figure 3), matching his best role-playing games (RPGs) which he decided to use on all of his social media pages. Jack shared the avatar he commissioned during

an interview. Similarly, one of his classmates faced some technical challenges and addressed Dr. Peterson: "I had a hard time printing my avatar using the software you recommended, but I can email it to you," (Alexandria, observation, May 8, 2017). In this instance, Jack's decision in

My Portrait   Canas's Fire Emblem Portrait

Figure 3. Jack's portrait (left) used in his avatar paper representing favorite game series (right).

choosing a different website other than the one recommended by Dr. Peterson was not unique to his case but rather done by many students in the same class and in Dr. Edwards'. Chloe, in the same class, during an interview with her on June 5, 2017 stated: "I chose a software tool different from what the professor suggested. . . . Many of the students thought the avatar creation tool that the professor selected was limited so many of them found their own online tools."

In Dr. Edwards's class, both Lindsey and David chose different online tools for their avatar creation project. When David submitted his paper to Dr. Peterson, he explained: "I created my avatar using Avatarmaker.com. I found it more user-friendly and it had many options to choose from to create an avatar. I hope this is OK, Dr. Edwards?" (observation, April 26, 2017). When asked about his opinion of the avatar assignment by Dr. Edwards, one student answered:

"The software tool wasn't complicated, but overall it was not a comfortable website, and the art was limited. I did not have many choices. I ended up doing something different" (observation, March 2, 2017).

Many students found the avatar-creation tool, *Voki.com*, to be lacking enough features to allow for accurate self-representation and some of them, during the observations, exchanged links for alternative more user-friendly websites.

Dr. Jones allowed his in-service teachers the freedom to choose any online tool to create their avatar assignment which was designed to give the teachers options to possibly use it in their own teaching practice.

Qualitative data on motivational affordances in the three WSU classes were verified by quantitative data from the student survey. Students were asked whether the content of the gamified activities addressed their interests, whether they felt motivated and satisfied with their gamified experience, and whether they thought they had a choice during the gamified sessions. More than 80% agreed that the use of gamification addressed their interests and offered them satisfying experiences. When asked whether they had choice during the gamified activities, nearly all (97%) thought their autonomy needs were met. As to whether they were motivated when gamification was implemented, 88% agreed.

Multiple regression analysis was used to determine whether there was an association between autonomy and competence, on one hand, and motivation and engagement, on the other hand. While autonomy had a significant relationship with motivation ($\beta=.153$, $p<.05$), there was statistically insignificant relationship between autonomy and engagement ($\beta=-.155$, $p>.05$).

The disparate findings between the effect of autonomy on motivation and its effect on engagement could be explained considering the details of how autonomy was manifested in two

of the three courses. Avatars were utilized in Dr. Peterson and Dr. Edwards's classes in two different ways: the gamified quizzes and the writing assignments. During gamified quizzes, the avatars representing each player in the game or each team were assigned automatically using ClassCraft gaming software. This feature was activated by the two professors for practical reasons related to saving time. Some students were visibly unhappy with their avatars during observations or as stated previously during interviews. Students were allowed more control during writing assignments to create and design their avatars. In Dr. Jones's class, in-service teachers were given total control of their gamified experience and none of his student teachers mentioned lack of autonomy as an impediment.

While quantitative and qualitative data support the proposition that students' needs for autonomy and competence, were largely met through the utilization of gamification in the learning activities in these three WSU courses, gamified quizzes lacked choice elements which may have reflected negatively on learners' engagement in Dr. Edwards' and Dr. Peterson's classes. This may explain the statistically insignificant relationship between autonomy and engagement.

Gamification Elements Which Negatively Influenced Motivation

Zichermann and Cunningham (2011) proposed that points, as extrinsic rewards, would facilitate the intrinsic motivation and the data were examined for confirmation of this proposition. Points were integrated in the syllabi of two of the courses in this study and were implemented in all three courses during the game quizzes as allowed by ClassCraft gamification platform.

During the classroom observations, many students showed little reaction to either gaining or losing points. For instance, when Dr. Peterson awarded a female student thirty-five points for

her avatar paper, she smiled and appeared more interested in the writing task. In a sixty-minute interview with Jack, he never mentioned rewards and points and discussed what worked well during the gamified experience he had had and what he thought could be improved (personal communication, June 6, 2017). Another student commented on the use of points:

> I think that points could be both positive and negative. I noticed that some students in Dr. Peterson's class liked them. For me, I think they could backfire. You know you get the reward or whatever and then what? It is like no big deal! I believe that we should have a better reason to study and learn that just earning points or reward. (Chloe, personal communication, June 5, 2017)

Some students in Dr. Edwards' class were also critical of the points system and questioned their purpose. One commented: "I don't think I would like to replace the final grades with points. For most of us, it is what we want to learn. . . . Point system does not work very well" (personal communication, May 22, 2017). Her classmate amplified her answer: "Points and rewards in general don't work well for me, and I think for most of students in the Honors College. [Learning is] what I want to do, and points don't add any value to my feeling about this" (personal communication, May 18, 2017). The delivery of points in Dr. Edwards' class was specifically critiqued for lacking a leaderboard to track progress: "I am a highly-motivated person. I still appreciate the points and rewards. It was like classical conditioning. You still get the points and rewards. . . [but] I wish I saw a running total, like at the end of the class showing the points and rewards" (Brooklyn, personal communication, April 17, 2017).

Dr. Edwards and Dr. Peterson expressed reservations about the use of points in their courses. Although both professors had used points in a limited way, they expressed reluctance about expanded use. As to his future plans, Dr. Peterson explained:

I may not be able to use points with writing assignments because the students are continuously required to revise and edit their paper, and I don't see how points can be used here. However, when I checked ClassCraft, I saw that it had Boss battles, and points were nicely used in the game quizzes, so I plan to use them in that way. (personal communication, May 20, 2017)

Dr. Edwards had the most critical opinion of points and considered them as symbols of a capitalistic culture:

For me, gamification, specifically the reward system, is part of late capitalistic economic initiative that I am completely suspicious of. . . . Gamification has to be a critically conscious activity that redesigns society in the direction of justice and shared resources. (personal communication, June 5, 2017)

By contrast, Dr. Jones justified the use of rewards in the form of points and badges based on behaviorist theoretical principles: "Psychologically, we are wired to work toward rewards. We are trying to level up and we keep track of our progress creating smaller chunks of our learning experience vs the more mysterious question: have I learned something?" (personal communication, January 2, 2017). Dr. Jones modeled for his in-service teachers the use of rewards to support learning behaviors, as one of his students enthusiastically explained:

We were encouraged to gain rewards. Dr. Jones modeled for us how to use them in our teaching. This is how the use of gamification in the class benefited me. We had to participate more [because] the way the system was set up is that you would gain or lose points based on your participation in the classroom." (male student, personal communication, April 18, 2017).

Another student questioned the logic of points distribution in the game quiz, asking Dr. Jones: "Why do all the questions have the same number of points? You know, they should correspond to the level of difficulty?" (observation, April 15, 2017).

A form of rewards employed by Dr. Jones was badges which also contributed to many students' positive perception. For example, one in-service teacher commented on the use of badges in his own teaching and in Dr. Jones's class:

I am using ClassDojo which allows for the use of avatars, points, and badges. [My] students are taking control of their learning. I specifically like the use of badges and the many sites Dr. Jones used employing badges. I think they were the most interesting part of the game environment. (personal communication, April 28, 2017)

Another classmate considered badges the most interesting video game element:

One of my favorite elements in the game is the badge system. I am playing right now Battlefield 1, and it is a struggle to earn badges. I like impressing other people with my achievements. It instills pride and sense of achievement in students. So, I think badges are one of the cool things in the game environment." (personal communication, April 18, 2017)

Survey data suggested that rewards negatively impacted both motivation and engagement. Significantly negative relationships between rewards and motivation (β=-.374, p<.05), and between rewards and engagement (β=-.521, p<.05) were correlated. When points alone were analyzed for correlation with motivation and engagement, no significant relationship was detected with either motivation (β=.163, p>.05) or engagement (β=.194, p>.05). As to whether points positively affected their engagement and motivation, the majority of the students (62.2%) felt neutral.

Students' perception of the use of badges reflected the survey results of a majority of all who thought badges were unnecessary, irrelevant, and even "silly" (observation, March 7, 2017). However, 37.8% of the students were in support of the use of badges and had positive views of their effect on motivation and engagement. Despite the positive experience many students had in Dr. Jones's class with the use of rewards in the form of points and badges, the majority of the students in the other two classes did not share their views which affected the overall significance of this gamification feature.

Deci, Koeshner, and Ryan (2001) posited that *badges* would have a negative effect on students' motivation and satisfaction. Not only badges had an insignificant relationship with motivation (p=.655), but also the standard coefficient showed it was going in the negative direction (-.18). The statistically negative relationship between the use of badges and engagement (β=-.130, p<.05) supported Deci, Koeshner, and Ryan's (2001) views. When asked to respond to this statement: *Badges positively affected my learning experience during the gamified events*, 37.8% agreed, 46.7% were neutral, 4.4% disagreed, and 11.1% strongly disagreed.

In sum, the majority of the students felt that rewards not only undermined their intrinsic motivation, but they also negatively affected their engagement in the gamified events. Dr. Jones's support of the use of rewards to encourage certain learning behaviors may have positively influenced many of the in-service teachers' perceptions of their use in teaching. In the context of the three WSU courses, quantitative and qualitative data sources refute the proposition that points and extrinsic rewards in general motivated students intrinsically. Both sources of quantitative and qualitative data suggested that the use of badges did not affect learners' motivation while it was causing a decline in their levels of engagement.

Effect on Engagement

Engagement refers to students' focus on task, absorption in the gamified events, awareness of distractions, and willingness to participate. Observation data recorded visible signs of engagement during the class sessions. For instance, students in Dr. Edwards's class appeared attentive and focused, especially during the avatar assignment. They asked Dr. Edwards multiple questions about how game quizzes worked and the logic behind the point system. Dr. Edwards reported the students highly interested in the avatar assignment from their feedback in email and during class sessions. Some students stayed after class during the observation period to ask Dr. Edwards questions about the gamified events and how the point system translated into grades.

One feature about which students asked was the game quizzes for which a leaderboard tracked progress in terms of scores at three different times. Students in Dr. Edwards's, Dr. Peterson's, and Dr. Jones's classes all showed progress in quiz scores (See Figure 4). This could be indicative of their engagement in the gamified quizzes.
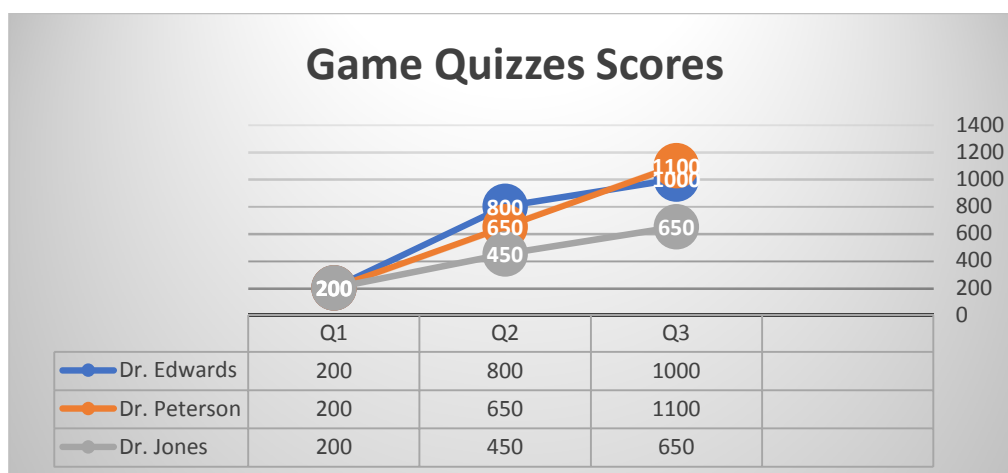
Figure 4. Score progress during game quizzes

The gamified cultural simulation in Dr. Edwards's class facilitated students' engagement which helped them learn, according to one student, life-like skills:

I felt I was really focused during the gamified activities. . . . We were all focused. It was different from Professor Edwards just teaching. We learned some valuable skills during the gamified simulations which could help us in our future career. (personal communication, May 22, 2017)

Another student added: "When we did the video game in class, that class went faster than . . . when listening to Dr. Edwards" (personal communication, April 17, 2017). A classmate summarized: "I felt like I was really focused on the games. It was definitely motivating and engaging. . . less boring. I liked the sense of satisfaction and accomplishment" (personal communication, April 24, 2017).

In Dr. Jones's class, many in-service teachers appeared engaged in the gamified activities to explore the potential of gamification as a tool in their teaching. They asked many questions and some of them were critical of the efficacy of gamification from a pedagogical standpoint. One critiqued the avatar assignment for cultural and religious considerations noting that many parents of Russian descent had considered the images used in the past for avatars as Satanic.

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A classmate evaluated the gamified activities in terms of the time he needed to master them, which he said he could not spare. One of the youngest teachers in Dr. Jones's class, who appeared deeply engaged from day one, was experienced with using gamification in his teaching. During an interview, he said that he had used ClassDojo, a gamified online platform, with positive results on his students' engagement and feedback from parents. Unconsciously echoing Csikszentmihalyi (1997), he asserted: "Gamification allows students to feel deeper and get the essence of the experience" (Ray, personal communication, April 18, 2017).

A mechanical engineering student in Dr. Peterson's class appreciated the virtual environment and high-quality graphics used in the gamified activities:

It was motivating and different from other science classes I took, something new. It has a fancy look! . . . I was focused during the gamified activities. I had it in mind that I did not want to lose or be the last one to perform the task. (Ahmed, personal communication, June 6, 2017).

A classmate also acknowledged that he was focused in the gamified activities, reporting: "Yeah! I was totally engaged. I think there was a lot of fun, and I think it is more compelling way to take quizzes. It promotes teamwork and discussion that traditional quizzes don't. I think it is an excellent way to do it" (Jack, personal communication, June 6, 2017).

Dr. Peterson confirmed his students' signs of motivation and engagement: "I believe the students were really motivated to participate and engage in the gamified activities and to participate in the different video game elements used in the course" (personal communication, May 20, 2017). He expressed his consequent commitment to using video game elements in future courses. Contrastingly, Dr. Jones noted obstacles which undercut some students' receptiveness to engaging video game elements, particularly their lack of exposure to technology

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in general. In his experience, he said, graduate students who were in-service teachers are less willing to experiment with new technology (personal communication, January 2, 2017).

Indeed, during observations and interviews with students in Dr. Jones's class, some in-service teachers were skeptical or critical of the video game elements in the course. The younger students declared themselves more motivated to explore and engage in the gamified activities than their older classmates did. Two of the older students cited many obstacles that would prevent them from incorporating game mechanics into their teaching, especially time and work load. Dr. Jones, at the end of the semester, emphasized that these students had become more willing to discuss gamified alternatives and more receptive to this approach than before (April 28, 2017).

Dr. Edwards also noted that video game elements had increased his students' engagement: "I think that the task appreciation and time on task did certainly increase in the politics of beauty [avatar] paper and cross-cultural gamified simulation" (personal communication, May 2, 2017). He expressed interest in more integration of video game elements into class content, justified logically and pedagogically. From his perspective, the avatar paper had been successful because it was well-integrated and interconnected to the students' lived experiences. Overall, the students in his class: "were fully present. That is magic!" (personal communication, May 2, 2017).

Quantitative data confirmed qualitative data that indicated the positive effect of video games on engagement. When students were asked to respond to this survey statement, *I felt absorbed in the class activities which employed video game elements*, nearly 85% agreed (or strongly agreed). When asked whether they were focused while performing the gamified tasks, a slightly higher proportion of them agreed. In addition, when the students were asked if they

would participate again in the gamified activities as it influenced their engagement, 17.8% strongly agreed and 60% agreed. Multiple regression yielded significant results in positively correlating video game elements and engagement (β=.397, p<.05).

All in all, the use of gamification in the three WSU courses motivated the students to actively participate in the learning experience as it met their inner motivational needs for competence, status, and autonomy. Gamification had an overall positive effect on learners' engagement in the three WSU courses. The use of video game elements and affordances in the three WSU classes lead to increased motivation and higher levels of engagement which may have facilitated learning.

Quests

The most influential gamification feature which promoted engagement was the use of quests which enhanced collaboration among students during the various class activities. All assignments in the three WSU courses have been changed in the form of quests or missions to complete different tasks. Regression analysis yielded statistically significant positive relationship between quests and motivation (β=.386, p<.05) and engagement (β=.598, p<.05).

The instructors positively perceived the use of quests in their classes. Dr. Edwards described quests as "symbolic travel; traveling to a new sense of self in relation to the other." (personal communication, May 31, 2017). Additionally, Dr. Peterson confidently connected the use of quests in his class to past successful experience:

> I have already used quests in my teaching of literature. I have asked the students to use role play and impersonate some historical figures and every team had a quest or an assignment to search for the truth solving mystery and mysterious crimes. (personal communication, May 8, 2017)

A student in Dr. Edwards' class, reported that quests had engaged the students in learning: "I think the idea of changing assignments to quests in Dr. Edwards's class was clever because it helped the students relax and learn at the same time. It helped us digest complex issues such as race and the politics of beauty. I can't remember the last time we had any similar class where we all stayed focused and engaged in course assignments" (personal communication, April 24, 2017).

A student in Dr. Jones's class commented during an interview: "Working with classmates on missions and quests to finish or complete a task in the classroom helped us stay on task and enjoy it at the same time" (personal communication, April 18, 2017). An in-service teacher, he related the use of quests to his teaching practice explaining how this impacted his students positively:

I actually used different game elements in the classroom during my practicum experience. I used quests in my own gamified platform for a game called Mission in a virtual reality setting. Students were acting as slaves . . . and were asked to escape from South to North to experience how it feels to be a slave during that period. Children felt they were on a mission and had a better response and focus playing the game more than if they read a book (personal communication, April 18, 2017).

Impediments

Engagement in the three courses was evaluated based on the time students spent on task, their level of focus while performing the task, their awareness of distractions, and task completion. In some instances, the students used this term *engagement* loosely to describe their psycho-emotional state. In Raven's (1993) model of competence, affective and conative behaviors were distinguished. The affective component of behavior explained the emotional

attachments, positive or negative, an individual connected to a task as separated from the

conative aspect of behavior which is "putting in extra effort to reduce the amount of risk [or

negative outcome] involved in the activity" (Raven 1993, p. 95) regardless of whether the task

was enjoyable.

Conative behavior seemed to describe Brooklyn's approach to the avatar assignment. She

stated that the topic choice of race caused her to lose engagement, yet she stayed on task and

completed the avatar assignment on time. She had actually lost a positive emotional attachment

to the task, she was not enjoying, but she remained engaged in the task, demonstrating conative

determination. She managed to stay focused, minimizing her discomfort with the topic choice by

creating an avatar of her mature self as a middle-aged married woman. She described her

struggle:

> The avatar assignment was interesting and the most challenging assignment I did all year.
>
> Honestly, I was thinking, "How am I going to create an avatar without using
>
> stereotypes?" It wasn't the avatar part, but the paper writing part. I did not want to
>
> accidently say or do something that was stereotypical. . . .The avatar assignment posed a
>
> challenge and increased my growth, but it undermined my engagement because I had
>
> hard time writing about it. (personal communication, April 17, 2017)

Similarly, Kamila, an African American student had struggled with the topic choice and

seemed visibly concerned during the observation of Dr. Peterson's class and decided to ask him a

question:

> "Do I have to create an avatar of a different race?"
> Although Dr. Peterson assured her that she could choose something different, he
> expressed his preference for creating an avatar figure of a different race: "I encourage
> you to expand your imagination and visualize yourself of a different race," he said in a
> solemn voice.

Kamila nodded her head and took a quick look at her friend in the back, making a gesture to show her dismay. (observation, May 11, 2017)

She was late submitting her avatar assignment paper: "I am sorry to bring it late, but I struggled to finish it."
"I am curious to see your avatar choice," said Dr. Peterson.
"It's a native American chief from the Nez Pierce tribe," said Kamila in a soft tone.
"Can't wait to read your paper, thank you." Dr. Peterson replied. (observation, May 20, 2017)

Although Kamila struggled with the avatar assignment's involving race and was visibly uncomfortable as in the first observation, she managed to complete the task, choosing a Native American figure and her determination to stay focused on task reflected her conative strength.

Not all students felt comfortable in the gamified competitive environment, as some felt peer pressure or were nervous about embarrassing themselves or others. Almost every time the students were asked by any of the three professors if they preferred to work in teams or individually, they chose teamwork. Some students preferred this method of interaction especially during the game quizzes because, they said, they did not want to be in the spotlight: "I only had one chance during the game quiz and . . . I was stressing out that I am going to mess it out in front of everyone" (Brooklyn, personal communication, April 17, 2017). The sense of pressure and or stress was shared with a student in Dr. Edwards's class who said:

I felt pressure to answer. If you did not it was kind of embarrassing. . . . When we did the quizzes, it was, like, stressful if you got it wrong or did not get the answer or whatever. We were kind of stressed out because you would be on the spot in front of everyone (Lindsey, personal communication, April 24, 2017).

A student in Dr. Jones's class was visibly nervous when called upon to answer a question during the game quiz (observation, April 20, 2017).

The topic choice of writing about race representation, the discomfort of being on the spot during the gamified quizzes, and lack of exposure to gamification for the in-service teachers caused a negative effect on the psyche-emotional state of some of the students. However, this did not amount to task disengagement.

Motivation and Engagement in Task Value and Task Completion

Task value could be an indicative of motivation and task completion can reflect engagement. There is a strong connection between task completion and engagement process in the learning activities (Sonnentag, 2017). Task value is the perception of the importance and usefulness of the task (Hsieh, 2014) which is linked to intrinsic motivation (Husman et al., 2004). Research has shown that gamification can optimize task value among the learners and lead to increased task completion (Brewer et al., 2013; Armier, Shepherd & Strabut, 2016).

