

*ENROLLED*: CREATING A BOARD GAME TO INFLUENCE STUDENT RETENTION  
AND SUCCESS

by

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## ABSTRACT

This dissertation documents the justification, creation, and refinement of a traditional board game to be used in first-year experience (freshman seminar) courses. The board game *enRolled* allows students to play college in a guided classroom environment. The game creates a low-stakes environment for students to be able to fail at college without risking time and money. Further, it is designed to give students a relatable topic to debate. By having a common experience, students can distance themselves from what their expectations of college are and deliberate on the tangible game they have played. The discussions that stem from this play and the modification of the game elements are designed to help the students take ownership over the experience. Having a game experience to discuss allows a student to objectively analyze their player's path through the academic setting and debate realistic and perceived unrealistic challenges. Through these discussions, it is possible for students to engage with content while having little to no firsthand knowledge. It is the hope of this author that the creation of *enRolled* leads to a more engaging curriculum in first-year experience courses.

Keywords: Game-Based Learning, First-Year Seminar, Freshman Seminar, *enRolled*

## **ACKNOWLEDGMENTS**

I began my doctorate in Community College Leadership in May 2014. As I write the last section of my dissertation on September 1, 2018, I have a hard time reflecting on all the details. Over four years of effort, travel, friendships, hardships, and struggles, late-night assignment submissions and endless revision-filled weekends became the norm. Through it all I have a smiling and supportive family, a cohort that makes the arduous more interesting, and academic guides to show the way. At no point in the history of my academic life did I envision myself as Andrew H. Peterson, EdD. It is with a mix of personal pride and recognition of my personal and professional network and their support that I could accomplish this endeavor.

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## PREFACE

I have always played games. It was part of the family culture growing up. I am not sure if this was influenced by growing up in northern Michigan, leaving me with a lot of idle time, or if my parents just enjoyed the hobby. Games were the universal experience across my early social interactions. Peer interactions were usually game-based, a freeform expression of play that would make anyone long for the past. My parents had unique family circles. On the blue-collar side, we would end up playing penny poker with a mix of relatives who ranged from the youngest to the oldest. If someone was old enough to hold the cards, that person could sit at the table. On the other side, we played formal games like Bridge or Cribbage. The number of people who wanted to play usually determined the game selection.

When electronic games were introduced to the household in the mid-80s, the connections to games and social interaction only strengthened. I recall one of my dad's friends coming over to show casing his vast library of Commodore 64 games. Having multiple kids and a couple of adults sit around a small computer screen to play *Summer Games* (a game that featured various Olympic events) influenced not only my desire to learn more about computers, but also included games as part of my perception on healthy social interactions.

I recall learning early on about the ability to hack games by reading the code that made them. One of the earliest specific examples I remember is *Jumpman*. If you waited about 45 seconds into the load process, you could press Run, Stop, and enter a new line of code that would give your character 100 lives. The idea of modifying and controlling the game environment was enough to inspire me to enter the technology field. I remember watching the credits scroll after

beating TSRs Gold Box edition of *Pool of Radiance* and thinking that it was someone's job to make that game.

While I visited China, I was able to interact with random strangers in a public park because I was familiar with *Jianzi*, informally called *Chinese Hacky Sack*. With no ability to speak each other's language, I was still able to approach the social circle, introduce myself to their game, and play for 30 minutes. It was as unique and positive of an experience for the others playing as it was for me.

I have run game sessions at Gen Con for groups of Girl Scouts, earning an honorary gamer badge from them in the process.

While serving as the faculty advisor to the League of Legends club at Ferris State University, events were hosted where students and faculty would mingle. This almost forced peer-level interaction as everyone was all on the same playing field. Students often defeated me in games, but I like to try and recall at least a couple times where I have also won. The environments were not competitive enough to really emphasize a win/lose outcome. The real win, in my opinion, was in the camaraderie and relationships this medium established.

Games let me have a reason to be social with anyone; they are universal. I could talk to peers about the latest and greatest fad. I could talk with individuals two generations older while we played something mutually familiar. Children always have a game they play or has captured their interest. If I knew a game that someone liked to play, I would almost always be rewarded with a positive social interaction.

When I started teaching at the college level, I felt a disconnect between students and myself. I wanted to make it safe for students to communicate with me, so it was natural to turn to games. Games have always established unique opportunities for unusual interaction. It has been

my experience that student interaction with faculty is one of the key components to creating a successful learning environment. While teaching game design, it was easy to build the social aspect into the curriculum. The first iteration of *enRolled* was created through necessity when I experienced a disconnect with students returning to the classroom after failing out of college. These students had limited positive experiences in college to draw from and the prescribed curriculum felt more punitive than anything else. After the first couple of iterations of the formal lectures, I was just as bored as the students were. There was no discussion or engagement; the class was a 50-minute requirement that involved sitting in a classroom and occasionally doling out an assignment.

With this timely reflection, it was easy to deviate to more of a game design-centered curriculum. I challenged the students to help me build a board game based on college. This shifted the entire classroom experience. Each week we discussed different variables in college life and considered how those variables might influence student success. As soon as we shifted those variables from personal experience to those of board game mechanics, everyone could discuss every variable because it was now just a game. What surprised me during the discussions was that students brought up personal experiences to support their points. This was the same class that sat absolutely silent at the beginning of the semester now freely discussed their successes, failures, and random events that tanked their college experience. It inspired me to capture that essence and reproduce it for others.

This was the informal start of the project that eventually found its way into my dissertation. During early discussions, I was forced to accept that not every faculty member could lead students through the game design process. That is why the first recommended assignments is to modify the game. There is a simple mechanic in the game where students draw

from the Event deck. This represents the random occurrences that can help or hinder your progression in college. If you are familiar with *Monopoly*, these are similar to the Chance cards. My disclaimer with students is that the Event deck is what a 42-year-old white male considers to be issues that influence college life. This usually gets a laugh and motivates the students to update the Event deck with their experiences or perceptions. Once that is complete, we debate the modifications, make any agreed changes, and play the game again.

At this point, the students own the game; it is *their* experience. The classes, degrees, and studying mechanics serve to anchor the experience in the college environment (which perhaps could be something that can be modified by further iterations). Within the context of the game, these are small discussion points that add flavor and meaning.

If I can help faculty make one learning objective a little more engaging, I view it as a success. I regularly hear about freshman seminar courses and how students are disengaged because the content is delivered by traditional methods of lecture without much interaction. One of my fears in the onset of the dissertation process was that I would write content and it would sit in a three-ring binder on my desk, unread and unused by anyone. By creating a game specifically designed for an audience with a clear need, I feel like I have succeeded in making the post-secondary educational landscape more engaging.

## CHAPTER ONE: INTRODUCTION

### Introduction

Student success and retention is a critical conversation across college campuses. When a student fails out of college, he or she is burdened with debt and the lack of means to obtain more gainful employment. In the design field, John C. Maxwell coined the mantra “fail early and fail often” (Maxwell, 2007, p. 79). It communicates that the faster a problem is identified, the less costly it is to fix. This creates a demand for rapid and affordable prototyping of any given product. However, college lacks that prototyping phase for students. The first time a student attempts anything college-related, it counts for grades, costs money, and the time spent pursuing the endeavor can never be regained. It is the hope of this educator to give students the opportunity to “fail early and fail often” (Maxwell, 2007, p. 79), and become more likely to succeed in college when it counts.

This conversation will be saturated with the topic of game-based learning and gamification. Karl Kapp gives us a modern and succinct definition of gamification: “Gamification is using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems” (Kapp, 2012, p. 10). Alternatively, game-based learning is generally defined as a game designed with a specific desired learning outcome (Prensky, M., 2006). The Institute of Play merged these two concepts and has established “Game-Like Learning Principles.” This collaborative defines the qualities of game-like learning as found in Figure 1.



(Source: Institute of Play, n.d.)

*Figure 1. 7 Principles of Game-Like Learning*

This idea of game-based learning, gamification, or game-like learning looks much different than a traditional classroom environment. Yam San Chee acknowledges these differences: “Teachers were challenged in trying to overcome old teaching habits. A teacher spoke of the difficulty of really being a facilitator rather than the traditional ‘imparting-of-knowledge’ kind of teacher she was accustomed to being” (Chee, 2016, p. 149). The shift from being the person with all the content that the students needed to become the person to inspire them has sparked many conversations. The shift from the *sage on the stage* to the *guide on the side* has filled conference keynotes and peer-reviewed journals in the educational discipline for the recent past. Content is no longer king; engagement has replaced it as the dominant necessity in the classroom. Content supports engagement, while engagement provides the demand for meaningful content. As content is embraced as meaningful, learning becomes more natural.

Games can be viewed as time fillers or distractions from the delivery of traditional classroom content. Some teachers do not see games as an alternative tool for content delivery but as a distraction from the content. Games might even be the reward for completing a menial task.

Teachers who view games in this framework might use games, but only those that relate directly to content. Games in their classrooms will usually take the form of *Jeopardy*, *Trivial Pursuit*, or flashcards. As Chee states, “Educators and researchers who view games primarily as vehicles for content learn to adhere to the layperson’s view that the purpose of schooling is to acquire knowledge” (Chee, 2016, p. 3).

### **Statement of Purpose**

The purpose of this project is to provide educators with a board game that creates an engaging, low-risk environment for students to experiment and question possible academic situations. This game will focus on students who are about to start or have begun a traditional college path. The ideal player is either a senior in a United States high school or a college freshman *enRolled* in a freshman seminar course. This narrow focus allows the development of the game to target a specific audience. Customization of the core game could allow for broader audiences.

Games are designed to engage the player. However, as Chee stated, “Games are not created equal” (Chee, 2016, p. 3). The goal of this game is to provide educators with a tool that engages students in the content before personally experience it for themselves. Without engagement, voluntary play will not continue, and the player will not progress. Similarly, curriculum must be designed to interest the student; without designing for engagement, a student is less likely to own the content. Passive reception and echoing of content can only be defined as success as it relates to a grade, not from actual learning. Engagement must exist for deep learning to take place. Mihaly Csikszentmihalyi stated that, “Aleatory games are enjoyable because they give the illusion of controlling the inscrutable future” (Csikszentmihalyi, 2009, p. 73). Likewise,

a primary purpose in the creation of this project was to create an enjoyable game that allows prospective students of higher education to partake in the illusion of completing that challenge.

As a standalone task, this board game is unlikely to cause any deep reflection. It will be the role of the instructor to introduce the conversation after play to try and engage the student in the academic conversation about why this could be meaningful. The game is designed to create meaningful discussion, not present a replacement for content delivery. The game itself offers no purpose other than to enhance the conversation that follows. In this aspect, the game is designed to bring about a play state like the one defined by Huizinga: “Like all other forms of play, the contest is largely devoid of purpose. That is to say, the action begins and ends itself, and the outcome does not contribute to the necessary life-processes of the group” (Huizinga, 2014, p. 49). It is accepted that this game is unlikely to be casually played purely for the entertainment outside of a classroom environment.

Students traditionally find engagement in games. Gaming is a cultural norm that transcends most cultural and socioeconomic barriers. Where it might be hard to find a common trait between a senior high school student in Iowa and one in New York, gaming gives us that bridge. According to the Entertainment Software Association 2016 Annual Report, “65% of U.S. households own a device used to play video games” (Entertainment Software Association, 2016, p. 13). Add to this, the fact that sales of hobby games in the US and Canada reached \$1.4 Billion in 2016 (Griepp, 2017), thereby confirming that games are a dominant part of the modern American culture.