Increased interest in task value and task completion were both supported through gamification in Dr. Peterson's class as one student stated:

It definitely made the class more interesting and unique in many ways. The game quizzes on the weekly readings made them more compelling. I like to read, but the game techniques Dr. Peterson used motivated me more to finish the readings. I think the same thing could be said for the writing papers. I compare the assignments in this class to English 101 for example, and I see a big difference. (Chloe, personal communication, May 30, 2017)

For another classmate, gamification renewed interest in reading and writing tasks and supported task completion:

The game quizzes Dr. Peterson used made me feel interested again in English writing.

Also, this is the first time in my life I finish a story book. In the beginning, I just wanted

to answer the questions correctly for the game. But now I like reading more than before.

(personal communication, June 5, 2017).

Multiple testimonies from Dr. Peterson's class reflected the students' opinion that game

quizzes motivated them to complete the assigned readings and improved their attention to details

while reading. In a similar manner, the students in Dr. Edwards' class all of whom were honor

students and many of them described themselves as self-motivated, produced writing that

progressed rapidly from the beginning to the end of the semester. This was based on Dr.

Edwards' remarks which he left on students' papers as part of the written feedback. For example,

in a written feedback Dr. Edwards provided for one of his students, he said: "These are quietly

brilliant insights that show the sophistication of your analysis of the politics of beauty in this

avatar assignment. This is -first-rate analysis of a crucial topic. You must extend this paper in the

future. Congratulations!"

A student in Dr. Edwards' class commented on the effect of video game elements on her

appreciation of assignments:

The English course with Dr. Edwards is a prerequisite course which all students in the

Honors College had to take. Initially I did not feel motivated to write about the topic of

race. The gamified parts, especially the avatar assignment, helped me overcome this

sense of nervousness to write on this topic. It also helped me complete my essay and

letter to the editor. (Lindsey, personal communication, April 24, 2017)

Toward the end of the semester, Dr. Edwards asked students their opinions of the gamified

experience they had had in his class:

"I would like to get your opinion, if possible, about the use of video game elements in this class. Please, before you do, I like to hear your honest evaluation whether negative or positive," Dr. Edwards addressed the students in a firm tone.

Maya raised her hand and said: "I can see some potential in using them, but I am not all crazy about video games. I have never played video games before."

Before Dr. Edwards could respond, David abruptly said: "I totally disagree! I think this is by far the most interesting English class we had." Many students nodded their heads in agreement. David continued: "We covered very sensitive issues in a fun and enjoyable way. Above all, I started to enjoy writing following the avatar assignment. I even sent a letter to the editor using one of the papers I created in this class."

Dr. Edwards shook his head and looked up toward the projector as if he was thinking about what David said, "Anyone else want to share his views on this?" Dr. Edwards looked at the far corner as if interested in hearing from the quiet students.

Brooklyn raised her hand and after she got permission from Dr. Edwards, said, "I can connect to many things we did in this class with video games. I feel that my writing improved a lot, and I enjoyed the reading assignments more than any other class." (observation, April 26, 2017)

Dr. Jones's course focused on integrating technology into the K-12 curricula where the task value was how successful could the use of gamification be in the students' teaching practice. Some of the in-service teachers saw potential in the use of gamification in teaching, and others, who had already used it in the past, understood how effective it could be. For example, a student who became more receptive and less skeptical about the efficacy of gamification strategies in a pedagogical context said:

I think that they could be effective. As long as I can plug in the content into the game,

they are effective. . . since the kids have a lot of experience and exposure to the game

environment. . . . It motivates them. (Katherine, personal communication, April 24, 2017)

A classmate reported the value of gamification in promoting learning for digital natives:

"Video game elements are wonderful for the classroom. I wish that we have more video games

in English language arts and history because students like them, and I think they do improve

their learning" (Stephen, personal communication, April 28, 2017).

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The positive perception of the students regarding gamification was realized in strong commitment to completing the assignments, sophisticated levels of writing, and genuine interest in using gamification in their own teaching.

When surveyed and asked if the gamified events helped them complete their assignments, nearly 96% of all students agreed. When asked whether gamified elements had increased their interest in course content and assignments, nearly 80% agreed. These results corroborated qualitative data indicating the effectiveness of gamified components for increasing student interest in tasks, facilitating task completion, and learning. Analysis through multiple regression showed significant positive correlation between task value and motivation ($\beta=.744$, $p<.05$) and between video games and task completion ($\beta=.557$, $p<.05$).

Future Participation and Requesting More Video Game Elements

The willingness for future participation in the gamified activities could be connected to students' past and present motivation. Students interest in additional video games incorporation in future classes suggested their engagement in the ones they experienced in all three courses. One elaborated: "I really liked the use of video games in this course. I wished we used it more to be honest. We need it like three to four times a week" (Maya, personal communication, May 22, 2017). Another detailed:

> We should use the game quizzes for review . . . learning not as much as testing. When I take a test, there is a lot of pressure associated with it. When it is gamified, it is just like that, quick! I [also] wish we had more progress [feedback], so we start in one place and see our progress. (Brooklyn, personal communication, April 17, 2017).

Other students connected effective use of gamification to wider implementation of video game elements and more frequency, one declaring:

I think for it to be more effective, we need to implement it more throughout the semester. . . . If I had a choice between gamified and non-gamified, I would choose a gamified one because everyone had fun with it. . . . I would participate in the future in a gamified assignment because it was good and kept people engaged. My generation grow up used to this. . . . [Although] I am not a video game player myself, I am used to social media and internet, and this game environment brings something relevant. (Lindsey, personal communication, April 24, 2017).

One student was especially emphatic about his desire for more video game elements, repeatedly suggesting how more game mechanics could be integrated using the word "more" five times:

I think more of everything [is] kind of necessary. I felt fairly limited about how much gamified activities were implemented in class. I was really interested [in] more gamified activities in class, but [we] never got the opportunities to implement more video game elements. So, more time . . . more integration because, if it is [merely] something on the side that nobody is interested in and no one is vested in, then it ends up losing its impact. (Jack, personal communication, June 6, 2017)

The majority of the students (91%) preferred more video game elements, more frequent implementation of them, and more integration of them into the curricula. Multiple regression analysis positively correlated future participation with motivation (β=.517, p<.05) and with predicted engagement (β=.588, p<.05). These results indicated that students were willing to participate in future gamified events as they connected this to increased motivation and engagement.

To summarize, the use of video game elements in the three WSU classes not only reflected an increased intrinsic appreciation of the task, but also parallel improvement in the learners' engagement as reflected on task completion. The willingness to participate in future gamified events, as an indicative of motivation, and the request for additional video game incorporation, as a sign of engagement, were both evident. The majority of the in-service teachers valued the use of gamification features as a technological tool to aid in learning and teaching.

Since the use of gamification reflected positively on learners' motivation, engagement, in addition of the appreciation and completion of the task, it is important to consider its effect on learning. Subsequently, the next section addressed the gamification effect on learning.

Effects of Gamification on Learning

The effect of gamification on learning in the context of the three WSU courses emerged as a main theme which was evident in several ways. The first aspect of this effect on learning was the improved literacy of the students who were exposed to the gamified experience as it showed improved writing and reading skills, specifically in Dr. Edwards's and Dr. Peterson's classes. The last affect was particularly unique to the in-service teachers, in Dr. Jones's class, expanding their repertoire of teaching strategies. In the next section, all of these manifestations of the effect of gamification on learning are discussed as they pertain to each of three courses. Each gamification feature and affordance will be analyzed in detail as it was used in each class to understand which ones were most effective in producing positive effect on learning.

Avatars

The expression "rhetorical mirror of the self," describing avatars, was used by David, one of the students in Dr. Edwards's class, while commenting on the avatar writing assignment. In

doing the avatar assignments, students had to create avatars as a vehicle for writing about the politics of beauty and representation. Toward the end of the semester April 19, 2017, David received this feedback from Dr. Edwards: "Your writing became more mature and sophisticated. I am impressed by your comment on avatars as 'rhetorical mirror.' I am glad your connectivity with the topic produced these results."

Brooklyn stated that the avatar paper reflected a growth and improvement in her writing skills:

That paper saw the most growth in me and the one that Dr. Edwards was the most proud of. It changed the way I write from logical, step-by-step to emotional and personal. I created an avatar of my beautiful, professional self and how it would be. (personal communication, April 17, 2017)

The above statement was also reflected in Dr. Edwards's feedback as he commented on her writing: "Brooklyn! Your writing leaped from beginner levels to intellectual maturity. You truly showed tremendous growth and progress using the art of persuasion or rhetoric to advance and explain your views on the politics of beauty avatar paper. Congratulations!"

Improvement in writing was evident with other students as well in Dr. Edwards's class. Lindsey explained how the avatar creation process caused her to engage thinking skills and reexamine some concepts:

I was forced to change my mindset when approaching this assignment. . . . The creation of this avatar, and the culture and the physical attributes that she possesses, are framed under the politics of American professional world, and under the politics of what I, personally, view as beautiful.

In a similar manner to other students, Dr. Edwards commended Lindsey in a written feedback for a noticeable improvement in her writing:

[T]his is a thoughtful rhetorical analysis of complex identity issues in which you expand your thinking while wondering where identity lies within each of us. You are heading for success, sophisticated writing and high achievement in this course. You made a lot of progress since your first writing assignment. Bravo!"

In another instance highlighting the importance of the avatar assignment, Dr. Edwards noticed how writing about this gamification feature had promoted positive development in his students' writing. He considered "the mid-term politics of beauty avatar paper as the single most important experience for the group" (observation, April 20, 2017). In an observation toward the end of the semester, Maya said in class:

"My favorite part [of the course gamification] was the avatar paper. The process of creating the avatar, thinking about complex issues such as race and the concept of beauty, all these things made me think and generated many ideas which I used in my writing. Normally, I get stuck with less than a paragraph. I can't believe I wrote an essay on this!" (observation, April 28, 2017)

While such evidence of improved writing abounded in Dr. Edwards's class, improved reading skills were not widely reported. However, Maya reported improved willingness to read in the gamified environment:

In many English classes, we just read and read, and we would write our responses on different readings. But this one was more like a mission or quest. Usually, tests and assignments make me feel stressed, but changing the class assignments to quests made me feel relaxed and read more. (personal communication, May 22, 2017)

Literacy Skills: Dr. Peterson's Class

Dr. Peterson employed gamification to support the two main literacy skills: reading and writing. In addition to data discussed earlier regarding increased task value and task completion as gamification fostered student interest in the reading material, further evidence showed that video game elements positively affected students' reading and writing literacy skills. Aziz, for example, said that the avatar assignment improved his writing skills. "I am used to write [sic] in short sentences, you know, in engineering, you don't need to write a lot. When we had the avatar paper, I started writing multiple paragraphs, like an essay" (personal communication, April 18, 2017). During a session in Dr. Peterson's class, on May 11, 2017, a Japanese student was asked by a classmate his opinion of the use of avatars:

"I like them. This makes me want to write more over [sic] this topic. It is interested [sic] and different from other English class."

Dr. Peterson interrupted "All avatars we have seen so far seem to connect to the future." He projected students' works on the screen, then asked Lee [the Japanese student] for permission to present his avatar paper to the class. He agreed. His avatar showed a serious looking fictional Asian figure in vivid colors against a bright yellow background (Figure 5).

"My avatar has ninjutsu," said Lee. "Powers that can manipulate other people's minds!"

Although the avatar was a work of fiction, the student looked serious about describing his avatar. The rest of the class listened carefully showing interest in the meaning of the Japanese words used in Lee's writing.

Figure 5. Lee's avatar.

"You're casting into another world. It is taken from a historical value set," said Dr. Peterson as the students looked thoughtful.

"It is in my culture," said Lee addressing the professor and looking around occasionally. "I chose my avatar because it struggles to prove its existence overcome [sic] challenges with hard work. I enjoyed writing about this because these are values that many people in my culture share."

Lee's project in creating his avatar not only motivated him to write about a topic of more interest to him than those in his previous English classes, but also to draw on connections to his own Japanese cultural values. The avatar paper functioned to strengthen his writing by enhancing connections to his cultural heritage.

Improved reading skills were reported particularly through the use of quests in Dr. Peterson's class. Quests were incorporated into the gamified quizzes; a digital quiz-like platform in which the students collaborated to answer questions correctly competing against an imaginary virtual beast. Aziz relayed how the game quiz-based quest improved the quality of his reading: "The game quiz motivated me to read more carefully and understand the text to answer the questions correctly" (personal communication, June 5, 2017).

Chloe connected the use of quests to completing the reading assignment Dr. Peterson required of his students: "It would motivate them to read the book." When asked about her personal experience following the use of quests, she said: "It affected me positively because it actually motivated me to read the book" (personal communication, May 30, 2017). Jack emphasized how the use of quests promoted him to read more accurately:

I wanted to win during the game quizzes. We were on a quest to beat the Dragon, and my team was working hard to win. I started reading more carefully looking for details and I actually finished *Longitude* [Sobel, 1995]. Normally, I do not read that much, but this time I felt the need to read. I really enjoyed it!" (personal communication, June 6, 2017)

The game quizzes, where the students had a quest to win a battle against the beast, were designed to test and review students' knowledge of the reading material. Dr. Peterson noted their

effectiveness: "The game quizzes helped many students complete their readings. Many students coming from science background don't like to read novels, but the game quizzes motivated them to finish *Longitude* [Sobel, 1995]" (personal communication, June 13, 2017).

In a similar manner, Dr. Peterson connected the use of avatar to improvement in students' writing using technical English. He also saw the value of this gamification feature in his future teaching repertoire:

> The avatar assignment was a big success. The students were visibly engaged and worked very hard to create and choose their avatars. They had to justify their choices and use technical English writing in describing the steps they have taken to complete their project. I will definitely use the avatars in my future teaching of the English 402 and possibly other courses. (personal communication, June 6, 2017)

Expanded Teaching Repertoire: Dr. Jones's Class

The in-service teachers in Dr. Jones's class experienced the utilization of video game elements in a different fashion from the students in other courses. They evaluated gamification as a tool which they could use in their own teaching practice and were keen on learning the technology to expand their teaching repertoire.

Stephen supported the use of video games in teaching and learning: "Video game elements are wonderful for the classroom. I wish that we had more video games in English language, arts, and history." When asked if the gamified events in Dr. Jones's class increased his knowledge and familiarity with the topic compared to his past experience, he answered:

> I learned a lot in Dr. Jones's class about how video games could be used in teaching. I am more familiar with how to create a gamified lesson for my class. I appreciated

Gamestar Mechanic because I found it very useful online tool to create a gamified content for my teaching. (personal communication, April 28, 2017)

Ray stated similar improvement and expansion in teaching repertoire:

As far as my learning and practicum experience in Dr. Jones's class, the overall experience was positive. I enjoyed learning new teaching skills using technology, especially the use of video games. I feel more confident and comfortable not only with the use of gamification but with any form of instructional technology" (personal communication, April 20, 2017).

Katherine, who was cautious in learning about the use of gamification in the beginning, said that she had become more receptive to its use as she became competent in digital knowledge and skills. She had actually used some of what she learned about gamification in Dr. Jones' class in her own teaching:

I was nervous in the beginning learning about using Gamestar Mechanic in class. But after that, I wanted to learn more because I realized the potential and options technology can offer the kids in schools. As I became more acquainted with how to use the gamified websites, I actually started using ClassDojo with my students. It took me some time and hard work to get used to it. It was worth it. I mean, the level of excitement it generated among my students was amazing! (personal communication April 24, 2017)

Jonathan was the most critical of the use of gamification in Dr. Jones's class. During observations, he cited time, work load, and numerous responsibilities as the main obstacles impeding his learning and experimentation with any new instructional technology, especially gamification. He stated that he had never played video games except once with his nephew and that he preferred spending time outdoors. At the end of the semester, when asked whether his

position toward gamification had changed, he continuously reflected, "In terms of learning, it served as first exposure to these products and tools. I know more than I did. I will have the opportunity to build on these elements if appropriate for my students" (personal communication, April 28, 2017).

For Sabrina, the use of gamification in various class activities had expanded the breadth of her repertoire of teaching strategies, although she did not report new knowledge and skills. Toward the end of the semester, Sabrina noted her expanded instructional planning and her deepened appreciation of gamification's pedagogical value:

"Honestly, I was already familiar with how to use it [gamification] because I used it once in my geography class. It is cool! The students created historical figures representing different characters in the American frontier and started exploring different locations where historical events happened. I still feel that I learned new things [in this class] and I am thinking to expand the way I use it. I am thinking to empower my students to create their own gamified content based on the topic of their choice. I also want to experiment more with Gamestar Mechanic" (observation, April 15, 2017)

Kurtis who had even more experience with gamification before the semester began, was even more enthusiastic about the use of gamification:

I am a professional video game player. I always thought video games can be a powerful tool in teaching and learning. I think they can positively impact the less motivated students. I was really excited to know that Dr. Jones would be using gamification in class. My favorite part was the practicum because it connected what I know and have learned about video games to teaching. This was a learning experience for me. (personal communication, April 24, 2017)

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In Dr. Peterson's and Dr. Edward's classes, the two writing classes, the survey included this item: *The use of video game elements in class helped me improve my reading and writing*, to which 75% of the students agreed. 65% of the in-service teachers agreed that the use of video game elements expanded their teaching repertoire. Multiple regression showed a positive correlation between the use of video game elements and the perception of the students of improved literacy skills ($p<.05$). The standard coefficient showed a positive correlation between the use of video games and literacy skills ($\beta=.421$).

In summary, the use of gamification resulted in improved literacy skills in Dr. Edwards's and Dr. Peterson's classes in addition to expanded repertoire of teaching strategies in Dr. Jones's class. This was shown in a progressive growth in students writing in Dr. Edwards' class, enhanced reading and writing skills in Dr. Peterson's course, and deepened appreciation of gamification as a pedagogical tool in Dr. Jones's class.

Fusion of Learning and Play

Ludic, comes from Latin word *ludus*, has roots indicating three meanings: *play*, *game, school*. This term has been used to refer to the conscious behavior of students in an educational game setting to participate in playful learning activities (Mustaro, Silva, & Silveira, 2011). This usage suggests a strong connection between play and fun as powerful pedagogical tools (Tay & Lim 2011).

Liebermann (2006) posited that the introduction of a challenge governed by guidelines produced a sense of focus and immersion in the task leading to "flow" (p. 282). Csikszentmihalyi (1990) was the first to write of the principle of flow as a state produced through the amalgamation of pleasure, reasonably designed challenges, and choice engaging in play or ludic awareness. Flow or ludic awareness is not a gamification feature but rather one of the

affordances of the gamified environment. Of course, students in the three WSU class did not describe their immersive play experience using words like *flow* or *ludic*, but their repeatedly spoke of *fun* and the antonyms of this word such as *not boring*. The only reference to "ludic awareness" was from Dr. Edwards during an interview when he commented on his students' positive experiences in the gamified events: "They [his students] were playful in the positive sense of ludic awareness" (personal communication, May 31, 2017).

When students' interview script was examined, the word *fun* was mentioned a total of 71 times. Jack, for example, stated: "There was a lot of fun during the gamified activities, but it felt fairly limited about how much gamified elements were implemented in class" (personal communication, June 6, 2017). Similarly, Aziz expressed his feelings of being drawn to participate in the gamified activities because he did not "feel bored." However, he requested the incorporation of more video game elements and technology into the course: "I think if you use more technology; may be use 3D goggles and use virtual reality components; I think this would make it more interesting" (personal communication, June 5, 2017). Chloe echoed this idea of having fun but with some reservations: "It was fun for the most part. The only [negative] thing I can think about is the errors which sometimes show up in the gaming software" (personal communication, June 5, 2017).

Lindsey, in Dr. Edwards' class, justified her preference for gamified options as opposed to non-gamified because "everyone had fun with it" (personal communication, April 24, 2017). Brooklyn specified, "It was fun, and the first time I saw real-time negotiations" (personal communication, April 17, 2017). David explicitly connected fun afforded in the game environment to his enhanced learning: "I really enjoyed the fun element and learned at the same time" (personal communication, May 18, 2017).

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Analysis of the fun component revealed its significant impact in producing a state of immersion in the learning experience in which a sense of time was lost during the process of overcoming challenges. Consider, for example, Brooklyn's detailed statement:

When we did the video game in class, that class went faster than any other class. Everyone was participating, laughing, and having fun. Things went really faster than when listening to Dr. Edwards and thinking what to say. It affected my learning because it was more fun and more enjoyable. The avatar assignment was interesting and the most challenging assignment I did all year. (personal communication, April 17, 2017)

In a similar manner during the observations of Dr. Jones's class, some students expressed their surprise at how quickly the three-hour weekly session went by during the gamified events. Stephen spoke about the fun he had in Dr. Jones's class and the sense of playfulness he sensed in his own students when he transferred what he was learning to his own teaching:

I know that I had fun during the gamified events, making the three-hour class pass so quickly. The best thing about fun of this sort is that it is naturally embedded within class activities, and many of us enjoyed it. My students had a similar feeling when I used game elements in my teaching. The important thing, in my opinion, is to have a purpose for fun; you know, supporting learning. I think this is what we had in Dr. Jones's class. (personal communication, April 28, 2017)

Similarly, Ray saw a connection between the use of fun and learning in the gamified setting:

The gamified activities we had in Dr. Jones's class were a lot of fun. I know that some colleagues did not feel the same way, but I enjoyed them. If we can combine fun and learning for students in the K-12 system, the results could be encouraging." (personal communication, April 18, 2017)

Even Jonathan, who was less interested in the use of video game elements in class, saw the potential of creating fun for the students afforded in the gamified environment: "I can see how much fun this could generate for my students. I may be able to use video games in my instruction. It all depends on my job responsibilities and time." (personal communication, April 28, 2017)

One of the important and noticeable aspects of fun afforded during the gamified experience of the students is the sense of playfulness which spontaneously occurred while engaging in gamification. Dr. Peterson emphasized how fun worked to increase his students' motivation and engagement: "The use of gamification added the fun element to the course. Many students were surprised in a positive way of the use of video game elements in my course" (personal communication, May 20, 2017). Similarly, Dr. Edwards noticed this phenomenon and commented during an interview: "They were playful in the positive sense of ludic awareness" (personal communication, April 28, 2017).