It is one of the primary purposes of creating this play experience to enhance traditional instruction. Huizinga (2014) states, “According to one theory play constitutes a training of the young creature for the serious work that life will demand later on” (p. 2). As a standalone event,

this game will give students a relatable experience. Every player will experience challenges and small victories during the game. The play makes the conversations about academia that follow more realistic. It will not be knowledge in isolation, but a conversation that can reference back to the play experience. This will allow the students to take ownership over the dialogue and engage in discussions of the content.

The traditional method of instruction for the target student is lecturing about what to expect in college. In this scenario, students hear about good study habits and how the expectation of following best practices after graduating high school. There is no real chance to experience failure other than in the real world. This costs time, money, and motivation. The intent of the game is to provide students an opportunity to fail, or at very least, be challenged by certain scenarios that typically happen in college. This provides a safe environment in which to fail. The debriefing conversation after gameplay will be more meaningful than a traditional lecture because students will have a level of personal motivation to discuss the range of experiences during the game.

Karl Kapp (2015) has furthered the discipline by helping to define what a serious game is: “A serious game is an experience designed using game mechanics and game thinking to educate individuals in a specific content domain” (p. 15). This differentiates itself from simple play in that there is purposeful intent behind what is to be learned. Or, as Clark et al. (2013) stated,

Design, rather than medium alone, predicts learning outcomes. Research on games and game-based learning should thus shift emphasis from the proof-of-concept studies and media comparison analyses to value-added comparisons and cognitive-consequences studies exploring how theoretically-driven design decisions influence learning outcomes for the broad diversity learners within and beyond our classrooms. (p. 14)

It is that purposeful design that differentiates between serious play and normal play. Where this becomes confusing is when the serious play nature is unknown to the players until the “aha moment” after play is complete. This is usually conducted by a moderator who then enlightens the players to a hidden element or theme. An example of this would be in *Train*, where players take on the role of a railway operator and success is measured in how many units the player can ship through the station. Only at the end of the game is it revealed that the player is actually moving people through the Auschwitz Rail Yards (a final destination for many during the Holocaust). The more efficient a player is results in a greater death toll (Romero, 2009).

The nature of motivation leads to a critical distinction between intrinsic and extrinsic. Intrinsic motivation comes from within; when a student wants to do something simply because he or she wants to, that motivation is intrinsic. If an external entity wants the student to do something, their motivation is extrinsic. Games and schools are similar in that they provide an external source of motivation. Schools provide external motivation for learning as games provide external motivation for play. Education and games are similar in that they are both active. The idea of passive education opportunities or passive gaming experiences is limited to fringe occurrences.

Education as a passive process that transfers knowledge between source and destination has diminished as active learning and student-centered research emerges. Education students are not taught how to lecture; they are taught how to engage pupils. Student engagement is identified as a critical element to sustain long-term knowledge retention. Mandatory encounters with knowledge in formal settings does little for the majority of those required to attend each session. As such, educators must identify different ways of presenting the content. Socratic pedagogy inspires teachers to question students until the expected answer is provided.

Likewise, games do not give the answers; instead, they provide the structure and rules in which a player can succeed. If a player is deemed “good” at the game, that player has figured out the rules and uses them to his or her advantage. The player has to learn the game in order to regularly succeed at it. That player is more engaged in the act of discovery because meaning is quickly found. If a player does something correct, an immediate reward follows. Similarly, if a player does something incorrect, negative consequences follow. The feedback loop in games emulate the desired feedback in successful learning environments. If educators explore the way that games train players how to play, they can ascertain that the instruction manual is a lost art. In its place is the tutorial level. Players play, learn, and begin building their knowledge of how to navigate the play space that the developer has created.

Looking at various genres of games, one can understand the need for a game to model the perfect learning environment because there is so much to grasp. Endgame states in most modern big-budget titles require a vast set of player knowledge in order to beat the game. Without a proper feedback loop, it is unlikely that players would know how to succeed.

The game in this research will increase the frequency of the feedback loop for successful college strategies. Playing the game will give students some illusion of ownership over the challenges experienced. It is designed to provoke conversation about the nature and challenges of higher education. This is a traditional board game that will likely be played in a typical classroom environment where a single instructor facilitates play. The analog approach is intended to keep implementation simple and overall cost to implement relatively low. Whereas a digital game requires the hardware to run it on, a board game allows for any flat space to be utilized for play. This should remove a critical barrier to adoption from most high school and college classrooms.

Students will be divided into groups of three or four players who should be able to reasonably complete play within 45 minutes. It is recommended that the instructor demonstrate how to play and have students reflect on expectations during the first session. Students will play the game during the second session. The third, and possibly final session, will include a debriefing with conversation surrounding what expectations were met and what felt unrealistic.

### **The History of Game-Based Learning**

The ability to recognize the value of the repetition of the practice without the element of risk has always been a core idea of serious play. Dirk Wildgruber (2013) published the article titled, “Different Types of Laughter Modulate Connectivity within Distinct Parts of the Laughter Perception Network,” where he describes the nature of tickling and laughter. Wildgruber explains how humans are ticklish in the areas that are most vital to a person’s survival. Children learn very early on how to protect those areas through play. The body basically instructs its owner how to defend areas that are ticklish, which happens to be one’s most vital areas (Wildgruber et al., 2013).

Jane McGonigal has given several talks about the benefits of gaming, but one particular keynote (McGonigal, 2010) discussed the story and the survival of a city. This was a city that endured an epic drought and famine. Citizens played board games (a very stationary activity), and the next day they were allowed to work and eat. The following day, the group would play again. By rotating play with normal daily tasks, the residents of this city were able to survive much longer because they were not burning calories on unnecessary activities.

The drought went on for so long that these citizens decided on a final game where half of the citizens planned to leave. The final game was held, and the winners stayed, while the losers all packed up and left. Genetic research conducted on remains at two sites showed a connection

between this particular village in Greece and another village in Spain. The key in connecting the two peoples with a common ancestry was a very unusual genetic marker that could almost be tied back to the period when this game supposedly took place. Having this game actually influence the culture, migration patterns, and the genetics was very interesting and demonstrated the social influence of play.

Games have existed as long as idle time could be found in societies. Versions of *Go* (Fairbairn, 1995) and chess (Rybina, 1991) date back thousands of years. Nintendo has its roots as a Japanese playing card company that dates back to 1889. The industry of games has been around, the social idea of playing games has existed for most of recorded history, and the idea of play is ingrained into our human psyche.

### **Who Games?**

Students of today have grown up immersed in a gaming world. In her TED talk, Jane McGonigal cites that students will have over 10,000 hours playing games by the time they are 22 years old (McGonigal, 2010.) This means that the students in any classroom are likely to be expertly familiar with the art of learning through failure. Game design has some basic principles on how hard a game should be Mihaly Csikszentmihalyi and his *Theory of Flow* (Csikszentmihalyi, 2009) emulates the learning strategies educators desire to see in their classrooms. If everything is too easy, the player (student) gets bored. If everything is too complex, the player (student) gets frustrated. There needs to be a mix of frustration and success to show a proper scaffolding of progression.

## **Terms**

Gamification and game-based learning are new enough terms that the industry often uses them interchangeably. For the purposes of this dissertation, *gamification* is defined as the introduction of game-like properties into a non-game environment (e.g. adding badges or achievements to a traditional task like reading). *Game-based learning* is defined as using a game to reach a certain learning objective. The game might be made for this purpose, it could be a commercial game that has been modified, or it could be a custom game designed for the purpose of instruction.

## **The Need**

Students looking to enter college are, by nature, at least somewhat successful at high school. During the last 12 years of their primary education, students have learned how to play the game of school. The transition to college learning environments can come as a shock. Strategies that worked in the previous level of education are most likely ineffective in college. The purpose of this proposed game is to give the students a sample of what to expect in the traditional college environment. By providing the students a safe place to fail, learning can occur.

Without this safety net, the first time the students experience challenge may lead to catastrophic failure. College can be very unforgiving; miss a couple classes, grades drop, grades may drop too far, the student earns an academic suspension, and before the student knows what happened, he or she is dismissed from the institution. The wrong social circle, duplication of nonexistent study habits from high school, or poor reading, writing, or math skills could all result in what seems like an impossible barrier to formal education.

When a student plays a game, he or she should never win the first time. It is accepted that there will be challenges but that person will learn, adapt, and overcome those challenges.

Generally, a game designer would not intentionally build an impossible game. Likewise, a game could not be played that allows a player to win every time. Challenge and the possibility of failure are critical. A game designer must give players the tools necessary to succeed, but not hand them an easy win. Similarly, education must ensure it provides students all the tools necessary to succeed. This game is proposed as one of those possible tools available to the teacher. It will not (and should not) guarantee a win or successful college experience, but it should help those who view it as an additional tool.

Some instructors will incorporate this into their class assignments by allowing for 1<sup>st</sup> drafts of papers to be submitted. This approach is very game-like as it allows the student to attempt the assignment at least once before turning in a final product. The iterative process dominates good game design as well as good classroom design. Many times, this draft process is supported by external entities on campus. It is not uncommon for a campus to have a writing or math center to assist students in receiving feedback before their instructor provides any formal assessment.

### **Student Success**

In general, student success is an easy question of completion and employment. Educators want the student to get what he or she wants to get out of it. Most students enter college seeing the next four or five years as a gateway for a better job. If colleges do not provide them that path to more gainful employment, then they are doing it wrong. It is not a realistic approach because success must have the same definition for the institution as well as the student.

The social aspects of the college experience are more of an afterthought. If there was a student who went to college and only earned a degree, that could be considered success. If that student went to school to look for a social network of friends or lifelong partner, it is not the

primary responsibility of the institution. In most cases, the social elements of higher education are almost an expected side-effect. Any time many people of the same peer group are gathered together, by definition, this creates a social circle.

Meeting student expectations of academic and professional development should be included in any definition of student success. From the game standpoint, it would be recognition of what makes a successful student and nearly the inverse of that: recognition of what creates student failure. The game design went more toward this end because it is more fun to play the failure scenario. If students are challenged, that can be fun. This game places students in random situations while maintaining the core mechanics of enrolling in courses and studying.

If a student is motivated, he or she is going to learn. If a student is curious about something, a motivated and engaged student is going to learn. If a student is only interested in memorizing content that is handed to them, he or she will be unlikely to recall that content past the point of assessment. As Chee (2016) states,

The preoccupation with content and discovery of ‘facts’ is disappointing to those concerned with education, where the goals of independent thinking, knowledge creation, critical interrogation, creativity, and innovation role performance – everything antithetical to unthinking adherence to procedural routine – are highly valued. (p. 8)

The value is in the 21<sup>st</sup> century skills, not in the ability to recall and recite content.

## **Learning by Failure**

One of the core principles of game design is that it is an iterative process. It is the value of failure, learning from the experience, modifying the design, trying again, failing, and trying again. Education, is fundamentally different. The current system is set up in a way that is “one and done.” If a student fails, college is over. Even if freedom is explored within a single, well-designed class, there is always a time-sensitive evaluation and endpoint with limited attempts.