Quantitative data showed the positive perception and influence of fun on learners' motivation and engagement leading to improved learning experience. Survey data revealed that students unanimously thought fun had a positive effect on their motivation to participate and on their engagement in the content of the gamified activities. When asked if fun had distracted them from the learning content in the three WSU courses, more than 80% of the students declared otherwise. Multiple regression analysis showed a statistically significant relationship between fun and motivation ($\beta=.291$, $p<.05$), and that fun significantly predicted engagement ($\beta=.330$, $p<.05$).

The use of fun as one of the gamification affordances lead to increased motivation and engagement in the learning activities in the three WSU courses.

Learning as Meaning-Making in Gamification

Gee (1997) posited that meaning-making originated in the way individuals act, interact, value, and know the digital environment around them. Meaning-making and processing can exist in the digital world outside of language systems. This includes, as Gee (1997) argued, learning through interaction, problem- solving, and evolving beliefs and attitudes afforded in the use of digital tools and technology. Gee (2003) named these various meaning-bearing forms, such as images and symbols, sounds, gestures and objects, as semiotic domains. Gamification affords a digital environment where such forms take on meaning as perceived by students and professors in the three WSU courses.

Gamification was described by many students and by all three professors as an environment. Dr. Jones, for example, described how many students are "immersed" in the game environment (personal communication, January 2, 2017). He argued that the lack of exposure some of his students had to technology as an environment was the main obstacle against their readiness to incorporate it. In a similar language, Dr. Edwards spoke of gamification, and instructional technology in general, as an environment (personal communication, April 28, 2017). Dr. Peterson also discussed the gamified use in his class toward the end of the semester as an "experience" (observation, personal communication, April 28, 2017).

Students in Dr. Jones echoed the same motif, Kurtis saying, "I wish we can have an interactive game environment where the challenge level is adjusted accordingly" (personal communication, April 10, 2017). Jonathan, the oldest student in the class and the most critical of gamification, described gamification as an "environment" and how it can foster beneficial pedagogy:

The gaming environment is a good opportunity to create continuity and increase

engagement. We can do it for a small amount of time every week every time and make it

embedded within a curriculum. One of the reasons I mention continuity is knowing what

the students have experienced and referring to their experiences; providing the link and

the connection between what they have learned and the new target knowledge. (personal

communication, April 28, 2017)

When the in-service teachers had been directed to create a gamified platform of their own,

Katherine appreciated the non-linguistic skills she was acquiring. During an observation on

February 27, 2017, she addressed Dr. Jones:

"I have never worked on creating a game like this for my students. This website makes it

easier than I thought. The skills I learned in this assignment are easily transferrable to my

students. I can see how I can use a game on math to help my students learn critical

thinking and problem-solving."

Jonathan reiterated the idea that gamification's pedagogical use was not as complicated as he

initially anticipated speculating possible future use in his own teaching: "I know more than I did.

I will have the opportunity to build on these elements if appropriate for my students" (personal

communication, April 28, 2017). Dr. Jones noticed the positive change of belief and the

psychological readiness to employ gamification, specifically for Jonathan and Katherine:

When adopting technology, there are some challenges about accessibility and technical

difficulties. Some younger students were more respective to technology. The other older

students did not experience this as they grow up. Some of them question the whole idea

about using video game elements. They are readier to discuss it now. (personal

communication, April 28, 2017)

Ray, in Dr. Jones's class, enthusiastically shared his own experience using gamification with his students "I used my own gamified platform. It was an immersive virtual setting where the students were totally absorbed in the experience learning critical skills at the same time" (personal communication, April 18, 2017). The digital life afforded in the gamified environment, according to Ray, allows the students to assume different roles avoiding peer pressure through keeping their anonymity as in the case of avatar creation.

Another example of establishing cultural connections and finding meaning outside of language is the avatar created by Lee, the Japanese student in Dr. Peterson's class (See Figure 6). He created an avatar that could relate to his own cultural and ethnic background, an animated Asian figure showing strong resolve and determination to overcome challenges. Lee elaborated: "It is in my culture. I chose my avatar because it struggles to prove its existence overcome [sic] challenges with hard work. . . . These are values that many people share" (observation, May 11, 2017).

David in Dr. Edwards' class reflected this idea: "The best thing about the game platform is that you don't learn in the same manner like you do as if you were attending a lecture. I learned more skills during the cultural simulation than in the entire course and many others [courses] I have taken before. Even though they lasted for two weeks, the cultural simulations were the most interesting and most memorable part of the course" (personal communication, May 18, 2017).

Problem-solving skills were manifested in the gamified settings particularly in Dr. Jones's and Dr. Edwards's classes. In Dr. Jones's class, the in-service teachers were asked to use Gamestar Mechanic to identify a complex problem (locally or globally). For example, global warming was chosen by Kurtis as an environmental problem affecting people worldwide. He

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engaged in creating a gamified setting using Gamestar Mechanic where the main character had to

navigate through challenges for global warming, the character's success depended on finding a

resolution for all the challenges presented in the gamified environment. Kurtis commented on

this during an observation on March 9, 2017:

> "I did not think that my skills would allow me to create a problem-solving game which I
>
> could use with my students. This website [Gamestar Mechanic] made it possible, and I
>
> really enjoyed going through the steps and creating a gamified content about protecting
>
> the environment."

Gee (2003) considered establishing the link between digital environment and other

semiotic domains as the fifth principle among his 36 pedagogical principles which could be

drawn from video games. Semiotic domain refers to a variety of forms that take on meaning such

as gestures, symbols, images, and objects (Gee, 2003). In this regard, Maya commented on how

the gamified cultural simulations in Dr. Edwards' class helped students gain skills for their future

professions: "The gamified cultural simulations were a way for us to practice many skills which

we may need in real life and careers" (observation, April 3, 2017). Dr. Edwards also commented

on the authenticity of the gamified cultural simulation he had facilitated in class:

> [One] gamified activity that was particularly effective was the gamified cultural
>
> simulation, particularly the second act where they had a chance to negotiate a treaty.
>
> [Students called this] an intersection with so-called real life. (personal communication,
>
> May 2, 2017)

Raven (1993) showed that traditional assessment methods failed to evaluate some

competencies. His description of these competencies was strikingly reflective of the gamified

cultural simulations in which the students in Dr. Edwards's class engaged in. Of the competencies his students exhibited, Raven reported:

> The students had worked in groups, developed specialized roles and developed the competencies needed to function effectively in those roles. Several students had become good at coordinating the activities of others; others at putting members of their groups at ease and smoothing over interpersonal difficulties. Some gained skills as negotiators. (p. 87)

The competencies Raven observed were almost identical to those developed by students in Dr. Edwards's class. The negotiations between the two groups, the Majorians and Minorians, mimicked real-life negotiations between two nations with disparate economic and political backgrounds. Among the problems the students were required to solve was to reach a treaty of mutual understanding while preserving the sovereignty of each nation. Maya commented on this activity:

> The cultural simulations were my favorite part because we had to think and discuss complex things back and forth to reach a treaty. I liked the gamified interface; each time we negotiated, it was showing emblems of the two nations. Reaching the final treaty with all articles as it was displayed on the game website was both entertaining and educational." (personal communication, April 18, 2018)

A second activity within the gamified cultural simulations was to use the limited material Dr. Edwards distributed to create a symbolic monument representing each nation. This was another example of project-based learning which was presented in the gamified activities as a challenge. Consider Brooklyn's description of this part of the gamified cultural simulations:

> We learned a lot during the gamified cultural simulations. When were given the colored
>
> paper, the scissors, paper clips, and I think we had some tape, we were not sure what to
>
> do with them. Creating an emblem representing our group, the Majorians, needed more
>
> material. At the end, we had an origami of a bird holding clips in its feet, which
>
> impressed Dr. Edwards. (personal communication, April 17, 2017)

The skill Dr. Edwards intended his students to learn was ways to manage limited resources and achieve success while overcoming challenges.

Gee (2003) highlighted the importance of affinity groups in non-linguistic semiotic domains he called *guilds*. Ahmed, the mechanical engineer in Dr. Peterson's class, emphasized how the interaction with classmates facilitated learning and the use of essential skills such as problem solving: "I liked the atmosphere. It was a different learning experience. You know; learning to work together from classmates; learning how to solve problems in the virtual world." Aziz discussed how the presence of many elements in the gamified digital environment helped him stay focused: "Yes! working in groups and the sound effects, the animation and virtual reality elements in the game helped me stay focused" (personal communication, June 5, 2017).

Jack reported that his gamified experience in Dr. Peterson's class had helped him use "critical thinking and problem-solving skills." He added that such skills are frequently used by video game players to advance in the virtual environment: "During the game quizzes in Dr. Peterson's class, I used some of the skills I often use playing video games like solving puzzles and solutions for different challenges" (personal communication, June 6, 2017).

Quantitative data from the survey, supported qualitative data. More than 90% of the students' in the three classes responded affirmatively to this statement: *I used problem solving skills during the gamified settings.* Nearly 70% disagreed that *video games are ineffective in*

teaching and learning. To measure the change of beliefs and attitudes in using digital

technology, an item was added to the in-service teachers' survey: *I developed a positive opinion

of the use of video game elements in teaching and learning*; more than 85% agreed.

In summary, the overwhelmingly positive survey responses supported the proposition

that problem-solving skills could happen using gamification as a digital environment outside of

the language systems. In addition, the positive perception of gamification as an effective

pedagogical tool was also evident based on survey results. Qualitative data, particularly, showed

positive belief transformation specifically in Dr. Jones's class'.

Desirable Behavior Change

Behavioral change important to learning was promoted in the gamified environment of

the three WSU courses. Altruism, increased participation, the positive change in beliefs and

attitudes, and the freedom from atychiphobia or the fear of failure were four prominent behaviors

fostered in the gamified learning environment.

Altruism was promoted through video games. During the gamified events, coming to the

aid of another student who sustained some damage during the game quiz was built in the game

design. For example, in Dr. Peterson's class, there was an option where one hundred health

points were deducted from one team, yet the damage was delayed based on teammates request

allowing for other students to come to this teams' aid (Figure 6). Although Dr. Edwards was

initially reluctant to use points, he did use them in the game quiz to reward altruism. Brooklyn, a

student who received altruism points commented:

> "I am self-motivated and like to study. Still, I like rewards. Dr. Edwards gave me extra
>
> points for helping a student who was absent to understand an assignment. I did not do
>
> that for any points. Still that felt good!" (observation, April 20, 2017).

At the end of the semester, Dr. Edwards awarded some students certificates in recognition of

positive behavior they showed in class. One of those students was Brooklyn (See Figure 7)

Stephen appreciated Dr. Jones's use of points to reward altruistic behaviors and

connected that to his own experience using rewards to encourage or discourage certain types of

behaviors:

I support the use of points and enjoyed gaining them in Dr. Jones' class while helping

Jonathan. I have used points and rewards to address negative behavior in class. If students

are misbehaving, points are taken away from them. Students accept that and can deal with

loss of points as they reflect on that. . . . I reward students for doing positive things to
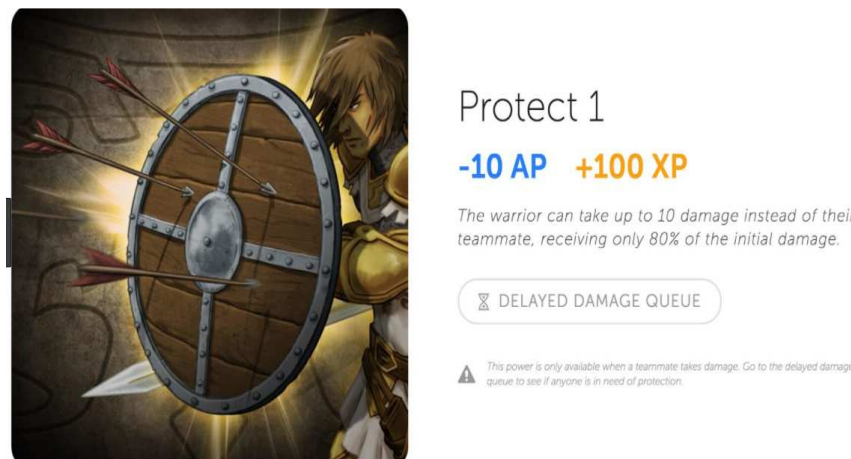
Figure 6. An example of a teammate using his powers to protect others.

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Figure 7. Certificate Dr. Edwards awarded to Brooklyn for altruism.

to balance the loss of points when one misbehaves. (personal communication, April 28, 2017)

Full participation in class discussion and activities is a desirable but elusive goal commonly attained in the three WSU courses where strong participation was observed during gamified events. For example, Ray, in Dr. Jones's class, commented on how gamification had increased the students' participation:
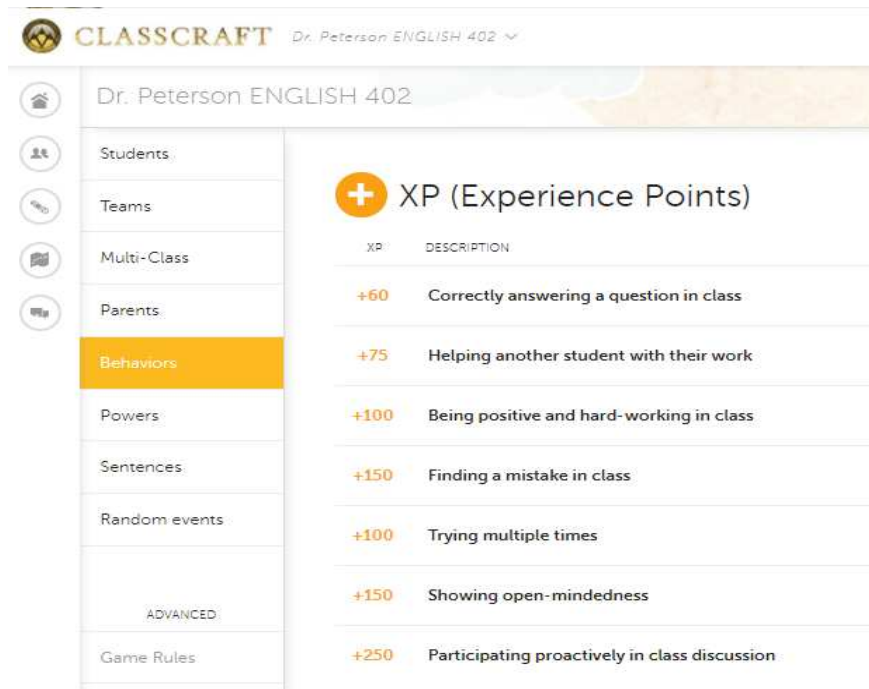
Based on what we had in class, we had to participate more. This is how the gamification in class benefited me. The way the system was set up is that you would gain or lose points based on your participation in the classroom. (personal communication, April 18, 2017)

Similarly, Maya emphasized how gamification enhanced participation: "Everyone enjoyed it and had to participate more" (personal communication, May 22, 2017).

Strongly linked to increased participation is the freedom from fear of trying or atychiphobia. The gamified activity affected the students' readiness to try multiple times whether in answering questions or overcoming challenges. Maya in Dr. Edwards' class stated: "The gamified activities allowed for more opportunities to try again. We [would] just say the answer aloud and not worry about writing this down" (personal communication, May 22, 2017). David, in the same class, explained how the students took advantage of their opportunities and at the same time took this seriously: "We put high stakes on ourselves even though it was not high stakes. We knew we had multiple attempts, so we kept trying to get the answers right" (personal communication, May 18, 2017).

Dr. Peterson utilized the behavior support feature in ClassCraft gamification software to find an error to show the class that correcting them was a rewardable behavior (Figure 8). Making mistakes became more tolerated by students who understood corrections as a learning

Figure 8. Types of behaviors supported in Dr. Peterson's class

opportunity. Chloe and Aziz, both in Dr. Peterson's class, reported that they became more psychologically prepared to make multiple attempts during gamified quizzes, Chloe saying:

Many of us don't feel comfortable embarrassing ourselves in front of the class if we got the wrong answer for example. When I saw everyone else trying and having fun in guessing the correct answer during the game quizzes, I felt more relaxed" (personal communication, June 5, 2017)

Aziz saw a striking contrast between a past unpleasant learning experience he had and his current experience with the gamified quizzes:

I will never forget the teacher who made fun of me in class for getting the wrong answer. This was, of course, overseas in my home country. I still feel hesitation and nervous [sic] to raise my hand or answer because of this. [This class] was the first time that I felt making a wrong answer is OK. Since we had the game quiz, I am more comfortable answer [sic] questions in class. (personal communication, June 5, 2017)

The important arena for behavioral change for the in-service teachers was their own K-12 classrooms. Their use of gamification was exemplified in Stephen's comments on using points to reward or penalize certain behaviors: "I have used points to rewards to address negative behavior in [my] class" (personal communication, April 28, 2017).

His classmate had tried using gamification to encourage desirable behavior change: "I think some positive behavior change could be supported with video game elements. I have seen some of the shyest students in class open up in this environment" (Ray, personal communication, April 18, 2017). Ray noted a general trend among his students toward improved participation and risk taking; not just those who were shy:

The perception of making mistakes and have many lives [in the digital world] increases the students' readiness to participate and their readiness to take chances.

The students may or may not try several times outside of the game environment. In the gamified setting, they are willing to do it. We might not know what the students' abilities are if they don't take a chance." (personal communication, April 18, 2017)

Freedom from atychiphobia could produce risk-taking students or *risk takers* who tolerate failure, prefer to take challenges, self-monitor their learning, and view obstacles as opportunities to create learning strategies appropriate to different tasks (Clifford, 1988, 1991). In the three WSU courses employing gamification, freedom from fear of failing was strongly linked to risk taking and the desire for multiple attempts which could be connected to better learning opportunities for students and in-service teachers as well.

Another change afforded though the gamified settings is the change in students' beliefs and attitudes which was particularly manifested in Dr. Jones's class. For example, Jonathan and Katherine stated that they became more open-minded and readier to discuss the use of video game elements in teaching following the experience they had in Dr. Jones's class. This willingness to use video game elements in the context of teaching reflected a change in their beliefs, although there was little evidence of their engagement and motivation to participate in the gamified activities.

Even among the three WSU professors, there was a positive attitude change. Dr. Edwards was cautious, even skeptical in the beginning of the semester to experiment with gamification and had expressed a negative perception of its potential. At the end of the semester, however, he revealed his intention to incorporate avatars into his future teaching practice, an idea which Dr. Peterson expressed as well.

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Quantitative evidence of attitudinal change was suggested when more than 94% of the students agreed that the use of gamification had positively affected their engagement and motivation leading to increased participation. Similarly, multiple regression showed statistically significant relationship between increased participation in the gamified environment and student engagement (β=.588, p<.05) and motivation (β=.517, p<.05). More than 90% of the students indicated that the gamified settings implemented in their perspective classes had allowed for multiple attempts to try, which supplemented qualitative data evidence that the use of video game elements fostered altruism, increased participation, and risk-taking.

In conclusion, the implementation of gamification in the three WSU courses fostered several positive behaviors important to the learning environment: altruism, increased participation, the freedom from atychiphobia or the fear of failure, and the positive change of beliefs and attitudes.

Effects of Interactivity on Learning

Collaborative Learning: Relatedness

Relatedness in the gamified settings in the three WSU courses was realized through collaboration among the students via team work to enhance discussion and the exchange of information and expertise. In the process, different competencies and skills were fostered. Qualitative and quantitative data connected relatedness to learning in the three WSU courses.

All the students interviewed expressed a preference to work in teams rather than individually, even those who were keen on gaining individual points. Working in teams in Dr. Jones' class was effective in supporting discussion and the exchange of information with

colleagues, which in turn supported learning, according to one student who commented: "I like working as a team because we learn more things sometimes from each other than we learn in class. You know what I mean; we discuss important teaching techniques and we present different perspectives" (Ray, personal communication, April 18, 2017).

Toward the end of the semester, the two most resistant in-service teachers in the class, Stephen and Katherine, joined in playing collaboratively during the game quizzes. One of their classmates, however, continued to prefer individual work throughout the semester: "I realize how important is working in groups in my practice as a teacher. It supports peer discussion and learning. My focus was more on gaining and learning new skills, rather than be a clueless team player" (Jonathan, personal communication, April 28, 2017).

For Jack, in Dr. Peterson's class, working in teams was more engaging as different team members had different roles to play:

> I really wish I see more of that [teamwork]. I think that kind of thing can be more powerful and can be of more presence in the class. We took turns answering questions, but we always discussed [which were] the best answers first. We learned a lot from each other." (personal communication, June 6, 2017)

His classmate acknowledged the contrasting rewards of working within a team and as an individual:

> I think to optimize learning, working within a group would be better, but working individually makes you more inclined to focus and think for yourself. . . . It makes you think through and try harder as opposed to giving up to a group and make other people think about it." (Chloe, personal communication, June 5, 2017)

In Dr. Edwards' class, a student indicated that working in teams had encouraged students to excel, to do "their best effort to get the correct answers" (Maya, personal communication, May 22, 2017). Perhaps the cultural simulations in Dr. Edwards's class provided the strongest manifestation of interactivity and collaboration among the students in his class. The dynamics of interconnectivity were illustrated in Dr. Edwards's class during a two-week gamification event:

> Dr. Edwards explained to his students what cultural simulation stands for in real life. "It is a training for real life scenarios originally developed by a former CIA agent." He went on emphasizing the importance of this for the students' future careers. "You will be future leaders or supervisors, and skills like this prove to be vital."
> Beside promising them knowledge and skills needed for their professional careers, he promised the winning team(s) a badge for expert negotiator and peace-maker. Dr. Edwards divided the class into two groups: the Majorians and the Minorians. In this simulation, the Majorians came from a country called Majoria which had strong economy, technology, and abundant resources. Minorians, as the name suggests, came from a country called Minoria which had long history and rich culture but poor economy and limited resources. Both teams were supposed to achieve agreement in the form of a treaty that would commit Majoria to help Minoria based on mutually-agreed terms. Majorians were given a set of supplies like colored papers, scissors, and tape which they could choose to share with the Minorians and create monuments representing each nation. In addition to the badge, the activity was assigned a number of points to contribute to students' participation grades.
> "You're to consult with your group and the other team to come to common ground," said Dr. Edwards.
> The cultural simulation extended over two weeks and the students were highly interested in this activity. The Majorians evaluated their resources and consulted with each other on what they could offer the Minorians without compromising their independence or hurting their self-pride: "How can we offer them help without insulting them, and what can we get in return from this help," asked Maya as she addressed her teammates in firm tone.
> Outside the classroom, the Minorians deeply engaged in a discussion balancing their need for the Majorians' help and their own commitment to the sovereignty of their country. "We can't expect them to help us with no return," one student said.
> In the second week, students from both groups finalized their agreement in the form of a written signed treaty. Although there was an atmosphere of fun and playfulness, both teams took the acts of the cultural simulation seriously.
> Dr. Edwards rarely intervened. He sat in the back and took notes as the teams engaged in back-and-forth negotiations. As soon as the agreement was finalized, Dr. Edwards waited for the final signing, then played a short animation and awarded the two teams the badge of skilled negotiator and peace maker (See Figure 9). "It looks silly! But it is something to show appreciation of your effort."