The point of this project is to simulate and create an environment of education where a student could fail without drastic consequences. It is not logical to learn serious work in environments where consequences align with the tasks. By allowing for a play state with limited risks, a form of the desired task can be practiced without the possible range of negative outcomes.

According to Jesper Juul in *The Art of Failure* (2013):

We are more likely to search for causes for failure than for causes for success. Whereas success can make us complacent that we have understood the system we are manipulating, failure gives the opportunity to consider why we failed (as long as we accept responsibility for failure). Failure then has the very concrete positive effect of making us see new details and depth in the game that we are playing. (p. 59)

In searching for students to discover a way to reflect and learn from an experience, then failure leads to that path more directly. The first time that students tried using a game controller, they likely experienced failure. There is nothing natural about the skill used to manipulate a game controller to make a character on the screen perform a specific action. The skill to transfer desired actions into actual moves in a game takes time, patience, and hours of practice. While playing a modern game on a computer, it is generally accepted that W, A, S and D are movement keys and the spacebar likely makes a character jump. Among most gamers, this is common knowledge; for anyone else, the connection between keys on the keyboard and actions on the screen would be illogical and only discovered through trial and error. Generally speaking, students agree that they find enough value in succeeding in that task that the time and challenge are not viewed as insurmountable. It is a challenge; it is hard, but not impossible.

Education can learn from that design. Often education can take time, patience, and hours of practice to master any given content. The difference often is that students have no realistic feedback loop to see the payback. Study hard on any given Friday night and in five years from now, a student might be better prepared to answer an interview question. It is difficult to stay

motivated on that type of grand scale, let alone the return on investment at various levels. Games have created a social contract that says if a player masters a certain task, he or she will be instantly rewarded with completion of a level, challenge, or some other game-designed component.

The same concept is observed with curriculum as it is designed to the average student in history, English, and math. However, it is rare to find a student who is average at everything. Students may excel at math but require remediation in English. Maybe that student succeeded in social studies but never mastered the basic concepts of art. Variations of what individual students are good at exist at every institution of higher learning. Rather than having curriculum designed specifically to the average, design instead an adaptable curriculum that fits the needs of every undergraduate student. Education can be modeled after that mindset of designing to adaptability, rather than designing to the average.

In other disciplines where failure is not an option, games and simulations are often used. Military and medical professions are primary examples where a person cannot simply practice in the field (which delineates the individual need to have thousands of hours of experience performing a task that is unlikely to occur thousands of times). In these cases, a doctor or soldier can practice the task in a simulated environment with enough regularity to make the unique become mundane. There is no longer a wait for the unusual to occur to be able to practice for an occasion that calls for a particular skillset.

Likewise, students do not have to wait to experience the challenges that college offers until they can master the environment. By the time students set foot on a college campus, it should be so mundane that they have already mastered the possible challenges that may arise. It

is the job of high school and college to work together to make the transition between educational entities as seamless as possible.

This is a case of students not knowing what they do not know. High school generally rewards effort, is forgiving, and allows for excuses. College can be much less accommodating and there is no reason for students to know this. In high school, they go to class, listen to a lecture, read a book, do homework, and receive excellent grades. Students encounter a very similar environment in college with the exception that when something does not go according to plan (missed a due date, the alarm did not go off, or the student did not understand the assignment), that pupil is not greeted with a second chance, but a failing grade.

Some students identify as “the one who always gets all A’s.” A grade lower than that can shatter self-perception and introduce doubts of even belonging in higher education. Mix an institution with an unforgiving nature with an infinite increase in the amount of personal freedom of students and there is an obvious potential for failure:

Many people give up on learning after they leave school because thirteen or twenty years of extrinsically motivated education is still a source of unpleasant memories. Their attention has been manipulated long enough from the outside by textbooks and teachers, and they have counted graduation as the first day of freedom. (Csikszentmihalyi, 2009, p. 141)

There are numerous lectures that provide general content that students should know about college. Lectures regularly include predictable topics like: “Five Things That Make Students Fail Out of College,” “Eight Things That Successful College Students Do,” and “Time Management and Personal Responsibility.” Most students learn these things through trial and error. The proposed board game features low risk and high reward; it provides a simulated environment that can let prospective or current college freshmen prepare for experience in the field.

After playing this game, the instructor would be able to ask, “What are the five to ten things students have control over that influence the likelihood of success or failure in college?” Further, if the students can recognize that concept, a major hurdle is visualized, opening the door for strategy to overcome it. That topic is currently delivered to them via lecture; it is not a two-way conversation.

Taking a closer look at failure, care must be exercised about how it influences the players’ attitudes. It is completely possible that players become obsessed with winning in such a way that it paralyzes them from even attempting to play the game. A “win” can become expected so much that there is only potential loss when play is attempted. When play starts to mimic the stress of real-world scenarios the game-like qualities that made play possible are diminished. The idea of losing can become so paralyzing that it becomes better to avoid it altogether.

After winning the world chess championship over Spassky in 1972, Bobby Fischer began making a series of increasingly unreasonable demands for future matches, eventually forfeiting his title. According to former world champion Garry Kasparov, the always meticulously prepared Fischer was so afraid of failing that he preferred not to play. (Juul, 2013, p. 123)

While it is unlikely that this type of stress would be intentionally introduced in any academic setting, it is worth acknowledging this phenomenon. If the only potential outcome of a game is negative, why is it being played? If students are academically gifted, it is likely that they are experts at playing the traditional academic game? If a student is asked to try something different but the risk of failing is not mitigated, social buy-in will be minimal as it may be viewed as all risk with minimal reward.

### **Examples of Game-Based Learning in the Classroom**

When a group of students is asked, “How many of you have had teachers that used game-based learning?” almost everyone raises their hand. They will describe some element of play like

a model U.N. (United Nations), sometimes a form of *Jeopardy* in the class, spelling bees, or other common examples.

What is always interesting is the replies from asking, “Why do you remember that particular class?” Nobody knows. Students reply, “It was just something that we did.” When challenged, “Well, what else did you do that year?” they cannot provide any examples. The only memory that a student may have of a class from fourth grade was when their class held a spelling bee. The only memory of high school may be doing a mock U.N. class. That is quite telling; it could be the novelty or the game itself. Usually when a person is in an educational environment, he or she receives information the teacher gives. It is a very passive process. In a game, the outcome is unknown. Another term used to describe most game-based learning is *active learning*. It is something a person does with the information. The simple possession of information is quite meaningless; if nothing is done with it, the student loses. The main difference between the traditional passive educational environment and an active game-based learning environment is the immediacy in which one must apply the knowledge recently obtained. It is not just that the student is exposed to new information, but that information assists in a future challenge.

If a player knows that Mario needs to jump over a Goomba, that does not do them any good unless the player actually jumps over the Goomba. That player must apply the knowledge gained in some way and then are measured on it. If a player is told that to jump over Goombas and then at the end of class the teacher states that players need to jump over Goombas, that closely resembles our current assessment model. As Edgar Dale pointed out with his Cone of Experience, “You remember 10% of what you read, 20% of what you hear, 30% of what you see, 50% of what we see and hear, 70% of what we say, and 90% of what we say and do.” as

cited by (Davis, 2014, n.p.). Or more simply, as Confucius is commonly credited as saying, “I hear and I forget. I see and I remember. I do and I understand.” (No agreed source). The more likely true source is Xun Kuang, a Confucian philosopher, who said, “Not having learned it is not as good as having learned it; having learned it is not as good as having seen it carried out; having seen it is not as good as understanding it; understanding it is not as good as doing it. The development of scholarship is to the extreme of doing it, and that is its end and goal" (Dubs H., 1928, p. 113). Throughout this model, there is an increase from the passive acceptance of information as the absolute lowest level of retention to the active as the highest form of retention.

This model is widely cited and usually displayed as a pyramid. At the top it says, “If I just listen to you, I will retain x%. If I recite it back to you, I will retain x%. If I listen, repeat, apply, do....” But the highest level is always teaching others, which is actually one level beyond usually what gaming does to a certain extent. In ascertaining if someone ever really understands a game, ask them to teach it to someone else. Assessing the ability to teach content is perfect for measurement of knowledge.

That leads down the path that Maria Montessori (Montessori, 2004) followed. Her views on education and how people learn in the social element and the free-flowing nature of it was in reality game-based learning without the games. It provides for ownership, active nature, and a very active-learning environment. Montessori used active learning in that content was discovered through play. Each pupil played the role of expert, student, and explorer over any set of content. Think about this in a traditional environment. Imagine that there are three students; the eldest would be the content master, the second would be the active learner, and the youngest would be introduced to the content for the first time. This type of environment allows every student to experience content three times: first passively, second as the content becomes meaningful, and

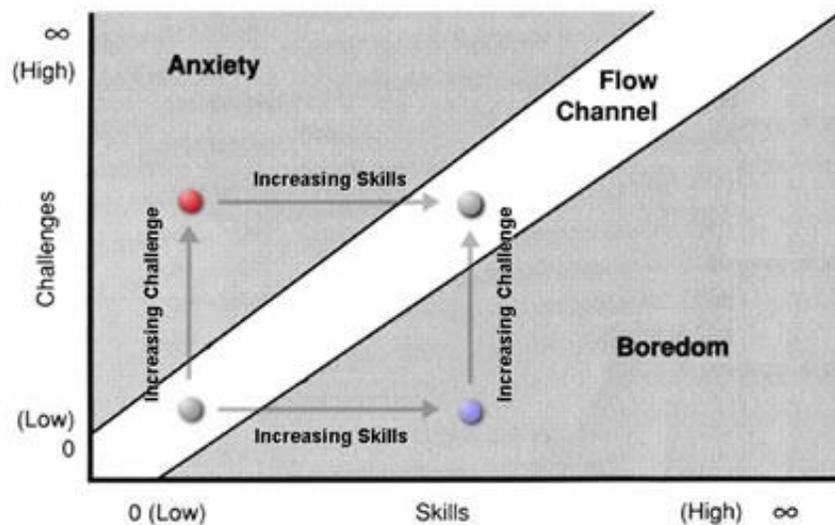
third as the master. By the time the student has become the teacher, their knowledge is not likely to be questioned.

One of the most important caveats about game-based learning or gamification in general is that it is not a silver bullet. Education is known for fads that come and go. Faculty can get a number of students to smile and nod in some ways, but the lecture will always remain. There is something to be said about a very good lecture. Some professors give lectures that truly engage students in the content presented. It is not the intent of this game designer to replace all content delivery or create a singular style of education. Game-based learning exists to augment and engage, not replace.

When a professor has a solid lecture or lesson that covers a given learning objective, that instructor should be told not to change it. If students understand the content, engagement occurs. If students ask good questions and provide feedback, it is a successful learning environment. It is already an active learning environment through the questions an instructor poses, the images displayed, and the examples given. Knowledge is transmitted to the students in a memorable way. A bad game beats a bad lecture, while a good lecture is better than a bad game.

The *state of flow* is the balance between challenging and easy in regard to skill. As time goes on, a particular skill improves. The challenge has to go up; otherwise, it becomes too easy and whatever task a person does becomes boring. Csikszentmihalyi (2009) made a simple diagram slanting up and to the right that shows the perfect state of flow and how it alternates between the challenge and the ease. This wave exists between these states because individuals want to be challenged. If a person does the same repetitive task, boredom occurs. Likewise, if a person is told to do something that is insanely hard, he or she will eventually give up. Thus, the task must obtain this balance. As time progresses, the task must increase in difficulty in order to

maintain the same level of interest. As a person improves at a skill, the task needs to get harder or it will become boring.



Source: Csikszentmihalyi, 2009, p. 74

Figure 2. The Flow Channel

This visual has become a staple in academic, psychology, and game design circles. It represents the “one more turn” mentality strived for in any *Civilization* (Meier, 1991) game or the complete engagement in any similarly defined activity that balances struggle, achievement, and progression. Furthermore, Csikszentmihalyi continues,

Such flow activities have as their primary function the provision of enjoyable experiences. Play, art, pageantry, ritual and sports are some examples. Because of the way they are constructed, they help participants and spectators achieve an ordered state of mind that is highly enjoyable. (p. 72)

Many games have taken this concept into designing difficulty levels; some to the point where the designers actually make it self-correcting. If a player dies too many times in a row, the game makes the level easier. As games apply personal adaptive challenge, academia needs to take note. If a player constantly succeeds, developers must make it harder. If players constantly fail, the game should be made easier. If the student experiences a nice balance of both,

progression to the next level can happen. Similarly, jugglers are prone to say, “If you are not dropping anything, you are not learning.”

Serious-minded games are an emerging topic. As games mature as a medium, there is an emergence of topics once thought taboo for an entertainment venue. A very moving game called *That Dragon Cancer* (Numinous Games, 2016) is about parents whose child has terminal cancer. Like previous forms of expression, games first arrived to entertain; as the medium matures, so does the content. Another example of this genre is called *This War of Mine* (11 Bit Studios, 2014), which is about living through a city under siege. Very early on, the player is put into scenarios where the decision is made whether to steal food or medication. This is not a traditional entertainment game where players steal everything simply because it is there. If a person needs medicine, that player takes it from someone else. Players make moral decisions, not based on power, but ethics. The player’s decisions are always in the subconscious of the avatar to the point of where the character’s avatar talks to the player as an internal voice throughout the entire game. It is the embodiment of regret or remorse, but players can conduct themselves in the game ethically and starve. Others can play it and die of a very basic staph infection. Games such as these specifically address many heavy topics in very meaningful ways.

One unusual discipline that is part of this conversation is health care. Health care is about healthy habits, so when talking about changing habits, it is about changing a particular behavior. Gamification is a strategy used to address healthy behaviors. The positive elements in this conversation are embodied in the Games for Change conference (Games for Change, 2018). There, games designed to improve everything from self to the world are celebrated. The negative elements of this practice of behavioral change is found in the design of games that address addiction.

An interesting question is if those in authority could make a game mandatory. Does the voluntary nature of play need to carry over to receive the benefits of gamification? Can the motivation inherent in games be made beneficial by targeting the activity into something that is known to help? Could these motivational games be used for the wrong reasons? It seems to be an obvious yes. If one considers the typical reward cards offered by casinos, the behavior being rewarded is not in the best interest of patrons.

When further researching the use of games for unethical results, there exists current examples of using games to motivate acceptable behavior. A series on YouTube called Extra Credits (Extra Credits, 2012) has a plethora of episodes on various game-based learning elements. In one of their more eye-opening releases entitled *Propaganda Games: Sesame Credit – The True Danger of Gamification* (Extra Credits, Dec. 16, 2015), the video provides a segment on how China has started to gamify good citizenship.

China has created a citizenship score measuring various aspects of what makes a good citizen. Government officials have taken their country's version of Facebook, combined it with their version of Amazon, to measure purchasing and social posts to give users a citizenship score. Currently, it does not hurt people in this iteration as it is reward-based. If one collects so many good citizenship points, it might translate to a reward of primary travel privileges domestically or it might be easier to travel abroad. The program unlocks certain rewards (Hatton, 2015).

At the time of publication of this dissertation, the program is voluntary. Once it becomes mandatory, everyone will be issued a citizenship score and penalties will be introduced. However, it gets rather devious in the influence of individual scores based on those of their friends. If a friend's score is low, it brings down an individual's score as well. People are then

left with the option of either trying to help their friend be a better citizen or use the option to unfriend them on the social media platform. This creates a social peer pressure, making Big Brother more like Big Neighbor. It is not a stretch of the imagination to see social influence coming from peers because they do not want their own scores lowered.

This is the dark side of gamification that uses games for change to influence behavior to what anyone in power might want, versus what might be for the betterment of humanity. What is happening in China is an interesting element of this that has not manifested outside of an Orwellian dystopia.

## **Summary**

Games are encountered in different settings. They are tools used to engage an end user in performing a task. Often these tasks are meaningless outside of the game environment, but players still perceive accomplishment when they beat a challenge. It is this sense of engagement *enRolloed* looks to capture. The traditional classroom provides content without engagement; it is the primary goal of this instance of game-based learning to flip that experience. If a player is engaged, the content will seem to have a nature draw. The role of content provider is no longer isolated to the instructor. As the instructor changes from purveyor of content to engagement conductor, the student transforms from content receptacle to partner in exploration.

## CHAPTER TWO: LITERATURE REVIEW

### Introduction

Engagement finds itself at the intersection of game design and education design. In this chapter, several core elements of both design philosophies will be compared and contrasted. The design of educational experiences has a well-researched history and the discipline of instruction has matured over the centuries. Content experts have debated, researched, and refined the art of learning over countless student bodies at the individual, class, and national levels. Games have a history almost as rich, but the concept of a professional game designer is relatively new, with only serious attention as a discipline emerging in recent decades. While education can walk back to Socrates or Aristotle debating how people learn, game designers have only begun to explore how to engage players in recent history. Until games reached mass consumer markets, they fell into the hobby realm with limited numbers of people paying attention to how to make games better. With the hypercompetitive marketplace that games have created, a form of Darwinist survival has emerged where only the best games are profitable or memorable. That leads to individuals studying what makes games successful, and thus, a multi-billion-dollar industry has emerged where a very limited offering once stood.

This chapter will also explore research methods and publication practices that encompass the game-based learning discipline. As previously stated, these practices are well known and established for other disciplines yet are missing in the academic conversation focused on game-based learning. Case studies, small qualitative studies, and limited rigor dominate this research landscape. While these types of studies can add to the conversation, their validity and

replicability should be scrutinized further. It does not help that the journals publishing these studies are as vastly different as the studies themselves. While one journal requires a conversation with the editor, another demands a double-blind peer review.

The Association of American University Presses released a guide in 2016 called the *AAUP Handbook: Best Practices for Peer Review* (AAUP Handbook, 2016). As stated in the preamble, “The purpose of this document, written by the AAUP Acquisitions Editorial Committee, is to articulate a set of practices that comprise a rigorous process of peer review” (n.p.). The audience for this publication is acquisitions editors for various publications. The handbook covers everything from why peer review is important through recommendation on the entire peer review process. It begins with a short statement of why peer review is important:

Peer review is essential to the university press mission of advancing and disseminating scholarship. Peer review is the process through which university press editors’ commission formal evaluations from respected experts (‘peers’) on the contribution to scholarship, teaching, and public debate of a work being considered for publication. These formal evaluations are considered by press staff and shared and discussed with authors as a crucial prepublication step in an editor’s evaluation of the merits of proposed projects. (AAUP Handbook, 2016, n.p.).

It is with this frame of reference that evaluation of several game-based learning journals’ practices and procedures for accepting publications is necessary. This will be done directly through a review of the details published about the process and an analysis of relevant articles published in most current publications.

### **Meta-Analysis of Game-Based Learning Publication Requirements**

For this overview of game-based learning publications, six different journals and their methodologies for reviewing articles will be explored. The journals include *Analog Game Studies*, *International Journal of Game-Based Learning*, *Journal of Game-Supported Interactive*

*Learning, American Journal of Play, Simulation & Gaming, and the International Journal of Serious Games.*

*Analog Game Studies* (AGS) is, "...dedicated to the academic and popular study of games containing a substantial analog component" (Analog Game Studies, 2015). The focus of this journal is further defined as seeking, "Scholarship on role-playing games, traditional games (chess, go, backgammon), parlor games, strategy board games, collectible card games, larp and similar material will be the central focus of our journal" (n.p.). This focus offers a unique cross-discipline view into game-based learning as it is less concerned with the content area and more with the method of delivery. This is common to see with video games. For example, the Higher Education Video Game Alliance (HEVGA) is dedicated to the advancement of using video games in education. HEVGA states part of their mission as, "to create a platform for higher education leaders which will underscore the cultural, scientific, and economic importance of video game programs in colleges and universities" (HEVGA, n.d., n.p.).

As the project of this research is the creation of an analog board game, the *Analog Game Studies* (AGS) publication is a primary venue for future publication efforts. It is with that bias that the critique of their methodology begins. The Editorial Process published by AGS is self-described as an "open-yet-curatorial model" (Analog Game Studies, n.d., n.p.). To further define the process, "We see this process as a collaborative, expressive, and open conversation between editor and author" (n.p.). Nothing about their process indicates that the review of submissions is anything but internal to the editorial board. This limits the potential reviewers to four individuals on the editorial board.

The *International Journal of Game-Based Learning* (IJGBL) has published research quarterly since 2011 (IJGBL, n.d.). Their mission is to

...promote knowledge pertinent to the design of Game-Based Learning environments, and to provide relevant theoretical frameworks and the latest empirical research findings in the field of Game-Based Learning. The main goals of IJGBL are to identify, explain, and improve the interaction between learning outcomes and motivation in video games, and to promote best practices for the integration of video games in instructional settings. (IJGBL, n.d., n.p.).

Similar to the *Analog Game Studies*, this publication is content agnostic; it is concerned with the game-based learning methodology and not specifically the content it presents.

IJGBL states that the coverage for the journal will be:

- Adaptive games design for Game-Based Learning
- Design of educational games for people with disabilities
- Educational video games and learning management systems
- Game design models and design patterns for Game-Based Learning
- Instructional design for Game-Based Learning
- Integration and deployment of video games in the classroom
- Intelligent tutoring systems and Game-Based Learning
- Learning by designing and developing video games
- Learning styles, behaviors and personalities in educational video games
- Mobile development and augmented reality for Game-Based Learning
- Motivation, audio and emotions in educational video games
- Role of instructors
- Virtual worlds and Game-Based Learning (IJGBL, n.d.)

The process for peer review for the IJGBL appears rigorous. IGI Global outlines the process in a short video at <https://www.youtube.com/watch?v=LCrIFHgQXvc> (IGI Global, 2017). This publication features a double-blind peer review process that usually takes 12 - 16

weeks. IGI Global is an international publisher of academic content. IGI Global publishes over 175 journals (IGI Global, n.d.) and the process is standardized for most, if not all their publications. This particular journal focuses on digital games, though the general topic and conversation would provide a rigorous venue for future findings of research based on *enRolled*.

The *Game-Supported Interactive Learning Journal* is a peer-reviewed journal that features “the examination of the relationships between interactive learning and game studies across a wide range of perspectives and settings, theoretical, different methodological approaches” (MacroWorld, n.d., para. 3). While this journal lists its scope as international, the editorial board is almost exclusively based within the United States. The journal describes the peer review process as follows: “The manuscripts which are scanned by the editorial board are sent to three referees for evaluation in terms of form and content. The manuscripts that are considered, at least by two referees, issuable are put in line for publication” (MacroWorld, n.d., para. 3). This brief description outlines the best practices for the publication of peer-reviewed research. However, the lack of detail requires that the actual implementation of the process is in question.