Dr. Edwards concluded the class with these remarks. Few students showed reaction to his comments, and some appeared happy to earn the badge. (observation, February 20, 2017)
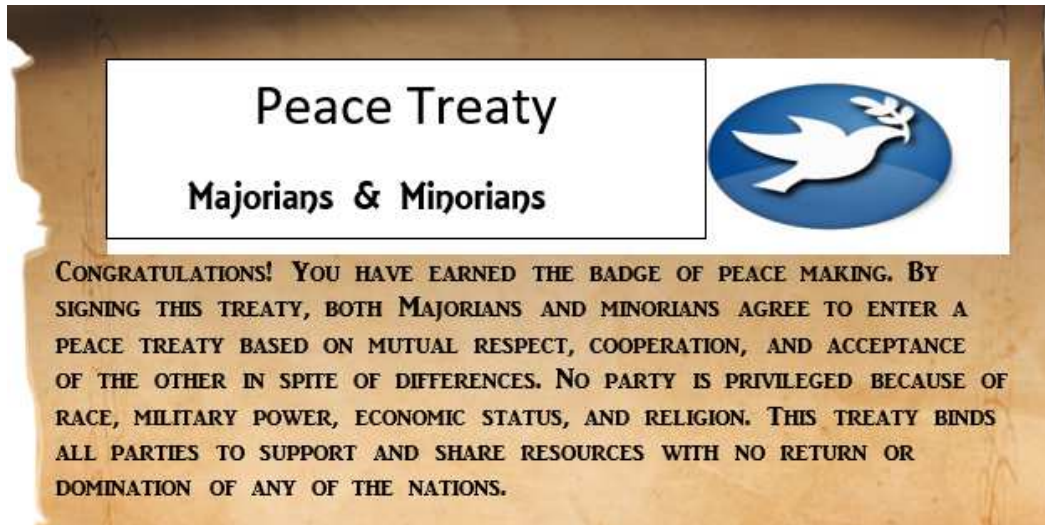
Figure 9. ClassCraft treaty and badge.

This observation is evidence of how gamified events facilitated the relatedness principle through teamwork and strengthened the relationships among students through collaboration. The bridge between theory and practice was demonstrated in the gamification environment where such collaboration could and did happen. Relatedness was embedded within gamification as one of its affordances. Working in interdependent teams to complete game quizzes and to win battles against the Boss was an essential part of the gamified activities in which the students participated.

Multiple regression analysis yielded significant results in correlating relatedness and motivation ($\beta=.370$, $p<.05$). Relatedness also positively predicted engagement ($\beta=.307$, $p<.05$). Student responses showed nearly 80% liked working in teams while fewer than 5% did not, and that more than 80% agreed that relatedness increased their motivation and engagement.

ClassCraft allowed student choice in playing game quizzes individually or in teams. Game analytics and in-class observations revealed that a majority in Dr. Edwards's and Dr. Peterson's classes preferring team play (65%, 75% in quiz one and 73%, 78% in quiz three respectively) (See Figure 10). The in-service teachers in Dr.

Players' Preference Game Quiz1

Teacher	
Dr. Peterson	
Dr. Jones	
Dr. Edwards	

■ Teams ■ Player

Players' Preference Game Quiz3

Teacher	
Dr. Peterson	
Dr. Jones	
Dr. Edwards	

■ Teams ■ Player
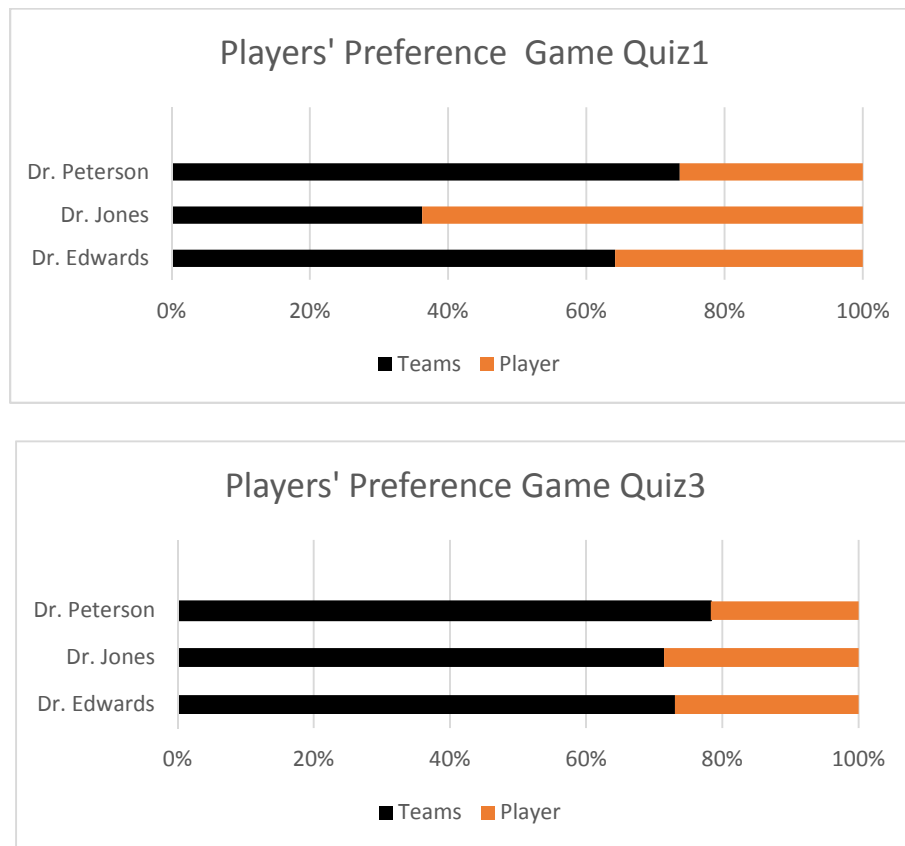
*Figure 1*0. A two-time comparison showing players' preferences.

Jones's class preferred individual play in quiz one but a preference for teamwork in quiz three (35% in quiz one and 72% in quiz three), suggesting that they became more receptive to participating in game quizzes, and more inclined to work in teams.

Bogost (2010) considered the collaboration and interconnectedness to be the most effective component in the video game environment. The data in this study tend to support the essential nature of relatedness as one of the important components in advancing learning. The

gamified events in the three WSU courses moderated social interaction and interconnectedness among the students.

Relatedness, as one of the main component in the self-determination theory, had a positive impact on learners' motivation and engagement in the three WSU classes.

Role-Related Learning

Role-play emerged as a prominent subtheme under relatedness in the context of the gamified events in the three WSU courses. During the gamified quizzes, students were assigned roles and directed to use virtual powers for their designated teams; powers in the form of privileges that students could activate during gamified events to aid their learning. Mages, Warriors, and Healers each possessed different powers, either be game-based, personal, or academic in nature (ClassCraft.com).

During the gamified quizzes, students played different roles and used their powers to help teammates, to delay damage caused by loss of points, to gain extra time for team questions, and to move to from one team to another to enhance discussion. Each team had a Mage, a Healer, and a Warrior and each role had nine different powers (Figure 11). Maya, in Dr. Edwards's class, commented on her role: "In the beginning, I was not sure of my powers. I had the Ardent Faith Healer role. As the game proceeded, I learned I could save a teammate from failing in the game by donating ten health points." When asked about the effect of this role play on her learning, Maya answered:

> Normally, I say what comes to mind when I answer questions. But playing this role allowed me to think about my team members and consult with them on best answers. I learned better when ideas were circulating among my team members than If I was playing solo. (personal communication, May 22, 2017)

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Figure 11. The roles students played during game quizzes

David, in Dr. Edwards's, commented on his role:

> I was given the role of a warrior equipped with Ambush powers. This meant that, during
>
> the game quiz, I could request extra time to discuss possible answers with team members.
>
> I think this worked great giving us the opportunity to learn from each other." (personal
>
> communication, May 18, 2017)

Jack played the role of a Mage who had Teleport powers. When asked about the meaning

of this in the context of the game quizzes, he answered: "The Teleport feature meant that a

Mage, my role, could trade places with any other classmate. So, I would request to switch places

with a classmate from another team and get to participate in their discussion to help answer quiz

questions. It was very interactive and compelling at the same time." (personal communication,

June 6, 2017).

The capacity of roles to promote learning was convincingly manifested in Dr. Jones's

class as the in-service teachers engaged in creating gamified teaching assignments while there

was a continuous back-and-forth shift between the role of students and of teachers. The teachers

were asked to create a gamified assignment using Gamestar Mechanic (See Figure 12) which

they could use in class in their own teaching practice. To test the effectiveness of their products,

the teachers would take turns playing students and interacting within each other's gamified

creations. Using gamified online software, Gamestar Mechanic, simultaneously expanded their

skills, knowledge, and confidence in using gamification. Consider, for example, this part of the

dialogue from an observation in Dr. Jones's class:

> "Do you plan to use this in class," asked Katherine looking at Ray who never moved his face away from the screen.
> "Absolutely! This is fun and learning at the same time!"
> "For me, the best thing about this activity is to experience things from students' perspective," said Sabrina as she turned to face Stephen and Ray.
> Kurtis jumped in, "I agree! I liked the role play. Plus, you learn some game design principles which you could use for math or English teaching," he said in an excited tone.
> "Jonathan," said Dr. Jones as he looked at the corner where Jonathan seemed busy looking at his laptop screen. "It is you turn to play the teacher and introduce your gamified project."
> Jonathan did not seem overly excited about modeling the teacher role for the class but responded, "My gamified project is about educating students about the importance of protecting the environment." Jonathan went on, teaching his lesson as if he was in a classroom. "I want you guys to make sure your ice cubes don't melt all the way by maneuvering your avatar passed different obstacles which stand for global warming causes. Now, who can tell me what global warming is?"
> The teachers acting as students raised their hands and answered, as Dr. Jones smiled and nodded his head. (observation, February 27, 2017)

Close analysis of this activity in Dr. Jones's class, suggested that the teachers recognized an

intrinsic value in role-playing to promote learning in the gamified environment.
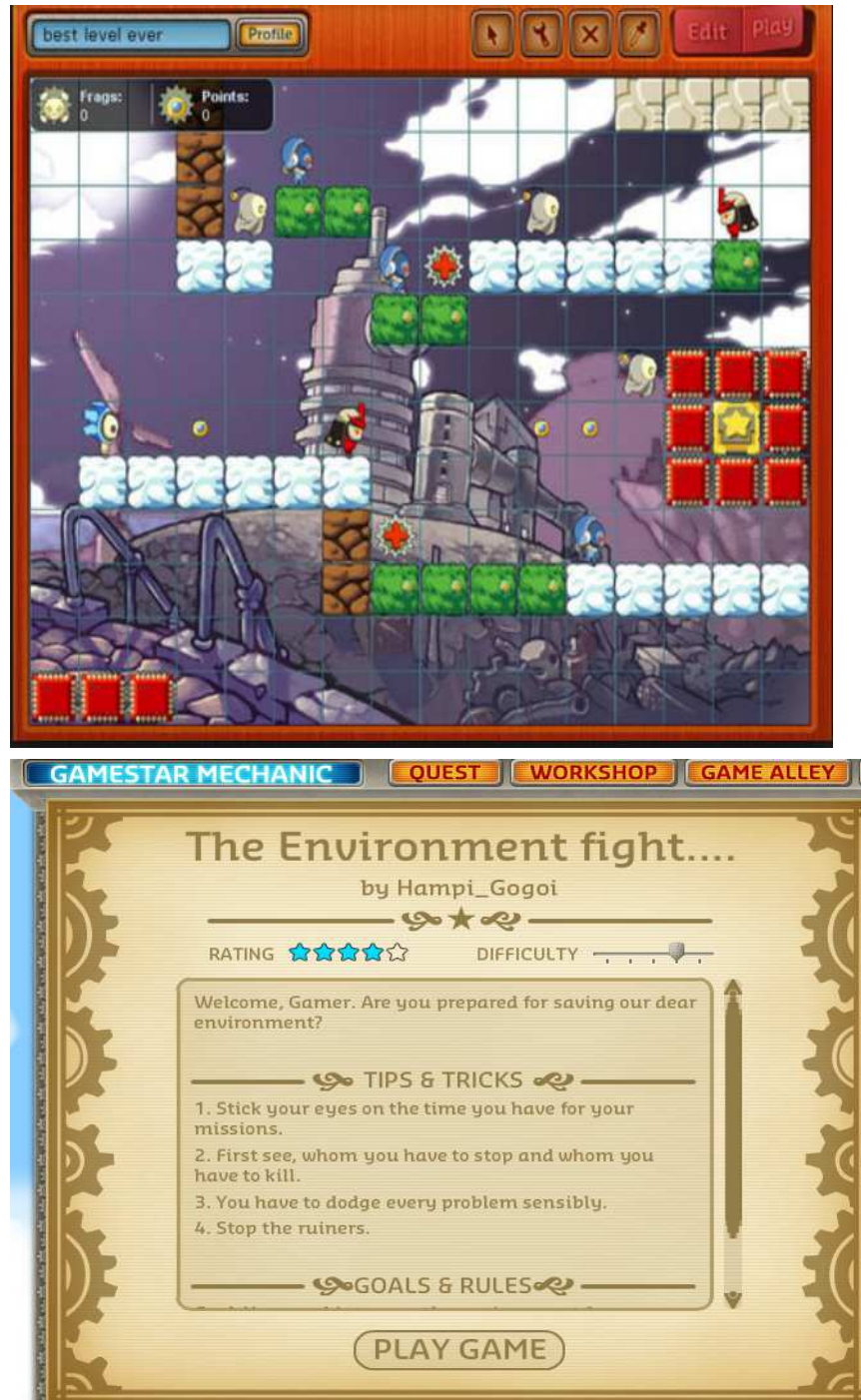
Figure 12. A gamified platform on the environment using Gamestar Mechanic

Quantitative data showed similar results where role play significantly and positively predicted

motivation (β=.258, p<.05) and predicted engagement (β=.575, p<.05). When asked if the use of

role play supported their learning experience, more than 90% agreed.

Role playing, an affordance of gamification, supported learners' motivation and engagement and created opportunities to learn interactively and, in the case of in-service teachers, versatile environment for expanding their teaching strategies and knowledge.

Competitive Interaction

In educational theory, as Rich (1998) posited, not all competition thwarts collaboration and produces such negative results as stress, struggle, and rivalry. Competition in education is fundamentally productive when it supports "full use of one's abilities, ensures that benefits and burdens are more fairly allocated, dispels apathy and stagnation, leads to higher standards . . . [and] promotes progress, and stimulates advancements in science and other fields" (p. 1). He argued that competition is well-rooted in American culture and is used in some instances to maximize the effort one exerts in *competing with oneself.*

In the game environment, Maya described how competition promoted collaboration in teamwork to "compete against the game" (personal communication, May 22, 2017). ClassCraft game design incorporates collaboration to battle against a virtual beast rather than each other by answering questions correctly. Maya elaborated on how competition encouraged collaboration and a sense of belonging to a group:

> I really liked competing against other teams because it motivated us to work harder. If
> two or more people work together, they can kind of reason their way through it. I like
> competing and winning. (personal communication, May 22, 2017)

Some students, including David in Dr. Edwards's class, cited the competitive gamification environment as the chief reason for their positive learning experience. David commented:

> I am a competitive person, and, with the gamified activities, I wanted to do well. I wanted
> my team to do the best that we could and beat the other teams during the battle with the

boss that we were going against. What helped me learn was the fun and the competition.

(personal communication, May 18, 2017)

Based on Bartle's Test of Game Psychology (1996), many gamers are *killers* (who love to compete and win against other players). Students who play competitive video games may be especially inclined to compete in gamified educational settings. This appeared to be the case for many students during observations and interviews. Jack, for example in Dr. Peterson's class, commented: "I was really engaged to participate and make my team win against the beast" (personal communication, June 6, 2017).

Quantitative data provided further evidence of the positive impact of competition on learners. Nearly 80% of the students indicated that competition during gamified events positively affected their engagement and motivation and multiple regression yielded a significant relationship between competition and engagement (β=.275, p<.05) and between competition and motivation (β=.2.39, p<.05).

The use of video game elements in the three WSU courses allowed for positive competition for many students which fostered collaboration and generated an energy to maximize one's best effort.

Effect of Context: Factors in Gamified Learning Opportunities

The differing characteristics of the three courses that served as research sites produced variations in student learning opportunities and interacted with the level and type of gamification implementation. Variations as to instructors, students, course content, ClassCraft score means, and game-quiz-score means were all important in understanding the effect of the context.

Variations Among Sites: Instructors and Content Areas

In Dr. Edwards's class where course content focused on writing, avatars were a key gamification feature supporting the goals of the course. The belief system of the professor also involved valuing the avatar assignment to produce and explore rhetorical, cultural and racial representations to fit his values and the course focus. Critical of points and badges, however, Dr. Edwards used them only in a limited way. He used points in few instances to reward altruism and, in another instance, used badges at the end of cultural simulations. He was more willing to use quests which he utilized in cultural stimulations:

> Following the pilot study the previous semester, I became more inclined to use quests and avatars, as I felt they were compatible with the content of my course in English rhetoric. As far as point and rewards, I am not as excited in using them except possibly in a limited form during the game quizzes. (personal communication, January 12, 2017)

In Dr. Peterson's, course content focused on technical English writing. Less resistant to the use of points and badges, Dr. Peterson, nevertheless, stated reluctance to utilize points fully because he did not consider them compatible with the nature of writing as a progressive activity. However, he considered game quizzes to meet his objective to promote and improve the quality and quantity of his students' reading. Many students confirmed that his goal was successfully met as well. Toward the end of the semester, his plan to continue to use gamification signaled its convincing ability to support learning goals through motivation and engagement:

> I appreciate the potential of gamification in increasing students' motivation and engagement. I speculate that the game quizzes will work well supporting the reading assignments. The same thing could be said about using avatars as a thought-provoking

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source for technical English writing. As far as points go, I think I might use them with discretion. (personal communication, April 24, 2017)

Of the three professors, Dr. Jones began the semester with less skepticism and a more positive perception of the use of gamification in a pedagogical context. He was more welcoming and more flexible in including gamified activities in the syllabus of his course, and he provided multiple online options for the avatar assignment. He also empowered his in-service teachers to create gamified lessons of their own, and accepted students' criticism of some aspects of the gamification he used. Early on, Dr. Jones expressed enthusiasm:

I am all for using instructional technology, whether gamification, augmented and virtual reality, or other settings. I think instructional technology will optimize learning. Teachers should not think of it as a distraction from teaching and learning but rather a tool supporting their goals. (personal communication, January 18, 2017)

Individual differences in the past experiences and backgrounds of the three professors regarding instructional technology strongly influenced the extent and type of gamification they implemented in their courses. Dr. Edwards's limited experience contrasted with Dr. Peterson's greater experience, using quests for example, explained the latter's willingness to apply and experiment with game features. In comparison to both of them, Dr. Jones had firsthand experience using ClassDojo and other gamified platforms and enthusiastically embraced gamification in his course, using much more of it.

Gamification proved to have sufficient versatility to allow the instructors to choose the most effective and relevant video game elements and to adapt them to the course content and objectives, tailoring to the needs of their students who also displayed contrasting characteristics.

Student Willingness and Experience

Students in Dr. Edwards class were all honor students capable of exceptional academic performance. Close observations and student interviews revealed that many were conceptually and psychologically ready for the gamified events Dr. Edwards had created. David, for example, observed during his first exposure to the course's gamified aspects, said eagerly: "I can connect to this. I grow up playing video games and this is a new way to take an English quiz." (April 26, 2017). His classmate, Brooklyn, who had experienced her elementary teacher mother use ClassDojo in her teaching, also had positive past experience: "My mom teaches at an elementary school, and she has used video game features in her teaching . . . you know, ClassDojo. So, I feel open-minded about Dr. Edwards using it in class" (personal communication, April 17, 2017).

Other students in this class who described themselves as self-motivated, did not respond positively to such extrinsic motivators as points and badges, but appreciated other more authentic elements of the game experience, such as teamwork and quests. For example, Lindsey said: "I am willing to play as a team. I am a social person and I feel totally comfortable in this environment" (personal communication, April 24, 2017).

In Dr. Peterson's class, many international students seemed hesitant to give their opinions of the gamified events and linguistic and cultural barriers affected their readiness and willingness to get involved in the gamified settings. For example, Lee and two other Asian students were the last to sign consent forms permitting class observations because, as they explained to Dr. Peterson later, they thought it meant they must also participate in interviews with the researcher. When the consent form was explained to them, they signed but never agreed to be interviewed.

International students from Middle Eastern countries are noticeably diplomatic in their comments (Derderian-Aghajanian & Cong, 2012). For example, when asked by Dr. Peterson

how he felt about the use of video games, Hani, a student from Kuwait, answered: "I don't think it is a problem for me." When Dr. Peterson rephrased the question, Hani added: "They are good." (observation, March 28, 2017). Only two Middle-Eastern students agreed to be interviewed, and they insisted to know the interview questions in advance and prepared their answers ahead of time, leading to a strong impression that their comments were not spontaneous.

In Dr. Peterson's class, 22 out of 25 students appeared engaged and motivated to participate in the gamified settings. The two students who were visibly disengaged, Dr. Peterson's said, followed the percentage of the students deemed to be so in every class setting. The others were observed playing video games regularly on their digital devices before, after, and sometimes during class time. Their experience with video games translated to an inclination to participate in the gamified settings in Dr. Peterson's class.

Dr. Jones's class was exceptionally significant, for this research, because the focus was on the pedagogical potential of gamification and common challenges in its classroom implementation such as time, workload, and children's background. In Dr. Jones's class, student background and experience varied with gamification to a great extent. Between avid video game players such as Kurtis, and those with little or no exposure to video games such as Jonathan and Katherine, there were in-service teachers who had used video game platforms in their teaching and had first-hand experiences with their applications. Many of them had used ClassDojo, a gamified class management system, in their teaching practicum and practice. Kurtis, for example, was uniquely disengaged during most observations except those involving gamified activities. Jonathan, who described himself as an outdoor guy, seemed the most resistant to using video game elements in a pedagogical context. Katherine was less resistant but cautious in using the gamified alternative.

Variations in the characteristics of the three class instructors, course content, and students were reflected in the game scores recorded through ClassCraft. The score means were highest in Dr. Peterson's class. Similarly, game quiz score varied among the three courses with those for Dr. Jones's being the lowest. These numbers suggested that students' strong game background in Dr. Peterson's class reflected on their level of participation and interaction with the gamified events as contrasted to the in-service teachers who had less exposure and experience. In Dr. Edwards's class, students positively received the use of gamification but not to the level of those in Dr. Peterson's which reflected on their ClassCraft and game quiz scores.

During interviews, game analytics were shared with the students and in-service teachers to get their responses. When asked about her opinion of the low game scores she had in Dr. Jones's class, Katherine responded: "It is not because I was disengaged or anything like that. I was trying to figure out the game rules and experiment with the gamified applications. I was curious how it worked and its different potential" (personal communication, June 6, 2017). For Jonathan, the game analytics accurately reflected his state of hesitation and cautiousness with the use of gamification: "I am not really into video games or points. I was trying to understand the way gamification work rather than win a competition. I think the chart shows my caution to experiment with a new technology" (personal communication, April 28, 2017). Game analytics should not be used as a sole measurement for drawing conclusions because it could simply reflect lack of activity or low score due to absence as in the case of Stephen (personal communication, April 28, 2017).

Game analytics in Dr. Edwards's and Dr. Peterson's classes reflected a majority who were interested in the gamified activities. David, when asked about his high game score, answered: "I think it mirrored my interest in the game. I play video games a lot and I like to see

my name high on the leaderboard" (personal information, April 26, 2017). Other students, such as Brooklyn, did not keep records of their game score but appeared to agree with it: "I did not know that [high game score]. I know that I was really engaged and I tried to help my team beat the monster first. I remember getting extra points for helping a student in class. I really enjoyed it. It was a lot of fun." (personal communication, April 17, 2017). Language proficiency for Aziz in Dr. Peterson's class reflected on his game score: "In the beginning, I did not understand the questions, so I answered some of them uncorrectly [sic]" (personal communication, June 5, 2017). For his classmate, game analytics corresponded with her inner motivational need to excel and achieve status: "I really wanted to win. So, I think this chart is accurate in representing my activity during the game" (Chloe, personal communication, June 5, 2017).

Whereas the in-service teachers were more focused on the learning and teaching aspects of gamification, students in the other two classes appreciated winning and competing. This could explain the relative low mean scores the in-service teachers had. These results become important only when in support of the previous qualitative data and are not enough to draw overall conclusions about the determining effect of the context.

Variations in the scope of gamification implementation, the gamification features employed, the instructors' background and experience contributed in shaping the perception of the students of the use of video game elements in the three WSU course contexts. Variations in the students' readiness to participate in the gamified events, their personal prior experience playing video games, in addition to their psychological inclination to engage or interact in gamified activities may have influenced their overall perception of the use of gamification in the three WSU courses.

Differential Learning Opportunities

Data analysis included attention to both possible and enhanced opportunities in the three WSU courses owing to instructor, content, and student differences. In Dr. Jones's class, with his announced enthusiasm and open mindedness to use gamification, the in-service teachers were exposed to many video game components and encouraged to use them in their teaching practice. Sabrina testified to unanimous benefits: "The general impression for all of the in-service teachers, I think, is that we know more than before, and we have more tools to use in our teaching practice than before. I certainly learned a lot about the use of gamification and its potential" (personal communication, April 20, 2017).

The possible benefits of gamification in a pedagogical context varied, however, depending on age, exposure, and willingness. For Jonathan, the oldest in-service teacher, the immediate potential of gamification was not recognized although future use became a possibility. Katherine, with little exposure to gamification, exhibited a transformation in her attitude toward the use of video game elements from resistance to experimentation in her own teaching: "As I became more acquainted with how to use the gamified websites, I actually started using ClassDojo with my students." (personal communication April 24, 2017). The younger in-service teachers such as Stephen, Kurtis, Ray, and Sabrina with more experience and exposure to using gamification, showed a higher willingness to experiment further with its pedagogical potential.

Dr. Jones' science education background and his experience with the use of gamification allowed better opportunities for his in-service teachers. He not only used ClassCraft but Gamestar Mechanics requiring his in-service teachers to model a gamified lesson. These variations created more learning opportunities with pedagogical focus for the in-service teachers in Dr. Jones' class.

Dr. Edwards's conservative and selective approach to using gamification affected his students' perception of its use. Dr. Edwards' open comment about badges as "silly" and his beliefs about the reward system may have shaped his students' perception and level of exposure to these gamification features. Following his comment, some students were indifferent to receiving the badge while others showed some excitement (observation, March 7, 2017). What was missed in Dr. Edwards's class as a result of his beliefs about some gamification elements was the full evaluation of gamification use and its potential in enhancing motivation and engagement and, consequently, improving student learning opportunities. The connection between the reading material and the game quizzes Dr. Edwards designed was not direct. Many of the questions he created in the game quizzes were general or philosophical in nature. When students answered questions during game quizzed, Dr. Edwards would open discussion about answers delaying the pace of the game and raising discontent among some students: "[The answers for the game quiz] needed the professor's approval. It slowed everything down!" (Brooklyn, personal communication, April 17, 2017).

Not all learning opportunities were missed in Dr. Edwards' class. His focus on the English rhetoric through the avatar papers, and the gamified cultural simulations supported students' writing and communication skills and enhanced the learning opportunities for his students. There was nothing similar to the gamified cultural simulations Dr. Edwards created in the other two classes to support competencies such as negotiations, cooperation, and critical thinking.

The self-motivated semi-homogenous group (mostly coming from upper-middle class White families) in Dr. Edwards reacted largely indifferently to the limited use of points and badges but many stated a desire for recognition and status. This is especially true for Brooklyn

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who showed excitement at receiving altruism certificate and rewards: "I am self-motivated and like to study. Still, I like rewards. Dr. Edwards gave me extra points for helping a student who was absent understand an assignment" (personal communication, April 20, 2017). For her classmate, David, competition enhanced his learning opportunities:

> I am a competitive person and with the gamified activities, I wanted to do well. . . . What helped me learn was the fun, the competition. The games that I had during my Spanish classes always helped me learn. It was unique in the English class because I never played games like this before . . . I really liked it. (personal communication, April 20, 2017)

In his feedback to students, Dr. Edwards used words like "growth," "progress," and "improvement" suggesting that the use of video game elements enhanced his students' writing skills.

Enhanced opportunities were evident among the international diverse group in Dr. Peterson's class. Improved literacy skills in reading and writing accompanied high levels of engagement and motivation among this group with high exposure to video games. Students, such as Aziz, Jack, and others, repeatedly emphasized the positive learning experience they had had in Dr. Peterson's class with the use of video games. Dr. Peterson used game quizzes not only to check students' understanding of the reading material, but also their knowledge of grammar. Based on his international students' request, he used the gamified platform during quizzes to explain the difference between a clause and a phrase "It [grammar] will be more interesting with the game quiz" (personal communication, May 19, 2017). Ahmed commented on his experience learning grammar in Dr. Peterson's class: "I have never learned grammar like game. This is so much fun" (observation, May 26, 2017).

The contextual differences in the three courses caused variations in the learning opportunities afforded through the implementation of gamification. Dr. Edwards' preference for some gamification features, his use of the cultural simulations, and his focus on English rhetoric supported the growth and development of his students' writing. Dr. Peterson's fostered different learning opportunities using gamification to enhance his students' knowledge of grammar and support reading skills. Finally, Dr. Jones' in-service teachers benefitted to different degrees from the gamified technological tools he used expanding their knowledge and teaching repertoire.

In summary, this chapter covered four main themes regarding the effects of gamification on students' motivation and engagement, learning, interactivity in learning, and finally how these effects on learning opportunities were moderated by different site characteristics.

Of the different game features, avatars and quests proved most effective, while rewards in the form of points and badges had either negative effects or were ineffective for many students. Across all sites, fun and play were significant in motivating and engaging students in learning activities leading to task completion. Motivational needs based on self-determination theory (SDT) were largely met through the use of gamification. These include the freedom to make choices in the game environment, the desire to achieve success, and connecting with others through teamwork.

Learning as meaning-making was facilitated in the three gamified environments through the promotion of critical thinking and authentic skills. These skills involve analyzing, evaluating, and interpreting information and applying creative thought to form an argument, solve a problem, or reach a conclusion. Examples of these are the gamified cultural simulations in Dr. Edwards's class, the gamified creations and practicum in Dr. Jones's class, and the gamified

quizzes in Dr. Peterson's class. Desirable non-academic behaviors were supported such as altruism, participation, and positive change of attitudes and beliefs.

Gamification fostered collaborative and cooperative learning opportunities for the students through relatedness, teamwork, role play, and positive competition. Variations in course content, instructor characteristics, student experience and exposure to video game elements, affected the level of implementation of video game elements and sometimes created constraints limiting their use.

Findings

Gamification contributed mightily to creating learning environments conducive to improved writing, higher quality and quantity in reading assignments, and increased appreciation of gamification as an educational tool. Fun and play increased motivation and engagement in the learning activities in all of the three WSU courses along with increased appreciation of tasks. Gamification promoted students' engagement in all three courses by enhancing their focus on tasks and task completion. In a similar manner, gamification supported learners' motivational needs of autonomy, competence, and relatedness.

Role-playing created opportunities for the students to choose possible future and second identities which are fertile for creative writing and, in the case of in-service teachers, versatile for shifting the teacher-student hats. Role-playing was manifested through the use of avatars, cultural simulations, and teacher practicum. The use of video game elements in the three WSU courses allowed for positive competition which fostered collaboration and generated energy to maximize one's best effort.

Vital and authentic skills essential to learning such as critical thinking, communication, and negotiation were supported through the use of gamification. The implementation of

gamification in the three WSU courses fostered several positive behaviors important to the learning environment such as altruism, increased participation, the desire to try multiple times, and the positive change of beliefs and attitudes, especially for the in-service teachers. Gamification enhanced collaborative and cooperative learning through relatedness in all three courses.

Quests and avatars were the gamification features which best corresponded with high interactivity level, responsiveness, in addition to increased motivation and engagement, while rewards not only undermined students' motivation, but they also negatively affected their engagement.

Finally, variations in site characteristics, instructor and student backgrounds relevant to gamification use and exposure dictated the type and level of implementation used in the three WSU courses, and consequently enhanced or reduced the learning opportunities of the students. These variations also influenced students' perception of the gamification features employed both positively and negatively. While Dr. Edwards's negative perception of rewards created an adverse perception of their use among some students, Dr. Jones's readiness and support of gamification positively influenced many in-service teachers. Dr. Peterson, being less resistant to gamification than Dr. Edwards with students more familiar with video games, created an atmosphere highly supportive of video games option and greatly enhanced their learning opportunities.

CHAPTER FIVE

CONCLUSION

Implications of Gamification Praxis and Recommendations

One of the main implications of this study is strongly connected to the availability of research sites where gamification is implemented. The struggle and difficulty of finding and securing a teaching environment where gamification is implemented reflected the lack of its implementation and the lost opportunities of understanding its effect in a pedagogical context. It also showed the paucity of empiricism and the neglect (despite the promise) of gamification in public schools and the college environment. In the early stages of this research, securing research sites was largely unsuccessful. When approached about the possibility of implementing gamification, some instructors, especially in Washington State University- Department of Agricultural Sciences, were concerned that gamification might compromise the content of their courses, despite the researcher's assurances and multiple attempts to change their mindset. Losing hope to find a gamified course in Washington State university and the University of Idaho, I started emailing a K-12 teacher in the New York area of the possibility of doing research in her classroom. She was supportive and excited about the idea which seemed very plausible had not been for the geographical and logistic obstacles. The struggle finally paid off with two WSU-Pullman campus professors and another in the Tri-Cities campus agreeing to gamify their courses.

Another implication of this study supported Deci, Koestner, and Ryan (2001) research which concluded that extrinsic rewards have been found to undermine intrinsic motivation. Although the findings and the interpretations of this study are site-specific, they become particularly important when the data produced confirms previous research. Not only the data of

this study supported Deci, Koestner, and Ryan (2001) research, but it also extended it shedding

light into the need for proper game design that take into consideration the motivational needs of

the students. Poorly designed reward system could cause skepticism not only on the part of the

learners, many of them are gamers, but also the instructors.

Kolb (2015) outlined four principles necessary in any successful pedagogical gamified

design. First, she recommended that the learning objectives be well-stated and explicitly-

presented prior to engaging gamification elements, and preferably embedded within the

gamified design. Second, she highlighted considering practical steps when applying

gamification design in the learning environment, such as the use of reliable gamification

software making the full employment of gamification features possible. Third, game designers

and educators, according to Kolb (2015), need to prepare quests to increase motivation and

engagement. Fourth, the gamified design should allow for modding (shortened from

modification). Modding, in a gamified context, means to allow users to make their own game

choices. Students need to be empowered to choose their own avatars, create quests, and decide

to engage the gamified content individually or by working in teams.

Kolb's (2015) four principles seemed to be realized, to an extent, in the context of the

three WSU courses where gamification was implemented Gamification was integrated into the

syallabi of the three courses without comprimising the learning outcomes or objectives. In the

case of Dr. Jones, where instructional technology was the main theme, the use of gamification

was strongly linked to the course content. All three profesors used ClassCraft, GameStar

Mechanics, and other avatar-construction online tools for their gamified assignmnets. Except

for some online avatar-creation sites, the selection of dependable gamification sites in this

study met Kolb's (2015) princinple. The game design, as evident in the three courses, allowed

for autonomy manifested through Kolb's (2015) modding. The students were empowered to create and choose their avatars, particularly, in the avatar-writing assignmnet. The in-service teachers enjoyed maximum autonomy creating their gamified assignmnets as part of their teacher practicum.

One of the implications of this study is the importance of integrating gamification into the teaching content making the learning outcomes clear not only to the instructor but also to particpants. Kennedy and Allen (2017) emphasized the importance of having clear objectives to gain the appreciation of the participants. This study showed that for gamification to be effective, students need to be active particpants in its design, logic of implementation, and the learning outcomes. The study included testimonials of students critiquing game design elements, the reward system, and, occasionally, the way the professors handled the game quizzes. One of the techniques Dr. Edwards used in the beginning of the semester, and appeared to gain some level of confidence among his students, is the thorough analysis he presented of the course syllabus and the connections between the use of gamification and the course objectives. Kennedy and Allen's (2017) proposition put the use of gamifcation into perspective in terms of addressing the mindset of the audience. The need to activate gamification around learning objectives is pedagogically essential to the needs of the students. When engaging video game elements in the learning environment, well-defined instructional goals need to be taken into consideration.

Another implication of this study is related to the connection between learning and play. Learning through play does not mean that the learners are unconsciously learning through what is called *stealth learning* (Kapp, Blair & Mesch, 2014). They elaborated that gamification works as a catalyst to discuss key learning points which should be clearly and explicitly stated and not require the learners to struggle to figure them out. The learners, they added, should be told about

what they will be learning and should be asked about what they learned. In this study, most gamified activities involved the conscious decision of the participants to learn and experiment with the use of gamification. This is especially true for the in-service teachers who, for many of them, had used gamification previously in their own teaching and were psychologically ready to reap its potential. For many of them, mastering gamification design was important for their own students in K-12 settings.

An implication of this study is that gamification is likely to be an effective tool for instructors to boost learners' interest and motivation. Gamification as implemented in these courses fostered three environments where the motivation of the students led to strong learning outcomes by meeting the need for competence, autonomy, and relatedness. As a possible alternative to didactic methods of teaching, gamification proved capable of engaging learners, suggesting potential benefits for underperforming or disengaged students.

Kapp, Blair & Mesch (2014) stated that there are a number of reasons to engage gamification successfully into the teaching and learning practices: First, gamification has to be used in a way which allows for creating interaction and interconnectivity among the learners. Second, it has to foster motivation and promote engagement in the learning activities. Third, it has to facilitate the execution of critical thinking skills. Fourth, it should invite a positive behavior change in the learners. Fifth, authentic learning activities have to result from the successful integration of gamification. To provide a thorough evaluation of the use of gamification in the three WSU college courses, the above five reasons should be discussed in detail.

During the observations, interviews, samples of students writing, and quantitative sources of data, the positive experiences of students working in teams was a common motif. Most

students who were asked about their preference of working individually or working in teams chose collaboration. Even among students who emphasized their need for recognition and their desire for achievement, teamwork was prioritized as in the case of, among other students, Brooklyn, Jack, and Chloe. Multiple regression analysis showed statistically significant relationship between increased motivation and relatedness or the desire to connect with others and work in groups (β=.370, p<.05).

When surveyed, 75.6% agreed and 6.7% strongly agreed that they were motivated more to work in teams as compared to working individually. However, teamwork had an insignificant relationship with students' engagement possibly for reasons irrelevant to students' positive perception of the benefits of working cooperatively. These that might have negatively affected learners' engagement while working in teams include technical difficulties, lack of choice in avatar-creation software selection, game-design elements, and unclear instructions on engaging gamified tasks.

In reference to the second reason in Kapp, Blair & Mesch's (2014) list, Gamification successfully increased students' overall motivation and overall engagement in the learning activities which featured gamified events. Strong testimonies by the professors support this finding. This increased motivation and engagement was manifested in two main realizations: increased task value and time on task. In the case of Dr. Peterson and Dr. Edwards, the increased task value was represented in genuine interest in English writing and increased reading. The increased task value in Dr. Jones's class was in the actual use of gamification in pedagogical applications.

Enhancing critical thinking skills, the third reason on Kapp, Blair & Mesch's (2014) listed, were supported in many of the gamified assignments the students created or participated

in. For example, in Dr. Jones's class, the in-service teachers created their own gamified platform using GameStar Mechanics which they could use in their own teaching. Inventing, evaluating, experimenting, and executing were all valuable critical thinking skills they engaged in during this activity. In a similar manner, assessing the avatar-creation tool and searching for alternatives demanded the use of critical thinking skills for students in both WSU classes. Engaging the game quiz and referring back to the reading assignment to draw conclusions was an effort which allowed for the utilization of critical thinking skills.

Positive changes of behavior, the fourth reason Kapp, Blair & Mesch (2014) listed for the justified use of gamification, was discussed in detail in the data interpretation section under behaviorist influences. It was concluded that the use of gamified activities increased students' commitment to do the required readings, changed their beliefs about the task value of gamification as an instructional tool in Dr. Peterson's class, increased participation as in Ray's testimony, and the opportunity and determination to try multiple times without the fear of failing. However, some types of positive behavior rewarded in class such altruism or punctuality can be verified as a positive *change* of behavior. This could be researched in independent mixed - method study researching the effect of gamification before and after or in comparison groups.

Authentic learning activities or products should be one of the benefits of the successful integration of gamification according to Kapp, Blair & Mesch (2014). They posited that authentic learning activities are the ones which could be transferred and linked to real-life skills and scenarios. Not only had the gamified cultural simulations achieve this based on the testimony of Dr. Edwards and his students, some of student-teachers in Dr. Jones's class provided statements in support of this from their own teaching experience.

There are three additional important components that lends themselves for successful gamified experience: integration, well-established connection to the learning objectives, and well-balanced game design. Integration was highly emphasized by Dr. Edwards during the interview with him based on his experience of implementing gamification in his course:

The question of integrating all the gamified components, the questions of frequency, and the interconnectedness of the different elements with each other is probably the crucial issue. There should have been more integration. I should have worked harder presenting the politics of beauty paper and the simulation. Without any work in that direction, people might say that if these were the two gamified elements of the course, what is their relationship to each other. They have a relationship, but I certainly did not talk about it. I think that is what I would connect next time. (personal communication, May 11, 2017)

Finally, designing well integrated gamification components should not only meet the learning goals but also have well-designed game elements. This require planning as Dr. Fred said during an interview with him. If a gamified event is not well planned and is balanced in terms of game design, the results can be negative. Faulty game design as which was partially present in the game quizzes Dr. Chad created allowed the Boss to sustain damage and defeat the competing teams multiple times to the great disappointment of the students. Jack specifically was outspoken about this game design flaw:

The results of this study implied that all gamification features should not be implemented as a package, but rather game features need to be selcetively used based on their efficacy and applicability to the learning environmnet in additional to contextual factors. Integration of the gamified framework with the learning content is critical as the relative experience of two professors in this study suggested. In addition to content integration, their data suggested that

organization and logical justification for video games use in various course activities and assignmnets need to be aligned. The recommendation to activate gamification around learning objectives is pedagogically essential to the needs of the students. Engaging video game elements needs not to be on the expense of well-defined instructional goals.