The *American Journal of Play* (n.d.) is self-described as a:

peer-reviewed and written in a straightforward style for wide readership of educators, psychologists, play therapists, sociologists, anthropologists, folklorists, historians, museum professionals, toy and game designers, policy makers, and others who consider play for a variety of reasons and from various perspectives. (Para. 2)

The *American Journal of Play* is published by The Strong National Museum of Play (The Strong National Museum of Play, 2016). This foundation and process of publication gives the *American Journal of Play* a source of credibility lacking in most other journals. The non-profit nature of this organization and the open nature of its content makes validity of the content easy to review.

The *American Journal of Play* started in Spring 2009 and has provided a platform for continued research and publication of game-based learning content.

*Simulation & Gaming Journal* (Simulation & Gaming, n.d.) has a rich history of publications in the topic of game-based learning. The first publication in March of 1970 featured titles like “Using Simulation Games in College Courses” (Boocock, 1970). The process used to review the articles only reinforces the quality. The Manuscript Submission Guideline highlights the following Peer Review Policy:

S&G employs a double-blind peer review process for at least the first round of reviews. Additional reviews may be required at the discretion of the managing editor. Our goal is to provide authors with feedback on their article within 50 days. The editors in chief reserve the right to desk-reject or un-submit any article that they feel is not properly prepared, not a good fit for the journal, lacks quality, fails to contribute to the literature, lacks originality, or is not written in a clear, scholarly manner. (Para. 3)

The *International Journal of Serious Games* (n.d.) is likewise dedicated to the peer-reviewed process. The trend in game-based learning journals embraces this tried and true methodology to encourage a more thorough process. As with other journals in this pedagogical arena, it does not limit the content area, but instead focuses on the methods of engaging students within various disciplines. This journal goes into depth about the review process, citing the “COPE Ethical Guidelines for Peer Reviewers” (Committee on Publication Ethics, 2018) and the “COPE Code of Conduct and Best Practices Guidelines” (Committee on Publication Ethics, 2017).

## **Research Critique**

As the meta-analysis began with the *Analog Game Studies Journal*, it is only fitting to critique one of their latest publications. In the recent article titled “Sneak Attack Anthropology: Experiences with Games in the College Classroom” (Loebenberg, 2018), it features a casual

conversation about a single instructor's use of a role-playing game system in two classes. Abby Loebenberg writes about her use of the role-playing system called GURPS (Generic Universal Role Playing System) by Steve Jackson Games (GURPS, n.d.). The biography of Dr. Loebenberg includes vague references to other publications in peer-reviewed journals, and her PhD is from the University of Oxford, so there is a reasonable expectation of an understanding of the value of the peer-review process. However, this particular publication appears to dismiss that understanding. This adds limited value to the conversation of game-based learning, as it mentions nothing else but a few choice statements from students talking about the experience.

Considering the previous examination of the process for the *Analog Game Studies Journal*, the goal is not to enforce any peer-review process, but instead to add conversation to the background of game-based learning research. The rigor of this particular article aligns with the expectations of the journal. Details missing from the academic conversation are numerous but can be quickly summarized as this is missing a control group. Also missing are any data on the sample size, student population, IRB approval, and instructor bias. While notable, this is nothing more than a casually interesting lesson plan for teaching ethnographic writing to an honors class at Arizona State University.

Bradley Wiggins published his article, "An Overview and Study on the Use of Games, Simulations, and Gamification in Higher Education" (Wiggins, 2016) in the *International Journal of Game-Based Learning*. The methodology clearly defines six research questions, while the survey design and results are presented in easy to find language. Participants are localized to full and part-time communication instructors of higher education in Arkansas. The author states that this targets a possible 151 individuals, and of those, 48 replied to the survey. This population is not only specialized, but also localized. Nothing up to this point limited the conversation of the

research to a single academic discipline or geographic location. The author draws general conclusions from the data provided by these surveys and applies it to a more global viewpoint. While the data is interesting, it only addresses the research questions in a localized and specialized population.

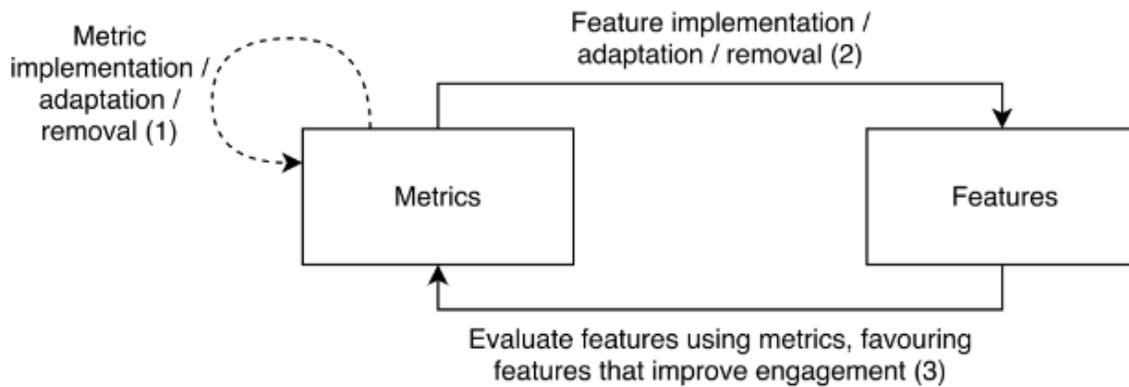
One intriguing point relating to the development and creation of *enRolled* is that the 48 higher education communication instructors surveyed in Arkansas self-reported a dominant use of non-digital games in their classroom. As shown in the publication, non-digital game use was at 56%, digital game use was 27%, and use of neither was at 17% (Wiggins, B, 2016).

“Encouraging Engagement in Game-Based Learning” (Whitton, 2011) likewise published in the *International Journal of Game-Based Learning*, sounds like something that would directly relate to the research presented here. However, the author fails to deliver on so many details that readers are left with more questions than those initially asked. Of particular interest is the complete lack of engagement in the game they designed. The study proposed creating a game that would replace a traditional student orientation. Initially, 173 players registered; of those players who registered, only five players (3%) actively engaged with the game. Readers of this article are left not knowing how the game was designed. From a game design perspective, this is a complete failure of player engagement as it has nothing to do with the academic nature or content presented, but everything to do with play testing and game design. If anything, this article simply reinforces that game design is a discipline that should be consulted when designing games for academic use.

A recent article in the *American Journal of Play* featured a study about the possible influence of play and creativity in the workplace (West, Hoff, & Carlsson, 2016). Titled, “Play and Productivity: Enhancing the Creative Climate at Workplace Meetings with Play Cues,” the

researchers set out to observe the influence of play cues on an otherwise traditional business meeting. Within the details of the article, clear methodology and a critical reflection on the potential limitations for the research are present. While the authors identify the sample of convenience as a potential problem, they also create a control group within the same sample. The intervention group consisted of 123 individuals in 13 meetings while the control group consisted of 41 individuals in five meetings. The bias of this population was presented to the reader and the technique for analysis was clearly stated. Given time and resources, other researchers could replicate this study.

In their findings, West et al. (2016) show an increase in self-reported creativity, playfulness, and productivity in the intervention groups. It would be an interesting venue of research to try and replicate this in a classroom environment.



Source: Atkins, A., Wanick, V., & Wills, G., 2017, p. 7

*Figure 3: Metrics Feedback Cycle*

Adam Atkins, Vanissa Wanick, and Gary Wills (2017) offer the Metrics Feedback Cycle as the primary thing of value in the article “Metrics Feedback Cycle: measuring and improving user engagement in gamified eLearning systems.” As they state in their conclusion, “The main

contribution of this paper is the Metrics Feedback Cycle (MFC), which is a unique and formal definition of a process for iteratively improving engagement within an application, by using metrics data to systematically improve engagement” (p. 7). From a critical eye, this unique and formal process looks like many iterative design processes. Mainly, interaction is measured, and then additional support or resources are added to areas that show use. Areas indicating little interaction are eliminated or reevaluated.

Their findings were confusing and written in ways that call into question the entire study. “0 shows that 64.3% of the error messages were displayed for over 5 seconds on screen, indicating that most users engaged with the error message, and found them useful” (Atkins, Wanick, & Wills, 2017, p. 15). In this case, Figure 10 is often referred to as “0” in the article. Beyond that, a delay in clicking a popup message from a website should never be a measurement of engagement, nor any form of perceived usefulness. Considering the flawed measurement of engagement, the entire methodology of the study should be called into question.

## **Game Design**

Before discussing game design, a definition of what a game is should be established.

Elizabeth Bartels (2016) offers this definition:

I argue that a game is an instantiation of a model in which key independent variables (or inputs), dependent variables (or outputs), or both are human decisions. Based on this rendering, games can also broadly be conceived as having three elements: environment, roles, and rules. The environment describes the tangible or intangible landscape that will be affected by the model. The actor (or more often actors) are the decision-making entities attempting to affect the environment, which the game’s players will represent through the roles that are assigned to them. Finally, the rules lay out the causal mechanisms by which the actor can make decisions and how those decisions will impact the environment. (p. 503)

Games are often discussed in generalities; there is no single best game for all players, or best game design method. Game ideas can emerge from childlike boredom and be developed spontaneously, or they can have a purposeful design path that takes years to develop and millions of dollars to support. Individuals like Markus Persson (also known as “Notch”) can design games like *Minecraft*; inversely, million-dollar game companies like 38 Studios can fail to deliver a long-promised game. In 2014, Persson sold *Minecraft* to Microsoft for \$2.5 billion dollars (Lapowsky, 2014). In contrast, 38 Studios declared bankruptcy in 2012 (Schwartz, 2016).

As with any other medium, games can exist for the sole purpose of artistic expression. A game can be enjoyed by a single individual or be consumed by the mass market. The game can be designed to draw out emotional responses from players or simply provide the illusion of progression. It is with this vast definition that this author will try to frame the conversation of game design into smaller generalizations that apply to most gaming experiences. One thing for certain is that games have entered the global arena; they influence more decisions than people consciously realize.