The final implication in this study is that the use of gamifcation created a game-like atmosphere where many game features were employed working differently from game-based learning. Students particpated in this atmosphere knowing that this environment is not a game with a beginning and an end, but rather an ongoing process extending over the course of their classes. This connects with an earlier idea proposed by Simões et al. (2013). They elaborated upon how gamification works differently from game-based learning in the classroom. Gamification utilizes the most effective components of video game elements without committing to a specific game resulting in increased levels of motivation and engagement in the learning experience. In the gamification environment created by the instructors in the three WSU courses, some of the most effective game elements were used to promote engagement and motivation supporting learning outcomes. Avatars, quests, and the elements of play were the most effective components in this environment. Other elements such as points and badges were either ineffective or had a negative effect.

Recommendations for Future Research

A productive direction for future research for the full understanding of gamification's effect on learners' motivation and engagement is to broaden the study to include more participants, to expand the implementation of different video game elements into the curriculum, and to allow for thorough planning of how to connect the use of video game elements to the learning objectives. Furthermore, a comparative study between gamified and non-gamified

classrooms in the context of college environment could contribute further to the research on gamification.

This study showed that gamification fosters competencies that traditional assessment methods fail to evaluate. Competencies that pertain to non-academic and authentic skills well-connected to real life situations such as interconnectedness and negotiation are supported in the virtual gamified environment. A comprehensive ecological assessment could give an overall understanding of the type of competencies developed in the gamified world. There is a need to develop assessment methods suitable to evaluate these competences beyond traditional exams and score reports.

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TCH LRN 518 SYLLABUS

Tri-Cities Course Syllabus
518
Spring 2017
3 credits
Course meeting times:
Lecture: W 5:45-8:30 TWST 239
Integrating technology into the Curriculum

Professor:	Dr. Jones
Office:	TWST 207C
email:	**Jones@tricity**.wsu.edu
Phone:	372-7198 office (480) 204-0029 mobile
Office Hours:	Tuesdays & Wednesdays 4:30-5:30 or by appointment
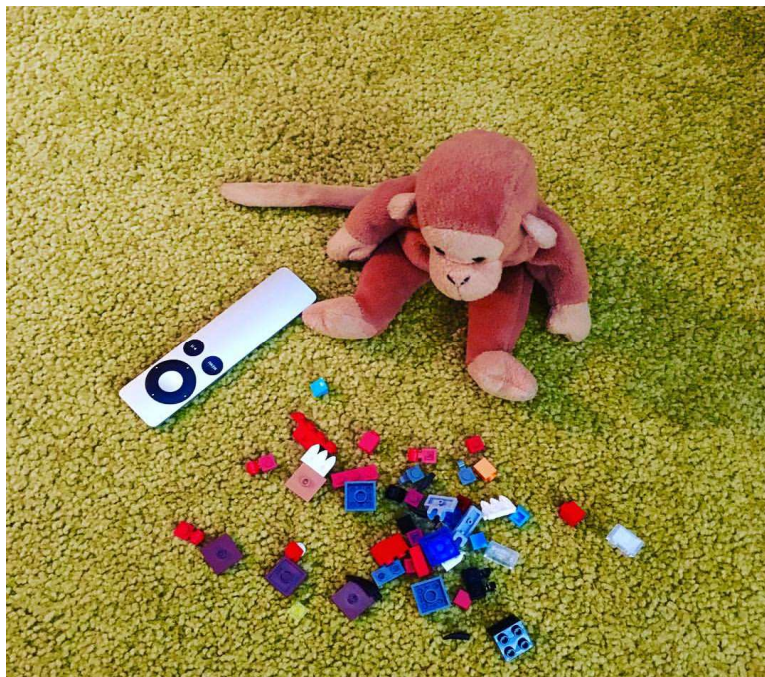
Required Textbooks

The below texts are required reading for this course. Additionally, course readings/articles are

posted in a folder in Blackboard. The readings assigned for each week are also listed in the

schedule below. The depth of our discussions is dependent upon your thoughtful and close attention to all assigned readings.

- Roblyer, M.D. (2015). Integrating Educational Technology into Teaching. (7th ed.) New York: Pearson.

- Reynolds, G. (2011). Presentation Zen Simple Ideas on Presentation Design and Delivery (2nd ed.) New York: New Riders

- Lane, F.S. (2014). Cybertraps for Educators. New York: CreateSpace Publishing

- Vinge, V. (2006) Rainbows End. New York: Tor Books OR Cline, E. (2011) Ready Player One. New York: Random House

Course Description:
This course is designed to introduce students to the educational uses of a wide range of digital technologies. The two-fold purpose is to help students develop a critical understanding of the ways in which students in K-12 settings can engage with digital technologies to enrich their learning experience, as well as support preservice teachers in developing their own fluency with digital technologies in ways that support their work as teachers. The course will focus both on theoretical understandings of digital technologies and practical uses of specific technologies within classrooms. By the end of this course students will be able to: define (educational) technology

critically evaluate popular discourses that produce constructions of children, youth and teachers in relation to technology

critically analyze a website

critically analyze the multimodal dimensions of a multimodal text

make and share a multimodal text

design a digital composition lesson

describe, evidence, and analyze their own relationships to technology, to identify areas for growth and development this semester and in the future

construct a professional, online representation of themselves and evaluate the use of gamification in a pedagogical context.

Conceptual Framework of the College of Education

The College of Education contributes to the theory and practice of the broad field of education, and dedicates itself to understanding and respecting learners in diverse cultural contexts. We facilitate engaged learning and ethical leadership in schools and clinical settings. We seek collaboration with diverse constituencies, recognizing our local and global responsibilities to communities, environments, and future generations.

The connections to the conceptual framework in this course include emphases on:

understanding and respecting learners in diverse cultural contexts as related to assessment;

engaged learning and ethical leadership as related to assessment; and collaboration with other teachers, school communities, and environments as related to assessment.

General Expectations for the Course

In this course, my primary goal is to establish a safe and inclusive environment for your learning. I invite questions and critiques, desiring dialogue to be central to our learning experience. Certainly within the field of educational psychology there are many theoretical

positions from which to work. In this course, we will work to understand a variety of positions and practices, continually pushing ourselves, and one another, to question our taken-for-granted beliefs and assumptions. During the course, there will likely be moments in which we disagree with one another regarding our positions. Yet, I believe that it is from this critically reflective place that we can more deeply reflect upon our own positions and assumptions, resulting in a more thoughtful understanding and fruitful application of theoretical principles. Indeed, constructive debate can often refine and deepen a particular argument or position, as well as open the imagination to new ideas and understandings.

In order to facilitate our learning environment, we must each work to cultivate a classroom space that generates respectful, sensitive, and empathetic understandings. What we come to learn is a shared experience; thus, we will work to cultivate a community of learners. In this community, I position myself as a co-learner, as well as a teacher. Hence, if I am teaching and you are not learning, then I am not teaching. I welcome feedback and encourage your participation.

I will facilitate this class much like a seminar, moving between whole and small group discussions. While I will occasionally provide "mini-lectures," we will rely primarily on whole and small group discussions. We will also analyze case studies drawn from a variety of educational settings (including your own) in addition to discussing applications of the theoretical principles of learning and teaching.

1. I will use the course web site (on Blackboard) and email to communicate with you during the semester. You must check your WSU email and Blackboard regularly. Make sure that

your contact information in Blackboard (and on myWSU) is correct and sign up for emergency contact through your myWSU account.

2. I assume that each student will read the texts or handouts as assigned. In general, I will not lecture over the content of the assigned reading; rather, these readings provide the foundation on which our class discussion and activities will build. It will be the student's responsibility to raise questions or to request further discussion of any issue for which more explanation or elaboration is desired.

3. Submit each assignment to the appropriate Blackboard drop box (word-processed, double spaced, 12-pt font, and in APA style, unless otherwise indicated). Make sure that you see your document loaded in your Dropbox – if you do not see it, you have not submitted it properly. Typically, your graded assignment (with feedback) will be returned to you within a week. If you do not receive it, contact the instructor.

4. *Late assignments:* This course is designed for students to develop and build an understanding through the assignments and interactions with other students and the instructor. This process requires that students submit all assignments on time (due at the start of class on posted due dates), and therefore, there is a strict policy for late work. If you are absent, due dates still apply and you are expected to submit assignments electronically or ask a classmate to deliver them. The only exception to this rule is a documented MEDICAL EMERGENCY or DEATH of you or a family member.

A 10% of the total possible grade will be deducted for everyday that it is late (including weekends):

> 10% reduction if handed in after the due date/time
>
> 20% reduction if handed in two days late

30% reduction if handed in three days late

I will not accept any work handed in more than three days late.

However, I will NOT accept ANY work after 5:45 pm on the date of the final UNDER ANY CIRCUMSTANCES including a documented MEDICAL EMERGENCY or DEATH of you or a family member.

1. You are responsible for any and all information discussed in every class. If you must miss class, notify the instructor in advance and ask a classmate for notes, additional short assignments (if given), or announcement of an upcoming quiz. If an in-class assignment was given and you were not present, you will receive a 0 for that assignment unless prior arrangements were made with the instructor.

2. Attendance: I construct this class based on a philosophy of learning that emphasizes the creation of a learning community. As a consequence, the class misses out on your contribution when you are not in class. Furthermore, as a course in a professional program, your attendance during each class period is required. Unexcused absences, excessive absences, or failure to promptly submit assigned projects will result in reduction of the final grade. See the "Participation" section of the syllabus for more information on attendance.

3. Major Required Assignments: In all of your assignments, I am looking for evidence of:

   (1) understanding and the application of the concepts and processes learned and discussed in class;

   (2) critical reflection and responses to issues and concepts;

   (3) clarity of expression;

   (4) explicit connections among ideas; and

   (5) complete work with no or few grammatical and spelling errors.

Assignments with excessive errors in spelling, grammar, or organization may not be accepted or, at the discretion of the instructor, may be returned to the student for revision and resubmission. For each assignment, I will be using a rubric to make the evaluation process transparent and grounded. All assignments are due on the date listed below (see Course Schedule). Incompletes and Withdrawals are strongly discouraged and are only given when the conditions of the university are met and after a conference with the instructor at the initiation of the student. All graded assignments must be typed for submission. All assignments are due on the due date listed in the course schedule.

Netiquette & Discussion Expectations: Etiquette for participating in conversation online ("netiquette") is important for the course community to be a safe, engaging, friendly place. Here are some guidelines that should guide your participation:

o   Avoid sarcasm. It's difficult to detect online. Remember that you are relying on your words to show the tone you intend. If in doubt, leave it out.

o   Avoid yelling. ALL CAPS LOOKS LIKE YELLING. As does a lot of punctuation!!!!!!??????? Just as you wouldn't shout during a classroom discussion, avoid shouting in an online discussion.

o   Be professional. Great discussions often include disagreements. Use positive, polite language in your comments about the text and other people's comments. For example, if you disagree: "That's a good point, but I disagree. My thinking is…." is a good way to let someone know you've read and thought about their post, but you have a different, and just as valid point of view. Avoid unprofessional language. Avoid texting shorthand (eg., UR, np). Check your spelling and grammar, and be patient with others' spelling and grammar.

o   Avoid responding immediately if you are upset. If a post or feedback upsets you, stand up and take a breath before responding. Re-read your responses carefully before finally posting them. If you aren't sure, wait a few minutes and then come back to get perspective. Once your thoughts are posted, they are there for everyone to read and even if they are removed the impact has still been made.

o   Stay on point. Avoid taking the conversation away from course content. If you want to chat with classmates about non-course related content, you can do that in the "Hallway" discussion topic.

o   Use the readings. When making a point, be sure to use the text, instructor video, or other course materials. For example, "on page 27 of the Grant book it talks about conventions, describing it as '….'. To me, this means …."

1. Be clear. Be as clear as possible in your response. Remember that you are not in the room with your classmates –all the information you want to express needs to be self-evident in the post itself. Participating in an online course often means you're learning how to express yourself online, which is an important skill.Write posts that match the question or prompt – no more, no less. As the number of posts increases as the week goes on, it's easier for everyone to participate if posts are clear and to the point, so that everyone's posts can be read in a timely manner. Read before responding. Before you respond to the instructor post, read the other comments in the discussion board first. If someone else made the point you wanted to make, you can agree with them and elaborate further, expand on the idea, take it in a different direction, or come up with a different approach altogether. Overall, be kind and be clear. The assignments for this course will undergo consistent improvement. As such assignments will be evaluated based upon the rubrics given by self, peers, and instructor. It is expected that the student will put forth their best efforts and submit solid work for review and feedback. The final course grade will reflect these efforts. Below is a list of all course assignments with a short description of each. <u>Weekly Reflections</u>: Students will be required to reflect, online, upon their own work and the processes of developing course assignments. There will be, on average, one reflection due per week. Only the highest 10 assignments will be graded. (50 points)

2. <u>Website</u>: <u>Students will create a gamified platform using Gamestar Mechanic to utilize in their own teaching practice. (20 pts.)</u>

3. <u>Description of Internship Classroom</u>: Students will write a 3-page description of their practicum classroom that highlights technology used by the teacher and students (20 pts.)

4. <u>Design of Integrated Technology Classroom</u>: Students will create an 'ideal' classroom that utilizes current (or near current) educational technology. This will include a 3 to 5-page description and diorama. (40 pts.)

5. <u>Lesson Plan I & II:</u> Students will create two lesson plans that utilize educational technology to some degree. The students will teach BOTH of these lessons in their internship classroom. Students will video tape their lessons and submit a copy of their tapes (50 pts. per lesson)

6. <u>Lesson Plan Reflection I & II</u>: Students will write reflections on their lesson plans based upon their thoughts, feedback from their mentor teachers, students, and reviewing of their video tapes. Each reflection will be 3-5 pages (20 pts. per reflection).

7. <u>Report Proposal</u>: Students will present a proposal for their Term Project. This proposal will take the form a one-page abstract plus a 4 min. description of their research agenda (30 pts.).

8. <u>Progress Report</u>: Students will present a 1-page progress report along with timeline and rough draft of their Term Project (20 pts.)

9. <u>Term Project</u>: Students will research a topic in education that concerns the integration of technology in the classroom. Individual students will develop a question, create a proposal to research, conduct research, and write a 12 to 15-page paper (APA 6th Ed. Format) (80 pts.).

10. <u>Term Project Presentation</u>: Students will present their Term Project in a 15-20 min technology assisted presentation. Students will be assessed based upon their research, ability to communicate their information, ability to engage their audience, and professionalism (50 pts.).

11. <u>Participation</u>: Students will be graded on their level of participation in the class (see rubric at the end of the syllabus) (50 pts.)

12. <u>Book Report</u>: Students will choose one of two books <u>(either Rainbows End by Vernor Vinge or Ready Player One by Earnest Cline)</u> and write a 4 to 6-page paper describing the plot, the technology used, how education is described within the novel, and how similar or different it is to current trends in educational technology (100 pts.)

<u>Grades</u> are assigned using the scale below:

Assignment		Points	
Weekly Reflections (10 @ 10 points each)		100	Points
Description of Internship Classroom	20	Points	
Website		20	Points
Design of Integrated Technology Classroom	40	Points	
Lesson Plan I	50	Points	
Lesson Plan I Reflection		20	Points
Lesson Plan II	50	Points	
Lesson Plan II Reflection		20	Points
Report Proposal	30	Points	
Progress Report	20	Points	
Term Project	80	Points	
Term Project Presentation		50	Points
Book Report	50	Points	
Participation /In class activities		50	Points
Total		600	Points

<u>Grading Rubric:</u>

The final course grade and individual course assignment scores (these descriptors apply to all assignments) will be determined using the following Dept. of Teaching & Learning guidelines:

A   93 % or above: Exceptional, <u>goes beyond requirements and expectations</u> and meets all criteria for a "B" and above.

A- 90-92%: Excellent; Well-developed ideas; Insightful; Scholarly approach.

B+ 88-89%: Very Good.

B   83-87%: Good, Fully accomplished all objectives for the course/assignment;

        demonstrates a complete understanding of the concepts, processes, theories, approaches

        of the course/assignment.

B-   80-82%: Proficient

C+   78-79%: Satisfactory

C   73-77%: Minimally satisfactory/ Partial accomplishment, minimal requirements of the

        course/assignment objectives accomplished, lack of evidence of thorough understanding

        of the concepts, processes, theories, approaches of the course/assignment.

C-   70-72%: Unsatisfactory, Little accomplishment. Course needs to be repeated for credit.

D+   68-69%

D   60-68%   F   0-60%   I   Incomplete (Must be arranged with Instructor)

Note: I expect all written work adheres to standard conventions. If written work does not

        adhere to the conventions of writing (e.g. grammatical and/or spelling errors, misused

        words or phrases, not organized or clearly presented, lack of flow of ideas), a full grade

        reduction will result.

Academic Integrity

As stated in the WSU Tri-Cities Student Handbook, "any member of the University community

who witnesses an apparent act of academic dishonesty shall report the act either to the

instructor responsible for the course or activity or to the Office of Student Affairs." The

Handbook defines academic dishonesty to include "cheating, falsification, fabrication, multiple

submission [e.g., submitting the same or slightly revised paper of oral report to different

courses as a new piece of work] plagiarism, abuse of academic material, complicity, or

misconduct in research." Infractions will be addressed according to procedures specified in the

Handbook.

Academic integrity will be strongly enforced in this course (see

http://www.conduct.wsu.edu/default.asp?PageID=343. and http://www.conduct.wsu.edu/ for

more information about Academic Integrity definitions and policies). When a student enrolls in

WSU, the student assumes an obligation to pursue academic endeavors in a manner consistent

with the standards of academic integrity adopted by the University. To maintain the academic

integrity of the community, the University cannot tolerate acts of academic dishonesty (WAC

504-26-010 specifically defines "cheating").

Violations to academic integrity include plagiarism.

Plagiarism is presenting the information, ideas, or phrasing of another person as the student's

own work without proper acknowledgement of the source. This includes submitting a

commercially prepared paper or research project for academic credit, and/or using any work

done by someone else. The term "plagiarism" includes, but is not limited to, the use, by

paraphrase or direct quotation, of the published or unpublished work of another person without

full and clear acknowledgement. It also includes the unacknowledged use of materials

prepared by another person or agency engaged in the selling of term papers or other academic

materials. If a student's work is suspected of violating the University's policies on academic

integrity (WAC 504-26-404), the instructor will assemble the evidence and, upon reasonable

notice to the student of the date, time, and nature of the allegations, meet with the student

suspected of violating academic integrity policies.

Safety

Should there be a need to evacuate (e.g., fire alarm or some other critical event), students

should meet the instructor at the blue emergency pylon in the West Building parking lot (for

classes in East, West, and BSEL) or the blue emergency pylon in the CIC parking lot (for

classes in the CIC). A more comprehensive explanation of the campus safety plan is available

at http://www.tricity.wsu.edu/safetyplan/. The University emergency management plan is

available at http://oem.wsu.edu/emergencies/. Further, an alert system is available. You can

sign up for emergency alerts (see http://alert.wsu.edu) through the zzusis site

(http://portal.wsu.edu/).

 Midterm Grades

In this course, midterm grades provide an indication of your progress and will be given using

the full range of letter grades (A-F). Students receiving a grade of D or F at midterm should

meet with the instructor. Midterm grades are advisory and will not appear on your transcript.

Midterms grades will be submitted for students enrolled in undergraduate courses by 5:00 p.m.

on the Wednesday of the eighth week of the fall and spring semesters.

Student Concerns

If you have any student concerns, you can contact Chris Meiers, the Director of Student

Affairs, in West 269, (509) 372–7139, or chris.meiers@wsuedu. If you have any concerns

about this class, you should contact your instructor first, if possible.

Disability Services Reasonable Accommodations Statement:

Reasonable accommodations are available for students who have a documented disability.

Classroom accommodation forms are available through the Disability Services Office.   If you

have a documented disability, even temporary, make an appointment as soon as possible with

the Disability Services Coordinator, Cherish Tijerina Pearson (Room 269J; 509-372-7352;

ctijerina@tricity.wsu.edu).You will need to provide your instructor with the appropriate

classroom accommodation form. The form should be completed and submitted during the first

week of class. Late notification can delay your accommodations. All accommodations for disabilities must be approved through the Disability Services Coordinator.

Contact Information

Your WSU email account will be used to communicate throughout the semester. Be sure to check your WSU email account regularly for any emails related to the course or to the University. In addition, please sign up for the emergency contact through myWSU. (Blackboard will only be used to post grades and to make required documents available.)

Professional Communication

The faculty members WSU emphasize the importance of effective written and oral communication for teachers. Students of the program are expected to demonstrate that they can meet standards of professional communication on all of their assignments. A student who fails to adhere to the conventions of writing (e.g. makes consistent grammatical and/or spelling errors, frequently misuses words or phrases, fails to organize writing in an effective manner, etc.) may be required to work with the Writing Center or complete additional coursework. Tutors in the Writing Center can help you with various writing issues you may encounter. If necessary, I urge you to meet with different tutors and find one with whom you work well. Students have found that the one-on-one attention such tutorials offer can be very helpful. The WSU Tri-Cities Writing Center is located in the Consolidated Information Center (CIC), on the second floor of the library. Walk-ins are welcome. Students will also be held accountable for demonstrating that they are capable of clear and professional verbal communication.

Learning Center

The Undergraduate Advising and Learning Center provides academic advising, free group tutoring on a drop-in basis, and learning support services for undergraduate students.

Undergraduate advising is co-located with the Career Development Center in the Consolidated Information Center (CIC) 202 Suite and provides academic advising for all undergraduate degrees offered at WSU Tri-Cities. The Learning Center is located on the second floor of the library in the CIC building adjacent to the Writing Center and houses tutoring for lower-level math, science and core courses.

The Campus Safety Plan can be found at www.tricity.wsu.edu/safetyplan and contains a comprehensive listing of University policies, procedures, statistics and information, relations to campus safety, emergency management, and the health and welfare of the campus community. Additional information is at http://oem.wsu.edu/emergencies <http://oem.wsu.edu/emergencies. The Outdoor Emergency Communication System was installed last summer. Three blue poles are located in the main parking lot near BSEL, in the CIC parking lot and along the sidewalk between the West Building and the CIC. Pushing the "help" button on a blue pole immediately calls Moon Security, our 24-hour emergency dispatch center. Moon Security stays on the line while determining the situation and forwarding the caller to the appropriate emergency responder. Each of us is responsible for ensuring the safety of our co-workers, students and guests.

Tentative Course Schedule T&L 518 (January 25, 2017–May 5, 2017)

	Readings and Activities	Assignment Due
1/ 2 5	Introduction, Syllabus, etc.	

2/1	Roblyer Ch. 1 http://tech.ed.gov http://tech.ed.gov/netp/	Barbie Bungee	Reflection 1: *Gene Glass, originator of meta-analysis techniques, said, "Experienced education leaders worry that something is lost when teachers are replaced by avatars and real life is replaced by Facebook… only a fool believes everything that can be gained from face-to-face teaching and learning also can be acquired online" (2010, p. 34). Give examples from research and practice to support or refute Glass's analysis.*
2/8	Roblyer Ch. 2 Roblyer Ch. 3	Excel	Description of Classroom Reflection 2: *The College Board has joined the American Chemical Society (ACS) and the National Science Teachers Association (NSTA) in objecting to simulated lab software (e.g., online frog dissections, mixing chemicals) when used to replace in-class, hands-on labs. Read the ACS and NSTA statements and analyze the objections they voice. What evidence can you cite to support or refute their positions?*

2/15	Robyler Ch. 4 McMahon 2015	PPT & Prezi	Tentative title and time-line Reflection 3: *In his* New York Times *blog post, "Ending the Curse of Cursive," John Tierney quoted Vanderbilt professor Steve Graham: "If every young child had a computer to write on, and the keyboards were built for young children, and we provided instruction to help them type fluently, then the need for handwriting would be questionable." Do you agree with Dr. Graham that we should eschew teaching cursive writing in favor of focusing on word processing instruction? What arguments could be made for and against this substitution?*
2/22	Robyler Ch. 5 Annetta, Shapiro, & Matthews 2015	PPT & Prezi	Lesson Plan I Reflection 4: *Some educators object to the use of tools such as test generators and worksheet generators, saying that they encourage teachers to use technology to maintain current methods, rather than using technology in more innovative ways. What case can you make for keeping software tools like these in classrooms?*

2/17	Robyler Ch. 6 Rosenblatt, Walker, & McMahon 2015	Google Sites	Proposal Due Reflection 5: *Cingel and Sundar (2012) reported results of a study that showed texting was linked with poor grammar skills in middle school students. What could teachers do to curb the possible negative consequences of texting on grammar and writing, while acknowledging students' love of this medium and their likely continued use of "techspeak" in social situations?*
3/1	Robyler Ch. 7 Lamb et al. 2015	TBA	Lesson Plan Reflection I Reflection6: *Glass and Welner (2011) are highly critical of those who equate learning online with learning face-to-face. They said it is not reasonable to believe that people can learn as much from a computer as they learn from teachers in a traditional classroom. Based on what you have read and experienced about online learning, what evidence could you cite to support or refute their position? Are there skills of knowledge that cannot be learned online? If so, what are they?*

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3/8	Robyler Ch. 8 Vallett 2015	TBA	Design of Integrated Technology Classroom Reflection 7: *Socialization is an important goal of K-12 schools, and some critics of virtual schools have argued that socialization is not possible virtual environments. Some virtual schools say they have addressed this need with online clubs and other virtual social activities. Other schools add face-to-face meetings to their virtual courses or encourage their students to join brick-and-mortar schools field trips, clubs, study groups, and extracurricular activities. Do you believe that the socialization of virtual school students will suffer du to isolation from experiences with people in the physical world? What theoretical, anecdotal, and/or research evidence can you cite to bolster your arguments?*
Mar 13-17: Spring Break			
3/22	Robyler Ch. 9 Robyler Ch. 10	TBA	Lesson Plan II Reflection 8: *Globalization and multicultural awareness are both concerns that make FL teaching and learning a critical need in 21st-*

			century classrooms. Yet K-12 language classes are in short supply due to economic constraint, such as teacher availability and too few students to justify hiring a teacher in every language that students want to take. What are some possible technological solutions to this problem? What does research show about the benefits and limitations/constraints of each proposed solution?
3/ 2 9	Robyler Ch. 11 Robyler Ch. 12	TBA	Reflection 9: *In the U.S. government's 2010 report,* Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5*, the authors make the case that the country is not making the necessary investments in science and technology to remain globally competitive. Go to the National Academies Press website and download and read a free copy of the report. What role does educational technology play in their recommendations to address this need?*
4/ 5	Robyler Ch. 13	TBA	Progress Report

	Jones 2015		Reflection 10: *Using software to manipulate images has long been possible, but it is becoming increasingly problematic in a number of settings. In his 2008 article "Journals Find Many Images in Research Are Faked," Young reported an upsurge in the number of research reports with doctored images. The 2013 World Press Photo of the Year, an image of a burial in Gaza, was denounced as being a composite of several images. However, the* Huffington Post *reported that after careful examination by a team of experts, it was concluded that the photo was "real." The photographer told the* Huffington Post *that the photo was not a composite, but that he had used software to improve its quality. What does it mean to "photoshop" an image? What guidelines should students be taught about how someone should and should not be able to use technology to alter a photograph presented to the public?*
4/ 1 2	Robyler Ch. 14	TBA	Lesson Plan Reflection II Reflection 11: *According to IDEA 2004, the federal law governing special education, school*

	Robyler Ch. 15		*districts cannot deny special education services because the solutions—many of which are assistive technologies—are expensive. But there is often a tension between what parents want and what school districts believe they can afford. What is a good protocol or manner to address such situations before you encounter them?*
4/ 1 9		TBA	
Apr 22-26: NARST			

Student Evaluation Rubric

This rubric will be used as the final evaluation of student progress in the course. This course is built upon the idea of constant improvement and growth over time. It is hoped that students will continue to make improvements to their assignments to fit new circumstances and continue to increase their own assessment literacy.

The wording under the "Exceeding" category is examples of indicators that a student exceeds expectations in that rubric element. These categories are not necessarily indicators of grades but areas where students can self evaluate and provide evidence about how they have met these categories. Both student and instructor will use this rubric to evaluate student progress over the duration of the course. If at any time a student is curious about where they are in the course

they can schedule a meeting with the instructor who will use this rubric to facilitate a

discussion of student progress and learning.

In-

Class Participation, Attendance & In-Class Work & Additional Short Homework Assignments

This course meets requirements for state legislated credentials; therefore, attendance is

mandatory. Moreover, this class is activity and discussion oriented, and your involvement in

the class is a key part of your learning. Your participation grade is based on more than attending class. At the end of the semester you may provide input regarding your participation in class. I value your input in determining your grade, and I cannot always be present to observe small group work during class activities. At end of the semester, write about one paragraph explaining what you believe your participation grade should be for the semester and why. To ensure that your grade is representative of your contributions to class, I suggest you keep a log of substantive contributions you add to each class meeting and attach this log to your participation grade statement. Below is a rubric consistent with expectations stated in the course syllabus. If you believe you should receive a certain grade, but do not meet the stated criteria, please present your case for why you might be an exception to the guidelines below.

Note: 70 points are assigned to the category of "In-Class Participation & In-Class Work & Additional Short Homework Assignments." A portion of these points (approximately 10) will be earned from written work collected from in-class activities and/or short homework assignments. The remaining points will be earned from in-class participation. I do not know the exact number of short assignments that will be collected, and so the below rubric references percentages - rather than specific point values. The percentage will be taken from the remaining participation points (approximately 40 points).

95-100%   Exceptional: Truly outstanding in all areas.

93-94%   Excellent: You have not missed class, arrived late to class, OR left class early on more than one occasion. You maintained professional behavior in your approach and attitude toward class activities and discussions and you were prepared for classes (completed readings, etc.). You were actively involved in all classes and made significant and substantive

contributions (in groups and/or class discussion). Note: I consider significant and substantive contributions to be questions or comments that reflected on readings, brought about further discussion, and/or caused the class to think deeply or in a way they had not previously thought. In addition, you actively and respectfully listened to (and perhaps responded to) others.

87-92% Good to Very Good: You have not missed class, arrived late to class, or left class early on more than one occasion. For most classes, you met criteria described above for "Excellent," but occasionally you did not actively contribute to class activities and discussions and/or your preparation for class was not evident.

83-86% Satisfactory: (1) You have not missed class, arrived late to class, or left class early on more than two occasions, and otherwise, you met the criteria described for "Excellent"; OR (2) You have not missed class, arrived late to class, or left class early on more than one occasion, but frequently did not evidence engagement in and/or preparation for class.

77-82% Minimally Satisfactory: You have not missed class, arrived late to class, or left class early on more than two occasions. For most classes, you met criteria described above for "Excellent," but occasionally you did not actively contribute to class activities and discussions and/or you preparation for class was not evident.

Note: Missing several classes has a cumulative effect great than the sum of the classes. Thus, missing 3 classes results in a maximum participation score of 50% (assuming all other expectations are fully met – which would be difficult with this number of absences) and more than 4 classes will result in a 0, and you should consider re-taking the course.

Appendix B

Student Interview Questions

1. What is your name, age, gender, and major?

2. How and in what ways do you think your participation in the gamified activities affected your learning?

3. What, if anything, promoted your motivation and engagement in the gamified activities?

4. What, if anything, about the gamified activities undermined your motivation and engagement?

5. Do you feel you were focused during the gamified tasks? If so, what helped you stay on task and avoid distractions?

6. What is the most engaging video game element you used and why?

7. Describe some of the choices you made during the gamified activities. What did you choose and did your choices motivate and engage you in learning? Were there parts of the gamified tasks you felt you had no control over? Did choice or the lack of choice affect your engagement and motivation to learn?

8. What do you think is more engaging to you: working individually or working as part of a team during the gamified activities?

9. If you had a choice, would you choose a gamified activity or a traditional assignment? Can you explain?

10. Is there anything I haven't asked that you think it might be important for me to know?

Appendix C

Instructor's Interview Questions (Dr. Edwards)

1. What is your name, your current position, your discipline, and experience?

2. You have been involved in a pilot study on employing video game elements in the Honors Writing course. Based on that, which video game element were the most engaging to your students and why? What are the early signs of engagement and motivation you can sense in the current gamified activities you are teaching?

3. Are there aspects of your course that facilitated or impeded gamification of the content? How do you think the use of video game elements helped your students learn, if any? In what ways do think gamification increased your students' motivation, if any, and where do you see the evidence for that?

4. Is there anything I haven't asked that you think it might be important for me to know?

    Instructor's Interview Questions (Dr. Edwards- End of Semester)

5. What are the effects of the gamified alternatives on your students' engagement and motivation? Which gamified alternatives were favored and by which students? Which gamified components you think were most or least effective? Why? How will you adapt the effective gamified components into your future teaching?

6. Based on your observations of the students performing different tasks, do you think their time on and task and appreciation of the task increased?

7. You chose the avatar assignment for your midterm; can you explain your choice in relationship to students' engagement and motivation?

8. Do you think your students were more engaged and motivated to see more video game elements employed in your course? Can you elaborate?

9. Is there anything I haven't asked that you think it might be important for me to know?

Instructor's Interview Questions (Dr. Jones)

1. What is your name, your current position, your discipline, and experience?

2. You are planning to integrate video game elements into your course. Which video game elements will you use in your course and why?

3. Are there aspects of your course that facilitated or impeded gamification of the content? How do you think the use of video game elements will help your in-service teachers expand their literacy skills, if any? In what ways do think gamification is expected to increase the in-service teachers' repertoire in your class?

   Is there anything I haven't asked that you think it might be important for me to know?

4. **Instructor's Interview Questions (Dr. Jones-End of the Semester)**

5. What are the effects of the gamified alternatives on your students' engagement and motivation? Which gamified alternatives were favored and by which students? Which gamified components you think were most or least effective? Why? How will you adapt the effective gamified components into your future teaching?

6. Based on your observations of the in-service teachers performing different tasks, do you think their time on and task and appreciation of the task value increased?

7. You used quests, avatars, points, and badges in your course, which one engaged the students the most from your perspective?

8. The content of your course was on incorporating technology into the curricula, how do you think that helped in adapting it to include gamification?

9. Is there anything I haven't asked that you think it might be important for me to know?

Instructor's Interview Questions: Dr. Peterson

1. What are the effects of the gamified alternatives on your students' engagement and motivation? Which gamified alternatives were favored and by which students? Which gamified components you think were most or least effective? Why? How will you adapt the effective gamified components into your future teaching?

2. Based on your observations of the students performing different tasks, do you think their time on and task and appreciation of the task increased?

3. You chose the avatar assignment for your midterm; can you explain your choice in relationship to students' engagement and motivation?

4. Do you think your students were more engaged and motivated to see more video game elements employed in your course? Can you elaborate?

5. Is there anything I haven't asked that you think it might be important for me to know?

Appendix D
Anonymous Gamification Survey
This questionnaire is intended to collect information about how gamification affected engagement and motivation in the courses you are completing. Your participation in this questionnaire is voluntary, and you may decline to answer or skip any question without penalty.

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The use of game elements increased my interest in the course work.					
I felt I had choice when I created my own avatar during the midterm exam (Dr. Edwards')					
I did not feel interested in the gamified activities.					
The game elements used were sufficient to keep me drawn to different assignments.					
I liked the fun element in the gamified activities.					
I liked working in teams more in the gamified activities.					
During the task, I was aware of distractions.					
I felt absorbed in the gamified tasks.					
The content of the gamified task addressed my interests.					
I will participate again in gamified tasks if future gamified courses are offered.					

. Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
. The gamified activities made difficult topics more interesting.					
. Overall, I am satisfied with participating in gamified activities.					
. I did not feel engaged or motivated by the gamified activity.					
. I liked the interaction with classmates.					
. Being able to impress others with my achievements during the gamified activities motivated me to do well.					
. The gamified tasks motivated / engaged me by challenging me to learn? achieve					
. I feel that more video game elements could be used in the course.					
. If I am given a choice between the gamified activity and a traditional one, I will choose the gamified activity.					
. The most engaging video game element was: A- The points.					
B- The badges.					
C- The quests.					
D- The avatars.					
E- The levels.					

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The battle against the beast.					
The choice-making.					

Appendix E
Examples of ClassCraft Analytics

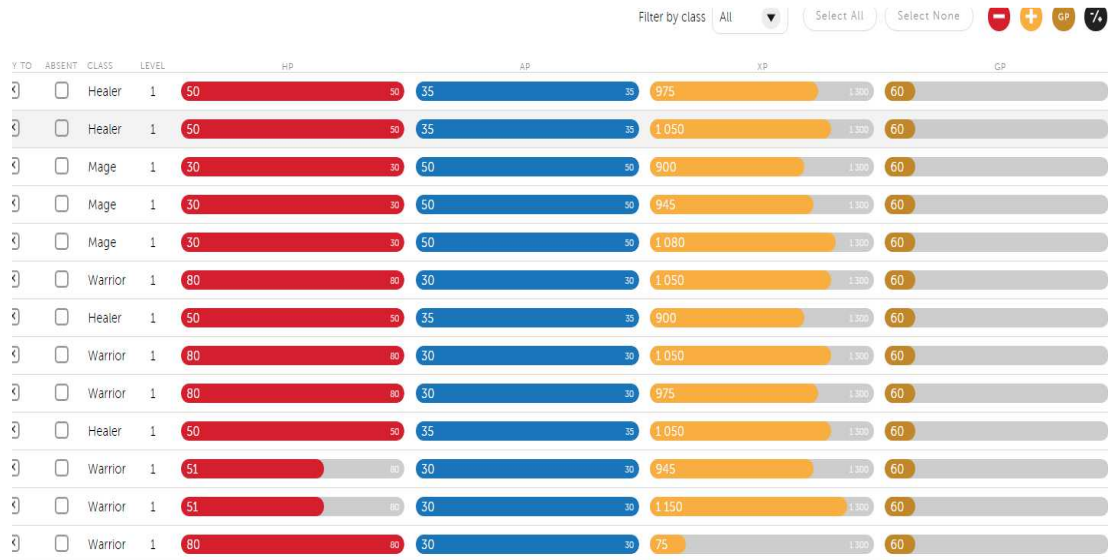Gaining Experience Points for Helping in the Class
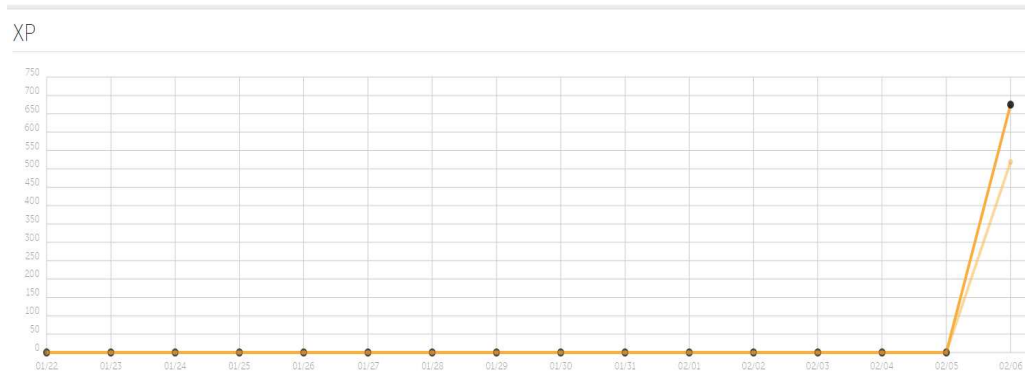
Losing Health Points by Giving Wrong Answer

Appendix F

Leaderboard Showing Students Progress (Students' Names Hidden)

Appendix G

<div align="center">

WASHINGTON STATE UNIVERSITY
College of Education

Research Study Consent Form

</div>

Study Title: Effect of gamification on the motivation and engagement of college students

<div align="center">

Researchers:

</div>

PI: Dr. Linda Mabry	PI: Dr. Deanna Day
Professor	Associate Professor
Washington State University	Washington State University
Vancouver Campus	Vancouver Campus
14204 NE Salmon Creek Ave.	14204 NE Salmon Creek Ave.
VUB 333	VUB 340
Vancouver, WA 98686	Vancouver, WA 98686
360-546-9428	360-546-9667
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<div align="center">

Co PI: Raed Alsawaier
PhD student- Department of Teaching and Learning
Department of Teaching and Learning
Pullman, WA 99163
509-330-0298
Raed.alsawaier@wsu.edu

</div>

You are being asked to take part in a research study carried out by *Dr. Linda Mabry, Dr. Deanna Day, and Raed Alsawaier*. This form explains the research study and your part in it if you decide to join the study. Please read the form carefully, taking as much time as you need. Ask **<u>Raed Alsawaier</u>** to explain anything you don't understand. You can decide not to join the study. If you join the study, you can change your mind later or quit at any time. There will be no penalty or loss of services or benefits if you decide to not take part in the study or quit later. This study has been approved for human subject participation by the Washington State University Institutional Review Board.

What is this study about?

This research study is being done to determine the effects of gamification for students in university classrooms on their motivation and engagement.
You are being asked to take part because you are in a class where gamification is a feature of the course affecting student experiences.
Taking part in the study will take about <u>45 </u>minutes for each interview and <u>15</u> minutes to

complete the survey for each student.
You cannot take part in this study if you are not enrolled in one of the courses selected for this study where gamification was offered

What will I be asked to do if I am in this study?

If you take part in the study, you will be asked to:
☐   You will be interviewed once for 45 minutes. Some follow-up questions might be added to the existing list if needed. The interviews will be recorded digitally. You may choose not to answer any interview question or to be recorded.

☐   You will be asked to complete a questionnaire one time for 15 minutes. The questionnaire will list with ten questions about your level of engagement in experiences with the gamified activities, A five-point Likert scale will be used to collect data about your perception of the gamification intervention. You may choose not to answer any survey question in the questionnaires.

☐   You will be observed during gamified class activities by the researcher during the class sessions, and the observations will be videotaped. You may choose not to be observed or videotaped.

☐   The data collected will be confidential and used for research purposes only.

Are there any benefits to me if I am in this study?

There is no direct benefit to you from being in this study.

If you take part in this study, you may help in understanding the effects of gamification in university classrooms.
Are there any risks to me if I am in this study?

The potential risks from taking part in this study are:
 You might feel nervous at first if you are interviewed. If so, the interviewer will assure that you need not answer any or all questions and that the audio-recording can be stopped, if you wish.

Will my information be kept private?

The data for this study will be kept confidential to the extent allowed by federal and state law. No published results will identify you, and your name will not be associated with the findings. Participants may be identified by fake names and no participants will be identified by real names.

The results of this study may be published or presented at professional meetings, but the identities of all research participants will remain anonymous.
The data for this study will be kept for 3 years

Are there any costs or payments for being in this study?

There will be no costs to you for taking part in this study.

You will not receive money or any other form of compensation for taking part in this study.

Who can I talk to if I have questions?

If you have questions about this study or the information in this form, please contact the researcher

Raed Alsawaier
PhD student- Department of Teaching and Learning
509-330-0298
Raed.alsawaier@wsu.edu

If you have questions about your rights as a research participant, or would like to report a concern or complaint about this study, please contact the Washington State University Institutional Review Board at (509) 335-3668, or e-mail irb@wsu.edu, or regular mail at: Albrook 205, PO Box 643005, Pullman, WA 99164-3005.

What are my rights as a research study volunteer?

Your participation in this research study is completely voluntary. You may choose not to be a part of this study. There will be no penalty to you if you choose not to take part. You may choose not to answer specific questions or to stop participating at any time.
What does my signature on this consent form mean?
Your signature on this form means that:
  You understand the information given to you in this form
  You have been able to ask the researcher questions and state any concerns
  The researcher has responded to your questions and concerns
  You believe you understand the research study and the potential benefits and risks that are involved.

Statement of Consent
I give my voluntary consent to take part in this study. I will be given a copy of this consent document for my records.

_____   _____
Signature of Participant   Date

_____
Printed Name of Participant

Statement of Person Obtaining Informed Consent

I have carefully explained to the person taking part in the study what he or she can expect.