If it is accepted that play is a voluntary experience, as Johan Huizinga so eloquently states in *Homo Ludens* (Huizinga, 2014), then designers must recognize that without engagement, players would not voluntarily continue playing a game. Unlike the recent parody album Alfred Yankovic offers us, fun cannot be mandatory (Yankovic, 2014). Engagement is the engine that keeps players and games together. As such, methods of engaging players have a plethora of research behind it. Consider the operant conditioning chamber (also known as a Skinner Box), early research from the 1930s on how behavior can be shaped. B.F. Skinner proved that certain reinforcing methods were better at shaping behavior (Skinner, 1953). Game designers have embraced this research and use similar behavior shaping methods to encourage

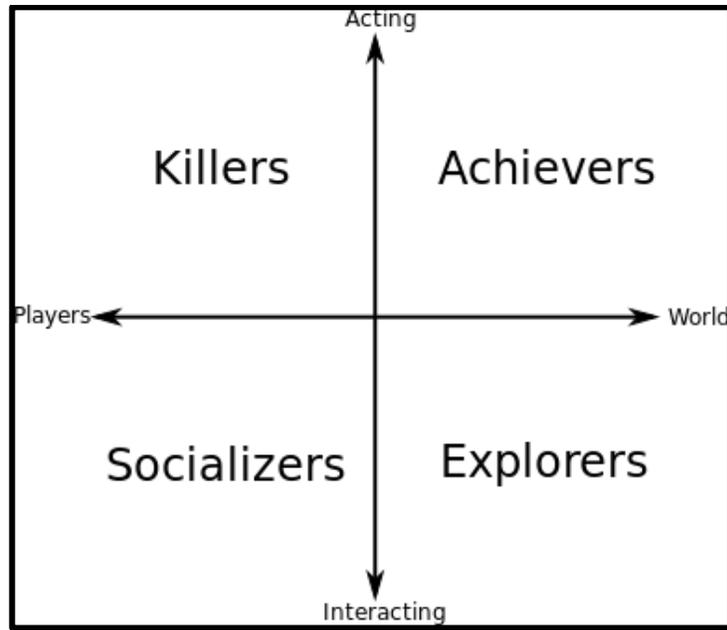
play. As stated in the article titled “Behavioral Game Design,” (Hopson, 2001), it can be observed that even as early as 2001, game designers embraced basic psychology to motivate players.

The game *Farmville*, by Zynga, is infamously known for being nothing but a glorified psychology experiment (Zynga, 2009). The actual game elements are dwarfed by the psychological conditioning effects used to keep players engaged. In his article “The Zynga Abyss,” Benjamin Jackson (2012) stated,

They take advantage of gamers’ completion urge by prominently displaying progress bars that encourage leveling up. They randomly time rewards, much like slot machines time payouts to keep players coming back, even when their net gain is negative... These techniques can be used in any sort of game, in any context. (Para. 9)

More recently, these player motivation elements can be observed in games like *Candy Crush* (King, 2012), *Angry Birds* (Rovio Entertainment, 2009) and *PokemonGO* (Niantic, 2016). The idea of leveling up has become so pervasive it can even be experienced in the app, *Ultimate Cribbage* (WildCard Games Inc., 2017), where daily challenges and player level progression is included in the classic card game of cribbage.

Richard Bartle (1996) added to the player motivation conversation while working on a Multi-User Dungeon (MUD). He is credited with creating the grid below and the player classifications behind it. The grid is simplistic enough yet defines how different aspects of games motivate players. The two main variables are how players interact with other players and how players interact with the world around them.

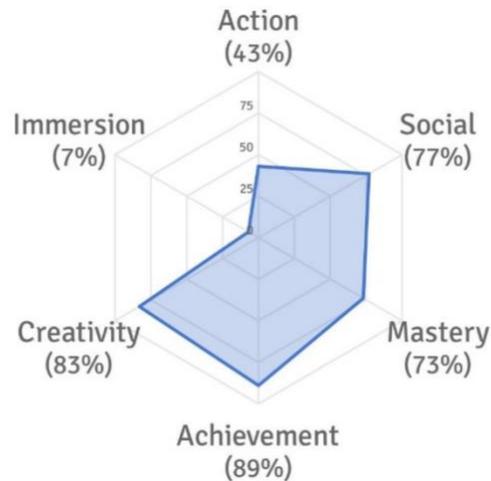


Source: Bartle, 1996

*Figure 4. Bartle's Taxonomy of Player Types*

The north/south axis defines how players interact with other players. If players want to work with other players, they would be on the bottom half of the chart. Interactive game elements might include cooperative missions, guilds, or social elements of a game. If players found more enjoyment in acting upon other players in a competitive manner, they would find their player profile in the top half of the chart. The east/west axis defines how players interact with their environment. If a player wants to interact with other players, he or she would be on the left side of the grid. If a player wants to interact with the world or environment more, that person would be on the right side, respectively.

This model has recently been updated by Quantic Foundry. Titled a *Gamer Motivation Profile*, the new model ranks six motivating factors; action, social, mastery, achievement, creativity, and immersion.



Source: Quantic Foundry, 2015

Figure 5. Quantic Foundry: Gamer Motivation Profile

As players approach their preferred play experience, they are more likely to enter into the *state of flow*. Mihaly Csikszentmihalyi (2009) defined this “Flow Channel” as the optimum player experience for a game. It is a dynamic range based on the challenges presented and the player’s skill. An ideal balance challenges the player but does not let them waver in the anxiety or boredom range for long. An ideal experience path would have the play approach these zones but then stabilize in the center as either challenges or skills increase. This concept has led game designers into adaptive difficulty experiences. If one continuously fails at a given task, it is possible to program a game to make the challenge less difficult. For example, if a player is stuck on a particularly hard level, it would be possible for a game designer to decrease the difficulty of the challenge by a given percent after every failure. This will help the player overcome a repetitive failure scenario, perhaps without any knowledge of the additional ease being given. Education has embraced this same concept, calling it “adaptive testing.” The National Council on Measurement in Education (NCME) defines an adaptive test as, “A computer-administered

test in which the next item or set of items selected to be administered depends on the correctness of the test taker's responses to the most recent items administered" (National Council on Measurement in Education, n.d., n.p.). Csikszentmihalyi identifies four elements that are likely to help players achieve this state of flow (Csikszentmihalyi, 2009). They are

- Have concrete goals with manageable rules,
- Demand actions to achieve goals that fit within the person's capabilities,
- Have clear and timely feedback on performance and goal accomplishment, and
- Diminish extraneous distraction, thus facilitating concentration. (Chapter 4, p. 71-93)

Each of these elements align with the goals of a game designer. Analysis of the inverse of each of these elements reveals obvious factors that should be avoided. This is a fundamental crossover of the design of an educational experience. If a student experiences anything like flow during a designed educational experience, it can be said that the design was successful. If Csikszentmihalyi is viewed as a teacher, he would have designed personal learning experiences with rubrics, immediate feedback, and minimal distractions. When optimal engagement is the goal, game designers have a similar skillset as educators. Both design an experience that want the player (or student) engaged.

Removing any element that Csikszentmihalyi highlights would be catastrophic. While there might be a time and a place to prioritize certain elements, as a rule, all must be present. Removing clear and timely feedback from the equation would result in players (or students) wandering around the experience, wondering if they are successful. Without concrete goals, a player/student does not know what to attempt. Without demanding action that is within a person's capabilities, a feeling of hopelessness is established. Finally, without removing distractions, a student/player is left to wander. These elements are all requirements; none is more important than the others, as all must be present. In analyzing the recommendations for game design, parallels to education design can be drawn.

Another example of crossovers between game design and education design is the ability to learn through failure. As digital games emerged into the mass market, designers were challenged with teaching people how to play their games. Early games included a printed manual, but those were often ignored in favor of playing the game and learning through experience. In an interview with Shigeru Miyamoto, the designer of Super Mario Brothers (Eurogamer, 2015), he states:

We wanted to figure out a way for players to be really satisfied with the bigger Mario and so that's actually why we created this small Mario first. If a suspicious enemy appears the player will need to jump over it. And, again, if we have a question block, they might want to try and tap that as well. When they see a coin, it'll make them happy and they'll want to try again. But by being hit (by the mushroom) you become bigger, and that makes you feel really happy. We kept simulating what the player would do so even within that one section we knew that the player would understand the general concept of what Mario is supposed to be and what the game is about. (Video 0:26 – 1:23)

The perfection of World 1-1 in Super Mario Brothers is that within the first couple of seconds of the game, players already understand the foundation on which the rest of the game is based. As the game progresses, additional challenges are introduced and player knowledge and skills scaffold upon previous success.

Progression into the modern world of gaming indicates how critical this concept becomes. Endgame environments for modern games can become so complex that to try and learn them through any method other than experience would be tedious at best. If the game was not viewed as the primary method of instruction, players would be lost or frustrated about how to progress. If players were first presented with all the complexity present at the final stage of the game, they would be easily overwhelmed. Yet, through experience, trial and error, and feedback, players are able to progress to levels beyond their own expectations. This compares to giving students a final exam on the first day of class; it would be unrealistic to expect anything but

failure. The ideal strategy is to build upon small successes until they are considered boring and then introduce new challenges that requires previous skill or knowledge.

Learning through failure implies that there are some critical elements of instruction. In order to fail, a player must know that he or she did something wrong or incorrectly. This means that the game designer must include timely feedback to the player. If a player makes a mistake and the repercussions of that error are not ascertained for a lengthy time, any negative consequence will not be associated with the incorrect action. Game designers build in feedback loops to reinforce correct behavior or punish incorrect behavior. This should bring up a familiar image to the classical conditioning referenced earlier in the chapter regarding the Skinner box. Extrapolating this to the classroom, it would be similar to the teacher who does not grade papers until halfway into the semester. A student is ignorant of doing anything wrong should be expected to repeat the same mistake.

Referencing the Super Mario Brothers game once again, there are examples of immediate feedback for each action. If the player does nothing, a small enemy will eventually reach the player and cause the level to restart, with sad animations and sounds to reinforce that the player used was a bad strategy. However, if the player successfully hits the question mark block, jumps on the enemy, or runs into the mushroom, the score is increased and happy sound effects play. Players are given immediate feedback to their actions and know that if they want to continue to succeed, they must execute similar actions.

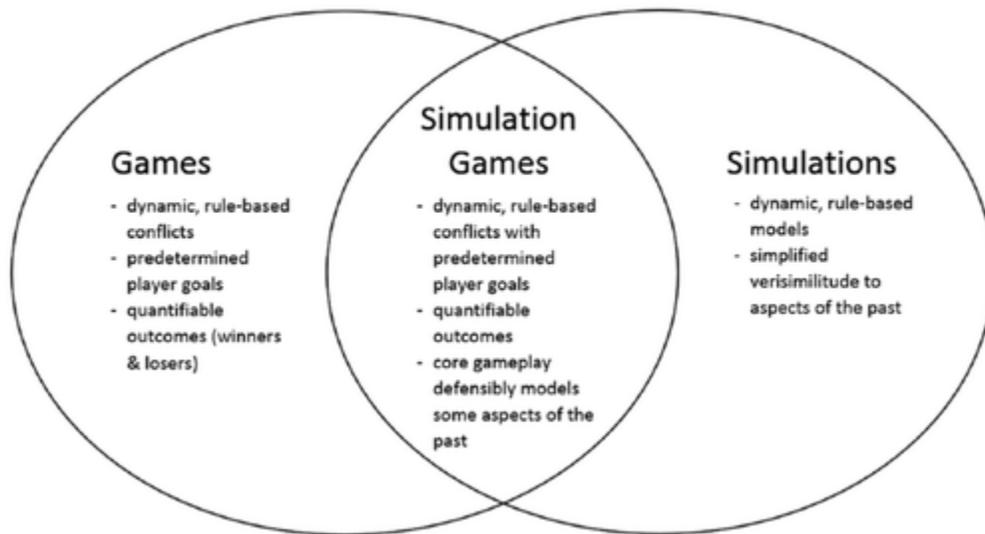
Researchers have observed that players often learn through environments of play. This is sometimes referred to as *collateral learning*. For example, a game takes place in a certain environment and players learn about that environment through exposure. Similarly, a trait of the game requires real-world knowledge that is reinforced through play, such as in *Minecraft*

(Mojang, 2009). One of the rare stones in this game is obsidian; as is in nature, this usually forms when lava meets with water. Likewise, if players ever find lava and water in proximity to each other, obsidian is likely located between them. Another example of collateral learning is the game series *Assassin's Creed* (Ubisoft, 2007). In this instance, the player travels through time and encounters realistic historic settings. Alternatively, a game like *Battlefield 1942* (DICE, 2002) gives players a deeper understanding of the critical battles in World War II. While players might not understand the full depth that a rigorous approach to studying the war would provide, they will at least have a surface level understanding. Using a more traditional example, players of the board game *Risk* (Hasbro, 1957) are quite often better versed in basic global geography as they have spent countless hours staring at a world map.

This experiential or collateral learning is vastly different from early attempts of game-based learning. Games that added a layer of education onto an existing game would be introduced to classrooms with minimal success. Imagine that aliens are attacking and the only way to shoot them is to complete basic math problems (Math Blaster! 1983). Another example would be a race to finish typing words on the screen to improve typing skills. Having a traditional game interrupted to complete homework problems in order to unlock additional play time may sound familiar. These iterations of game-based learning have come to be called, “chocolate covered broccoli” (Farber, 2014, p. 34). It is taking something a person likes, such as chocolate, and putting it all over something stereotypically not enjoyed, namely broccoli. This combination results in an amalgamation that is the worst of both worlds, the creation of something unpalatable.

The challenge with forcing too much predetermination on a game is that it becomes a simulation. If players are engaged in a World War II game and they assassinate Adolf Hitler in

1939, a strong argument exists that they have not learned history. Jeremiah McCall (2012) often publishes about the difference between simulations, games, and the hybrid that exists between the two. He provides the following clarification:



Source: McCall, 2016

*Figure 6. Games, Simulations, and Simulation Games*

While it is not the goal of the game itself, McCall explains how *Assassin's Creed* leads students to gain knowledge through the setting itself. "Assassin's Creed is often praised for its lavish use of authentic period architecture, clothing, and characters. The player travels by way of reconstructed streets and rooftops from historical cities and can even converse with certain historical figures" (McCall, 2016, p. 519). The game designers did not set out to create a game that teaches players about a given time period, but as students spend time in that environment, the historical context is reinforced. Instead, they have created an engaging environment and players embrace the content, gaining knowledge with further time on task. If the developer creates an engaging environment, the players will naturally want to know more about it.

Curiosity then acts as the catalyst for encouraging players to learn more about the environment in which they immerse themselves.

## **Education Design**

Marc Prensky perfectly describes educational scaffolding when he talks about engagement in his book, *Don't Bother Me Mom -- I'm Learning!* (2006). He states,

One of the most important features of complex games, and the one most often cited by players whom I talk to, is feeling themselves getting better! The method game designers have devised to let players know this is happening is called “leveling up.” (p. 59)

Game designer Will Wright has a similar approach to game design. While education designers talk about a student-centered approach to learning, Wright designs games with a player centered approach. In a 2005 Game Developers Conference session, Wright is quoted as saying, “Instead of Luke Skywalker or Bilbo Baggins, I wanted to put the player in the role of George Lucas... or J.R.R. Tolkien” (Diamante, 2005, n.p.). This aligns with the student-centered approach that is currently trending in education. Give students ownership of the content and path to mastery; rather than treating them as a uniform participant, give them the authority to construct the story.

Similarly, transfer of ownership is observed in the classroom designed by Maria Montessori. Her revolutionary stance put children as the directors of their education. A child would play the role of explorer, learner, and teacher for any given content. As such, that student would have three chances to encounter the content and master it, all from the perspective of their personal interest (Montessori, 2004). If a student shows up with subject matter that he or she wants to learn, the instructor can shape the content focus to meet any existing learning objectives. The challenge is in getting the student engaged. When students are allowed to provide

the engagement, the instructor only needs to provide direction. This environment contradicts the standards-obsessed classrooms of today.

### **Game-Based Learning Examples**

The extraction of engagement elements from games and layering them upon traditional activities gives us the term *gamification*. This is in stark contrast to the focus of game-based learning where the game itself is part of the learning process. The difference is between content and engagement. Gamification takes the engaging elements of a game and puts it in a learning environment. Some examples of this concept are leaderboards, badges, or a leveling system. Game-based learning uses a game to provide the content. Some examples might be *Kerbal Space Program* (Squad, 2015), *GeoGuesser* (Wallén, 2013), or *iCivics* (iCivics, 2010).

*Kerbal Space Program* (Squad, 2015) is a game that places the player as the head of an alien space program. Tiered goals have the player designing spaceships to meet certain challenges. In each case, if a player is given little instruction, the mission will most likely end in failure. However, the scope of each challenge is within grasp of the player's effort; failure is accepted and winning is fully embraced. Each success builds upon the previous mission and adds new elements. Players engage with the game before they know they are figuring out thrust-to-weight ratios using realistic physics.

While not specifically designed for the classroom, *Minecraft* (Persson, 2009) has found a place in the modern revolution of academia. For those unfamiliar with the game, *Minecraft* is referred to as a *sandbox game*. It is an environment that has minimal direct goals and leaves players to figure out what they want to do. This has created a loyal community of players who treat the game as a sandbox. Creating everything from a survival world, to a farming simulator, to an engineer's playground. This vast malleability has allowed educators to take the platform

and shape it to their classroom. Microsoft has even officially supported these efforts with the purchase of the *MinecraftEDU* expansion and offers formal support. TeacherGaming LLC was formed when Joel Levin, “The Minecraft Teacher,” co-created a supported educational modification to the original platform before Microsoft purchased the software (Levin, 2011). This modification allowed teachers to control the play experience in an otherwise open sandbox environment (limiting or granting resources, enabling or disabling game functionality). Curriculums have been developed to support multiple state and national K-12 standards (MinecraftEDU Lessons, 2017). Using the game, teachers are able to better engage their students. The environment can introduce a vast array of topics like math, physics, geography, social studies, or environmentalism.

This is vastly different from the *Oregon Trail* (Gameloft, 1971), an education game that Generation X grew up playing. *Oregon Trail* stood out because it was a single option of an actual game in an educational system still trying to figure out what an educational game was. One could actually play *Oregon Trail*. A player could win, lose, have a high score, or fail horribly, all based on the decisions made combined with a little luck. This was a fundamental shift from educational games at the time where the only way to achieve a high score was to master some obviously educational content.

Games in the classroom have risen in popularity with the resurgence of tabletop gaming. As gaming reaches a broader audience, it is only logical these would be included in classrooms. Games like *SimCityEDU* (GlassLab Games, 2013) were designed similarly to *MinecraftEDU* in that it provided a sandbox to engage players. Typically, academic exercises give a uniform situation and then a neat and organized discussion about those situations. What the gaming variable introduces is a vast array of situations that engage the student and then a discussion with

less prescribed endpoints. Take an obvious discussion topic like pollution. Everyone wants less pollution. However, if students play the game, they might see that pollution exists because it allows business to grow faster, and people are generally happier when they are economically successful. This shifts the entire discussion from “pollution is bad,” to exploring the causes of pollution. The shift is subtle, but the engagement level is increased. The classroom shifts from an environment where the student is told an answer into a fuzzy arena where debate is not only expected but required.

*iCivics* (iCivics, 2010), *The Radix Endeavor* (MIT Game Lab, 2013), and *GeoGuessr* (Wallén, 2013) have added to the library of games with obvious academic ties. *iCivics* could be included in any social studies classroom. The game development process was conducted with the classroom in mind, so much so, that actual lesson plans exist to support teachers using the game. *The Radix Endeavor* was designed to be included in a middle school biology or math curriculum. *GeoGuessr* belongs in any geography classroom that talks about the different environments on earth. These games are not designed to replace the teacher but are instead designed to engage students. Engaged students make a teacher’s job easier as the teacher no longer has to try and force learning on students, instead guiding them in the quest for more knowledge.

It is common to find games in the classroom that are clearly designed by professional educators and not game designers. Games that are clearly variants of *Trivial Pursuit*, *Jeopardy*, or a basic “roll dice, move piece” mechanic are minimally defined as modern or engaging games. Without meaningful choice designed into the gameplay, players rely on chance to progress. Similarly, trivia games are an alternate version of a traditional review or multiple-choice test with some basic elements of gamification added to them. One such example is “University Challenges” (Leeds Games Group., n.d.). In this game, students roll a die and move around the

board, answering questions about the university. If the questions are answered correctly, the players earn a particular value of credits. Players can turn in 20 credits to earn a wedge and must collect six wedges to complete the game. Halfway around the board players are halted if they have not collected three wedges. If players roll a 1 on the die, they are to roll again.



Source: Leeds Games Group., n.d.

*Figure 7. University Challenges*

This game was designed with good intentions, but the analysis of it from a game design perspective is challenging at least. This is exactly the modified version of *Trivial Pursuit* and *Jeopardy* that one would expect to find in a traditional classroom. The game elements (dice, board, pies, wedges, and credits) could be removed, the cards shuffled, and read to teams with the same results. The first team to earn 120 points wins. The ‘play’ part of this game is trivial. There are no choices to be made, winning is based on luck and knowledge of the university and surrounding area.

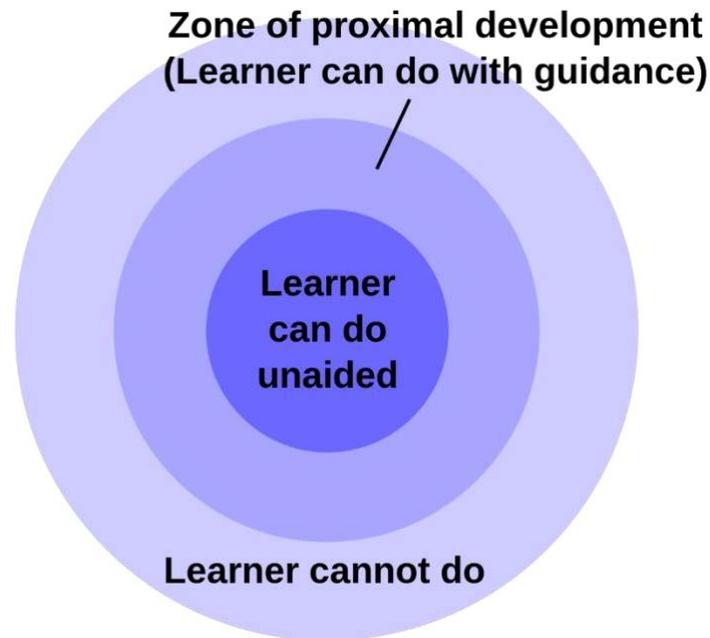
While not a specific game, David Simkins (2015) researches the academic and social value of live action role playing (LARP) games.

Games that offer a participant the opportunity to practice a first-person ethical perspective allow the player to negotiate the world's complex decisions from the character's point of view. In a highly social game like LARP, they are negotiating those ethical decisions and ethical spaces with others, often in agreement with some, in opposition to some, and needing to convince some. (p. 183)

The ability to practice these ethical dilemmas in a game state adds value to the activity. If the play was simply isolated to the game and never analyzed in any broader context, the academic value could be questioned. Where instructors have found the most success is in using games to engage students and then framing the experience in a relevant context. This is how some games can allow for ahistorical outcomes while still highlighting educational value. It is not that the students are playing out a mirrored simulation of historical events; they are engaged in the time, place, and variables in which those events occurred. That allows the instructor to relate the ahistorical activities as connections are made to what actually happened.