I certify that, when this person signs this form, to the best of my knowledge, he or she understands the purpose, procedures, potential benefits, and potential risks of participation.

I also certify that he or she:
>Speaks the language used to explain this research
>Reads well enough to understand this form or, if not, this person is able to hear and understand when the form is read to him or her
>Does not have any problems that could make it hard to understand what it means to take part in this research.

_____   _____
Signature of Person Obtaining Consent   Date

_____   _____
Printed Name of Person Obtaining Consent   Role in the Research Study

Appendix H
English 298 Syllabus

Washington State University
English Department
Spring, 2017

English 298-07: Writing and Research Honors; **MWF 2:10-3:00; CUE 216. August-December.**
      Prof. Edwards -- Office Hours: MWF 12:15-1:45
                Office: Avery 491; e-mail: **;** phone 5-4828
           [**You will have much more success contacting me by email**]

Required Texts:
Eddy, Robert and Victor Villanueva. *A Language and Power Reader*. Logan, Utah: Utah State University Press, 2014.

Young, Vershawn, Rusty Barrett, Y'Shanda Young-Rivera and Kim Brian Lovejoy. *Other People's English*. New York: Teachers College Press, 2014.

Optional Texts: (If you read either book and write a detailed two-page single spaced font 10 cultural analysis, I will give you extra credit & will mention your extra work in a reference letter that you will likely ask me to write).
      Molinsky, Andy. *Global Dexterity: How to Adapt Your Behavior Across Cultures Without*   *Losing Yourself in the Process.* Harvard Business Review Press, 2013. 240 pages.

Zhang, An Lan. *Flowers in Chinese Culture*: *Folklore, Poetry, Religion.* St. Petersburg, FL: Three Pines Press, 2015. 145 pages.
Supplemental Readings. (I will provide these as handouts.)
Links

Silva Rhetoricae http://rhetoric.byu.edu/

Perseus Digital Library http://www.perseus.tufts.edu/hopper/

The Purdue Online Writing Lab (OWL) http://owl.english.purdue.edu/

Research and Documentation Online, 5th ed. http://bcs.bedfordstmartins.com/resdoc5e/

Stanford Encyclopedia of Philosophy http://plato.stanford.edu/

Course Description:

... the concept of the contact zone teaches us to perceive one's self as continually being formed and reformed. Furthermore, this self is seen as made and changed through interaction with others in the process of negotiating with those with less -- as well as more -- privilege than oneself. This image of a self in the making challenges our faith in freedom of self-expression. It asks us to assume accountability for the operation of power in any expression of the self. For the freedom of the privileged is oftentimes grounded in the oppression of an "other."   Min-Zhan Lu

It is not enough for teachers of writing to invite others to join the conversation of academia that is itself predicated on Western premises and Western privileging systems; the teachers themselves must enter the larger conversation of a literate and textual Amerindia and Latin America. The field of Composition Studies cannot presume, with its critical democratic ideals, to invite the participation of others while maintaining a colonial unconscious which repeatedly shuts down the possibilities for the content and terms of debate. Damian Baca

Welcome to our course. English 298 focuses on the writing of academic research, and the rhetoric of academic discourse. A "discourse" is the formal or official conversation of a group. Academic writing is "rhetorical" in that it cannot be objective or unbiased because writers are not machines. Writers have points of view; we have world views that influence our perceptions and judgments. We should certainly try to be fair, and remember that academic discourse is collaborative: a team sport. The more voices the better. William Coles Jr. says that learning academic discourse – college writing – involves acts of learning that include a "change in language, a shift in terminology or definition, the replacement of one vocabulary (or syntax) with another." Kenneth Burke insists that to construct a self in a given rhetorical situation, "only those voices from without are effective which can speak in the language of a voice from within." We will decide together what Coles and what Burke mean. To be successful college writers and

researchers, students need to be able to identify rhetorics, to move within them and across them. As Min-Zhan Lu indicates in the head note, college writing is a contact zone where students have to deal with changing selves "being formed and reformed" in response to changes in language and definitions, but also in response to "the operation of power," "the freedom of the privileged," and "the oppression of an other." Doing research is entering a new culture by carefully considering a different argument. Damian Baca indicates in the headnote above that being a fair reader of a different argument involves overcoming "a colonial unconscious which repeatedly shuts down the possibilities for the content and terms of debate." If we finish the research project – finish our time in the new community, or in the new discourse – we will have been changed by the experience, however subtly or substantially. If we listen to "others" with engagement, if we engage researchers with points of view different from ours as equals in a contact zone, exciting possibilities for change and growth are opened.

Student Learning Outcomes:

+ Reading rhetorical and cultural texts carefully and critically.

+ Learning the rhetorical conventions of academic research and writing, and the pleasures of acknowledging indebtedness, which demonstrates how much you have read, and enables you to avoid plagiarism.

+ Constructing research-based writing with a rhetorical sense of purpose and a sophisticated use of evidence.

+ Analyzing your own and your peer's writing by providing functional commentary.

+ Producing a variety of critical texts using appropriate technologies that contribute to rhetorical and cultural discourses.

+ Extending your understanding of the professional and civic functions of writing.

+ Comprehending the connections between writing and the privileges that people hold or seek.

+ Answering the question in "Teacher Focus" in productive and dynamic ways, so that you see how engaging cross-cultural rhetorics and understanding language diversity are crucial to our work as professionals and informed citizens in twenty-first century multi-cultural democracies.

Attendance: The success of our class requires involved student-researchers. Attendance and arrival on time are crucial. Attendance means being fully prepared for every class, participating actively, and turning in all assignments on time. Please arrange with me *in advance* when you must miss a class. If you miss more than four class meetings [two weeks of class] you cannot pass this course.

Time Management: Spend at least two hours on writing, reading, and research outside of class for each hour of class time per week. Six hours per week of homework for our class is the minimum if you want to move toward your best work.

Teacher Focus: This course will help you in this most crucial way of all:

imagine that just before or after your college graduation, you are in an interview for your dream job. The hiring committee is multi-cultural, the interview is going well, and the committee asks you a final question:

"How do your cultural identity and comfort level influence the people you work with, especially the people of cultures other than your own whom you might supervise?"

This course will help you answer that question in dynamic and exciting ways.

Audience Assumption: After years of college teaching in North America, Europe, Asia, Africa, and the North America again (in that order) and after more than a dozen years at WSU, I know from experience that every member of this course is an experienced reader and potentially a

better writer than she or he thinks is possible. I know you can get much stronger as a researcher-writer. I also assume that your sociological imagination must become considerably fuller for your optimum success as a member of the profession and/or activism you are aiming at as a soon-to-be college graduate. I will focus on how cross-cultural communication and competing rhetorics influence the life chances of groups and individuals.

Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. For more information contact a Disability Specialist. Pullman or WSU Online: 509-335-3417, Washington Building 217; http://accesscenter.wsu.edu, Access.Center@wsu.edu

Academic Integrity Statement (Updated August, 2016)

Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) will fail the assignment, will not have the option to withdraw from the course pending an appeal, and will be reported to the Office of Student Conduct. Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of the definitions of cheating: http://app.leg.wa.gov/WAC/default.aspx?cite=504-26-010. If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding. If you

wish to appeal a faculty member's decision relating to academic integrity, please use the form available at conduct.wsu.edu. **Plagiarism**: Professor Eddy's responsibility is to help you understand and correctly practice the academic conventions of quotation, paraphrase, summary, citation and documentation. Your responsibility is to ask any questions, raise any concerns, or voice any confusions that you have. Communicate such issues in class, if possible, so that other students can benefit from the increased clarity. In addition, feel free to talk with me in my office. My assumption about you is that you are honest but surrounded by a culture of theft, and that we both have to work hard to help you avoid unintentional plagiarism.

The Campus Safety Plan: Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the "Alert, Assess, Act," protocol for all types of emergencies and the "Run, Hide, Fight" response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able). Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI's Run, Hide, Fight video and visit the WSU safety portal.

OEO Syllabus Statement

Discrimination, including discriminatory harassment, sexual harassment, and sexual misconduct (including stalking, intimate partner violence, and sexual violence) is prohibited at WSU (See WSU Policy Prohibiting Discrimination, Sexual Harassment, and Sexual Misconduct (Executive Policy 15) and WSU Standards of Conduct for Students). If you feel you have experienced or have witnessed discriminatory conduct, you can contact the WSU Office for Equal Opportunity

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(OEO) and/or the <u>WSU Title IX Coordinator</u> to discuss resources and reporting options. (Visit <u>oeo.wsu.edu</u> for more information, including a list of confidential and other resources). WSU employees, with limited exceptions (e.g. confidential resources such as health care providers and mental health care providers – see <u>oeo.wsu.edu/reporting-requirements</u> for more info), who have information regarding sexual harassment or sexual misconduct are required to report the information to OEO or a designated Title IX Coordinator or Liaison.

Resources: Avery Microcomputer Lab (AML): All students in English courses have access to the AML lab, which is located on the first floor of Avery. The hours are posted on the bulletin board outside the AML. Find out more about the variety of programs and equipment available.

The Writing Lab is free to WSU students, and provides assistance with all types of writing at Any stage of the process. You are encouraged to visit the Writing Lab as you work on writing assignments. However, they aren't a copy editing service, so don't even try dropping off your work expecting someone to proofread it for you. They will work with you to improve your writing. The Writing Lab is located on the main floor of the CUE building (across from the CUB),

and has open hours throughout the week.

Course Grade: This course will be graded by portfolio. This structure will be explained in class. Evaluation will be by me and by you using the Portfolio Rubric, below, and the Student learning Outcomes, above. I want students to consider that an optional but crucial part of the work of the course could be course documentaries, perhaps done by students in groups of three. We will decide together.

Portfolio Rubric: This course will be graded by portfolio at the end of the semester. The course

rubric looks toward the multi-cultural present and increasingly multi-cultural future. <u>Remember that these rubric items are looking at the portfolio as a whole, not at separate items within the portfolio.</u>

I. Purpose
1. Clearly state your position or focus explicitly, or fashion an implicit focus.
2. Provide ways for the class audience to be interested in your position.

3. Imagine a multi-cultural audience of people, some or many of whom do not uphold only the cultural perspectives and values of you as the writer of the portfolio.

II. Content

1. Support your claims with sufficient academic evidence and a convincing argument.

2. Show knowledge of key ideas from textbooks, other course materials, classroom and digital discussions, and use all of these resources to analyze language and rhetoric in significant ways.

3. Demonstrate a strong effort toward answering the main question of the course: "How do your cultural identity and comfort level influence the people you work with, especially the people of cultures other than your own?"

4. Is a significant percentage of the portfolio academically critical and creative, and does it take risks in moving from mono-cultural or mono-perspective oversimplifications to multi-cultural complexities and perspectives?

5. Correct and convincing use of quotations, paraphrases, and summaries of source writers are crucial to academic writing, but the student's voice is the main and most persuasive voice in most papers in the portfolio.

III. Organization

1. Design each item in the portfolio in such a way that it keeps its focus, directly or indirectly.

2. Be aware of rebuttals to your argument and address them explicitly and with respect.

3. Make sure your closing discussion offers a clear sense of the implications to your argument.

IV. Conventions

1. Use MLA or a different citation system including quotation mechanics appropriately.

2. Present prose mostly free of grammatical and punctuation errors and typos.

3. Provide prose that is fluent and clear, but that also has some style.

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Course Calendar

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Bring the textbook and/or the handout to class on assigned reading days. Try to re-read

assignments a second time ***before*** due date.

Week 1 January 9, 11, 13

Mon.   Course Expectations: rhetoric, research, you, me, us.

Weds. Where you are as a rhetorician-writer-researcher and where do you need and want to go?

Fri.   Check your knowledge game (ClassCraft)

              "What Is Rhetoric?"

Week 2 January 16, 18, 20

Mon.   Holiday; no class

Weds. Student introductions

Fri.   Eddy Textbook 143-149; 165-172

Week 3 January 23, 25, 27

Mon.   Quest: Read the article "Is Your Baby Racist?", mark the main ideas, share with class.

Handout:

Weds. Handout: Paper 1 Assignment

Fri.   Eddy Chart

Week 4   Jan 30, February 1, 3

Mon.   Open

Weds. **Writing task due:** first draft of Paper 1 due.

Peer review on Edmodo: Earn badges as you exchange peer review on Edmodo.

Fri.   Textbook: 231-260

Week 5 February 6, 8, 10

Mon.   Handout: Metaphors We Live By: Gamified Cultural simulation 1.

Weds. **Writing task due:** "final" draft of Paper 1 due..

Fri.   Gamified Cultural simulations. Optional (Evening) Writing Marathon #1

Week 6 February 13, 15, 17

Mon.   Textbook: 295-302; 315-330.

Weds. Open. Paper 2 assignment- Gamified Cultural Simulation 2.

Fri.   <u>Mid-Term Examination</u>: timed in-class writing

Quest: Create your own life-like avatar at home. Write about the politics of power and beauty in

the Western culture, Use two references.

Week 7 February 20, 22, 24

Mon.   Holiday; no class

Tues.   **Writing task due:** first draft of Paper 2 due: Peer review of draft. Fri.

Game Quiz on Textbook: 221-230 using ClassCraft.

Week 8 Feb 27, March 1, 3

Mon.   Open

Weds. **Gamified Game Quiz** Mid-semester grades sent by 5:00

Fri.   Library research session in Terrell library

Week 9 March 6, 8, 10

Mon.   Lecture: "Three Forms of the Research Paper."

Weds. **Gamified Game Quiz-Writing task due:** "final" draft of Paper 2 due.

Fri.   Library research session in Terrell library

Week 10 Spring Vacation: March 13-17

Week 11 March 20, 22, 24

Mon.   Workshop on paraphrase & summary.

Weds. **Gamified Game Quiz** Open. Optional (Evening) Writing Marathon #2

Fri.   Textbook: 335-357.

Week 12 March 27, 29, 31

Mon.   Course rhythm adjustment: fast, slow, focus

Weds. Handout: "Writing: the Interpreter of Desires."

Fri.   Open

Week 13 April 3, 5, 7

Mon.   **Gamified Game Quiz Writing Task Due**: Culture Paper Draft #1.

Weds. Lecture & discussion: "Burke's pentad."

Fri.   Summary workshop: textbook: 206-220

Week 14 April 10, 12, 14

Mon.   Summary and paraphrase workshop

Weds. **Writing task due:** research status report & working <u>annotated</u> bib of at least 25 items.

Fri.   **Gamified Game Quiz** -Open

Week 15 April 17, 19, 21

Mon.   Preparation for first draft of research paper

Weds. **Writing task due:** first draft of your research paper due: Peer review of draft.

Fri.   Open

Week 16 April 24, 26, 28

Mon.   Preparation for "Special Activity" for next class.

Weds. **Gamified Game Quiz** Special Activity for next-to-last class session.

Fri.   Last Day of Class. Ritual parting: "Where have we been? Where are we going?"

Final Examination Week: May 1-5

Writing task due: final & graded draft of your research paper

> <u>Final Examination</u>: timed in-class writing.

Final semester grades due Tuesday 9ᵗʰ May at 5:00pm

Appendix I ENG 402 SYLLABUS

Pullman Summer 2017 Course Syllabus
ENG 402: Technical and Professional Writing
INSTRUCTOR: Dr. Peterson
Office: 367 Avery Hall. Office Hours: By appointment.
Email: Tel:

REQUIRED TEXTS:

TECHNICAL COMMUNICATION, by Mike Markel

*A good grammar reference. You can pick good grammar references up cheaply at used

bookstores or on Amazon.com

Longitude by Dava Sobel (Walker and Company)

**Note on the Reading: Students who do not have the assigned reading in front of them for
the day will be asked to leave class. This will be counted as an absence. This policy does
not apply on the first day of class. But do understand that you must do the reading. Come
to class prepared.**

COURSE OBJECTIVES: This course is designed to strengthen your understanding and

mastery of language in the context of technical and professional communication. This involves

exploring the concept of rhetoric and the various rhetorical options available for a given

professional writing task. The truth is, you already know what rhetoric is in an instinctive way.

Without knowing it, you use rhetoric in conversation and personal letters. The aim of the

course, however, is to raise your rhetorical awareness to a more conscious and effective level

when you sit down to write in the workplace.

    This means learning to write with a clearer sense of audience and purpose in professional

communication, and with a critical and open-minded awareness of the techniques and strategies

useful for different writing tasks. This also means learning to read more critically, and with rhetorical awareness for good writing and bad. How can we master writing techniques if we haven't learned to see those techniques when they are used for better or worse?

Therefore, we will focus attention on parts of the writing process: arrangement, drafting, revising, and editing. We will look at what makes professional communication effective and credible through structure, use of logic, voice, style, and tone. We will also review the formal requirements of report writing, such as use of bibliographies, abstracts, graphs and so on.

ROUGH DRAFTS: Finally, revision is a critical component of the writing process. You must turn in a rough draft for each of the major papers you will write. There should be a significant difference between the rough and final drafts. This tells me you have gone through the intellectual process of developing your argument, considering its strengths and weaknesses, and making the necessary changes using the rhetorical strategies available to you.

Moreover, you will critically examine each other's work in peer review groups. The ability to engage in honest, forthright, constructive discussion is a must for group work. Being able to work as part of a team, by the way, is a workplace necessity.

Remember that writing can be tough and frustrating, but ultimately rewarding.

One more thing! The success of this course depends on you. Active, spirited participation is critical. Feel free to express your opinion, and to disagree with other students, and with me. But remember to conduct yourselves with respect and consideration.

ATTENDANCE: **You have one free absence. After that, you lose a full letter grade for every unexcused absence. After the third absence—you'll receive a written warning and a request for a meeting to reconsider whether or not you should remain in the class.**

Remember, chronic absenteeism proves the student's lack of commitment. Students more than ten minutes late to class will be counted absent.

REQUIREMENTS: I don't accept late work. Also, PARTICIPATION—which covers your class involvement, including exercise assignments—is 25 percent of your grade. Yes, 25 percent. I expect you to be in class every meeting fully prepared and ready to participate, to voice your opinion and defend it. Also, all work must be typewritten, double-spaced, unless otherwise indicated by the instructor. Font size and margin should be identical to what you see on this page.

EXERCISES: You must complete a number of exercises covering the mechanics of writing. These include short papers, technical and group exercises, and brief oral reports. These assignments are 15 percent of your grade.

COVER LETTERS: Three major papers compose the bulk of the course work. Every paper must be accompanied by a half-page cover letter to me. The letter is an assignment progress report. Tell me what your goal is, who you think your audience is, how you did your research for the assignment, and what happened during the course of writing it. Consider this like a personal journal entry (though I will read it) in which I am trying to get you to think about your own writing process.

MAJOR ASSIGNMENTS:

1) **Problem Memo:** The task here is to define a problem that has become an issue in your workplace. This may involve something or someone within your work unit or another division of the company. In the memo (three double-spaced pages in memo format, which I will give you) explain and define your problem for your audience (3-4 pages, 25 percent).

2) **Defining and Explaining a Process.** This, also, should take memo form. This might involve how a piece of machinery or software works. Or it might involve defining how your team will approach a specific task. There are many different types of processes (3-4 pages, 25 percent).

3) **Final Project: Defining a Problem and Proposing a Solution.** This takes the form of a proposal and an argument, and the assignment has two parts--written and oral. For this you might propose a new program, or perhaps a change in strategy involving some aspect of your company division. You must explain your idea, support it, and defend it. The challenge is to convince an audience that your idea is realistic and doable.

I will ask you to hand in an annotated bibliography with this assignment and make a five-minute oral presentation. Your written report will complement the presentation and must be turned in. More on this assignment when the time comes. Begin thinking of a topic NOW!!. I will ask you to hand in preliminary proposals for this assignment at the beginning of the third week of class. (10-12 pages, 25 percent).

Class Schedule

Week One: Assign and discuss **Paper One**. This is a workplace memo in which students will define and prove the existence of a problem. Read assigned chapters in text and in the book, *Longitude*. We will discuss research methods. Students will begin working on research log for **Final Project**—-the Project Proposal. Discussion and exercises in issues of writing style: sentences and sentence structure. We will also work on understanding audience and how to meet the needs of the professional workplace reading audience.

READING: TECHNICAL COMMUNICATION, Chpts 1-3, and Chpt. 8

I will assign reading from **LONGITUDE** as we go.

* I will refer to the *Handbook of Technical Writing* week by week as we go along. Use it has a helpful guide to assignments. I will also make reading assignments in the Handbook as we go.

Week Two: Paper One Due Tuesday. **Assignment of Paper Two.** On Monday, we will do in-class workshop connected to Paper Two with exercises using ClassCraft gamified platform. Paper Two: Create an avatar using Voki.com (recommended) and use technical English to discuss the steps you have taken to perform this task and the logic behind your choices.

Grammar and Style Unit:

Discussion and exercises in issues of writing style, understanding paragraphing and structure, as well as sentence style and structure, and understanding active voice and passive voice. Read Chapters in Text and *Longitude*. We will be discussing *Longitude* in class in context of also understanding the Final Project.

READ: PART TWO of TECHNICAL COMMUNICATION: Chptrs 1-2, and Chpts 14, 16, and 17.

Week Three: We will be discussing *Longitude* in class and assigned readings. **Paper Two due** on Tuesday. Discussion of Final Project and issues in research skills. Introduction of the research log with research exercises. Continued discussion and exercises in grammar and style.

READ: Chpts 5 and 6 in TECHNICAL COMMUNCATION- Game quizzes will be used to review your knowledge.

Week Four: We will concentrate on research and writing problems and possibilities connected to the Final Project. Discussion and exercises with keeping a research log. Discussion of assigned readings. In-class writing exercises.

READ: TECHNICAL COMMUNCIATION: Chapters 18 and 21.

Week Five: Lectures and exercises in public speaking. Lecture and exercises on the process of Peer Review. One or two days of Peer Review Workshop.

Week: Workshop on Monday. Final Project presentations Tuesday, Wednesday, Thursday.

FINAL PROJECT DUE BY FRIDAY last week of class.