### **Zone of Proximal Development**

Game design and education battle the same process of skill growth and development. Previously, Mihaly Csikszentmihalyi was cited in reference to his Theory of Flow. In that theory the progression in skill is mapped through time. Player skills increase through time as one continues through struggle and progression. Lev Vygotsky (1978) coined the term "Zone of proximal development" in which he outlines how individuals grow (p. 86).



Source: Vygotsky, 1978

*Figure 8. Zone of proximal development*

If a player is viewed as the learner, the game designer can think of the flow of game play as an experience between the three zones. Ideally, players will start an experience in either the center or middle ring. As time progresses, if nothing new is added, players should gravitate toward the center ring as designed tasks become routine. It is at this point the designer should add new challenges. Education should mirror this experience. As students start a topic, they should be in the middle or center zone. As their comfort with the tasks increases, their experience will gravitate toward the center. It is then up to the educator to add additional challenges to the educational experience to keep the individual from becoming bored with the routine.

### **Implementation of Game-Based Learning**

Institutions have embraced game-based learning, from the Quest to Learn (Quest to Learn, 2009) public school in New York, to the development of the game-based learning course

management system, GradeCraft (GradeCraft, 2017). Education has adopted engagement as the primary focus for helping students realize the value of knowledge. Likewise, corporate environments have embraced game-based learning to help engage with their customers. Companies like Nissan (Nissan Leaf, 2014). and Volkswagen (Diaz, 2009) have gamified various elements of their consumer experience to engage them in new and emerging markets.

Quest to Learn has completely revamped the classroom. Rather than planning lessons, game designers are used to engage students in relevant content. As described on their website:

Game-based learning takes a variety of forms at Quest to Learn. For instance, in ninth grade Biology, students spend the year as workers in a fictional bio-tech company, and their job is to clone dinosaurs and create stable ecosystems for them. By inhabiting the role of biotech scientists, the students learn about genetics, biology and ecology. (Quest to Learn, 2009, n.p.)

This approach puts student engagement first and the content second. What good is content if the student only memorizes it to pass a test? The future is not made up of neat, organized, multiple-choice tests; it is made up of interconnected problems with complex answers. The future is game like, not just raw content.

University of Michigan explores this approach further with the development of the GradeCraft Learning Management System (LMS). This LMS is designed from a gamified approach to learning. Much like Lee Sheldon's *Multiplayer Classroom* (2016) text introduced ways to gamify the classroom, this innovation from the University of Michigan transposes that same gamified approach to an online learning environment:

GradeCraft supports gameful instruction, a new approach to course design that emphasizes the need for students to make meaningful choices about how they will make progress within a course, be enabled to take on work that constantly challenges them, and feel connected to both their peers and instructional staff. These courses are designed to encourage students to take risks and make self-aware choices regarding how they best learn. (GradeCraft, 2017, n.p.)

While this approach certainly has its roots in education, it is no surprise that corporate entities have embraced it. This allows the corporations to engage with their customers through an interactive experience.

In 2008, Ford designed the interface called “SmartGuage with EcoDrive” to give nontraditional feedback to the driver (Ford Motor Company, 2008). It was featured first on the Ford Fusion and Milan Hybrids. This was designed almost in parallel with the Ecological Drive Assist System dashboard on the Insight Hybrid from Honda, and the Nissan Leaf had its own version, too (Honda, 2008).



Source: Nissan Leaf, 2014

*Figure 9. Nissan Dashboard*

This interface gamifies the task of driving with using as little fossil fuels as possible. The more the driver relies on the battery, the better the feedback will be from the vehicle. In traditional vehicles, the only real feedback given to the driver is the fuel gauge. That information is not timely enough to be meaningful, as it would be similar to only giving a student a midterm or final in a class. The constant feedback provided by this dashboard lets the driver know immediately if he or she does well or poorly at conserving their fuel.

An initiative by Volkswagen researched this idea and published descriptive videos of their research online (Volkswagen, 2009). All of the cases were designed to provide a given behavior while researchers then changed the feedback given to participants to see if it elicited behavior change. In one example (Volkswagen, 2009), the researchers took a staircase and escalator that were next to each other. They measured the traffic for each path and found that the traffic patterns were heavily in favor of the automated escalator. Researchers then added a touch-sensitive piano function to the staircase. This made the stairs light up and play sound as people walked on them. They cite that “66% more people than normal chose the stairs over the escalator” and concluded that, “Fun can obviously change behavior for the better” (Volkswagen, 2009, n.p.).

A more traditional example of game-based learning comes from the company *GuardUp!* (GuardUp! n.d.b.). This organization offers a typical summer camp experience for young adults. The twist is that students learn skills while they play. Every advantage they earn in play is tied to an academic skill. GuardUp! offers the following philosophy on their website. “1. All actions must be safe. 2. All actions must be fun. 3. And all actions when #1 and #2 are met must be educational” (GuardUp! n.d.b., n.p.). This philosophy embodies the game-based learning mentality; just because their participants are engaged in play does not mean that they are not engaged in learning. In fact, GuardUp! designs the play so that those that learn it will be more successful at the game. This creates a self-reinforcing model of education as the nature of games and play imply a winner. The inherent motivation to win bleeds over into the intrinsic motivation to learn.

While the environment often emulates a traditional fantasy setting with elves, dwarves, and other mythological creatures, the goals are specifically designed to inspire learning.

GuardUp! offers two points on how players do this:

We accomplish this by:

1. Presenting our students with challenges which require them to investigate and ask questions while looking outside of the immediate environment for solutions and allies who can help them learn.
2. Incorporating the concept of “Transference” into our games, lessons, and adventures, which helps students consider what they are learning and how to apply it to their life outside of our company. (GuardUp!, n.d.-b).

The critical point here is in what this organization is intentionally trying to accomplish. Again, they state:

We inspire your children by providing the following:

1. Dynamic, interactive adventures filled with constant scenarios that require teamwork, investigation, and introspection about their values.
2. Characters and creatures from real world mythology, literature and history which inspire kids to learn more about the world in order to succeed at their quest.
3. Challenges with results that change depending on the student’s choices and open discussion about how the difference they make in the story can mirror the difference they make in the real world. (GuardUp! n.d.-b).

Not only is the play designed to teach, but it is with great purpose that this learning is made to transfer into real-world application. These students are not just learning how to be better at the game, but those same skills are being brought into the real world.

Modern educational games are developed with specific learning objectives in mind. Companies like Filament Games (Filament Games, n.d.-a) and Genius Games (Coveyou, n.d.), as well as public entities like MIT Media Lab and PBS Workshop, have emerged as leaders in using games to teach specific curricula. While each might specialize in a specific age or

discipline, there maintains an overarching theme that games can create a learning environment though a mix of content and play. For example, Filament Games describes what they do as, "... create digital experiences that expand a player's way of thinking. Our approach to game-based learning has the power to engage, inspire, motivate, and educate" (Filament Games, n.d., n.p.).

Likewise, Genius Games (Coveyou, n.d.) describes what they do as:

Genius Games is a STEM (Science Technology Engineering and Mathematics) based publishing company that strives to create high quality table-top games and children's books that are both entertaining and educational. Our hope is to create resources that are a blast to play and read, but simultaneously demystify intimidating concepts in the sciences and engage the players in a lifelong process of inquiry. (Para. 1)

The goals of these companies are similar. While the medium (digital versus analog) are different, the content varies (with Genius Games only focusing on STEM content), and the audience does not line up (grade school versus higher education), the same game-based learning pedagogy dominates through each approach.

The conversation of game-based learning almost always leads to how to assess learning in a gaming environment. Richard Halverson and Elizabeth Owen (2014) researched this challenge relying on the vast amounts of data produced in digital environments to quantify learning. While that is interesting, it does little to directly help analog (non-digital) games in the classroom. If an instructor was able to capture the play from analog sessions in the same way that digital games capture actions, there might be a parallel. Given the nature of increased technology integration in the classroom, it is not impossible to visualize a future where natural interaction will be captured in a similar way as current digital environments allow.

In games that are designed for learning, the assessment often mirrors a traditional assignment. In "A Rebel's Guide to Rescuing History" (Truitt & Simkins, 2018) students write, research, and present data. The only difference is the gamified environment. Students are not

assigned a paper because it is part of a learning objective, but because it is part of a scenario. The students partake in an experience where they play rogue agents trying to preserve history from a corrupt government bent on censoring history. This element of play provides motivation that traditional assignments might not. Games have the question of “Why am I doing this?” built into the play. Sometimes “winning” is the only answer needed to create motivation.

### **Industry Experts**

Game-based learning has recently dominated academic discussions. Some researchers have cited examples of this going back thousands of years, but it is only within the last 10 to 20 years that the conversation and research has truly emerged. Looking back 20 years, there is the emergence of the publications from Marc Prensky and James Gee. As time passed, Kurt Squire and Constance Steinkuhler adopted James Gee as a peer mentor and created a following at the University of Wisconsin - Madison. Some notable students of Squire and Steinkuhler include Sean Dikkers, Sean Duncan, and David Simkins. All have added to the game-based learning conversation in their own right. As TED talks became all the rage, Jane McGonigal took the stage and became one of the most popular videos hosted on the platform. Her book, *Reality is Broken*, (McGonigal, 2011) provided a mainstream look into the power of gaming. MIT Media lab gave Eric Klopfer and Scot Osterweil homes to do their research on game-based learning. Their research was the topic in a recent massively open online course (MOOC) in which participants had to create learning games (MITx 11.127x, 2015).

Mark Carnes developed the *Reacting to the Past* (Reacting to the Past, 2001) pedagogy in isolation. It is worth noting that *Reacting to the Past* is one of the few success stories where instructors who would not identify themselves as gamers feel comfortable using games in the classroom. This is something truly unique across most research. Lucas Gillespie and Peggy

Sheehy developed courses surrounding *World of Warcraft* (Blizzard Entertainment, 2004) and harnessed the engagement of the game to fuel student assignments, while Joel Levin did the same thing with *Minecraft*. He later formed *MinecraftEDU* that allowed the software to emerge in otherwise locked down K-12 networks. Lee Sheldon (2016) added to the conversation with his text, *The Multiplayer Classroom*. This text walks educators through the process of converting a traditional classroom into a game experience. Most recently, Matthew Faber expanded on this conversation with his text *Gamify Your Classroom* (2015).

As game-based learning has emerged as an arena of study various individuals have helped develop the conversation. As disciplines go, game-based learning is still a work in progress. It was not even 10 years ago that distinctions between game-based learning and gamification were introduced into the lexicon. Early examples can be traced far back into history, but the intentional design and implementation of games for education have really only hit mainstream education in the last 10 to 20 years. Even that resurgence could have been but another blip on the education pendulum of methodology if it were not for the emergence of serious play as a discipline. This purposeful look at using games for a reason has given a home to the thought process of how it all happens. The discipline has become a stake in the ground that allows educators to rally around. While educators have used games to informally teach for years, this change in perspective has allowed for the justification of game-based learning to enter the mainstream.

Early in the formal conversation, perspectives from recognized experts like James Gee, Constance Steinkuehler, Henry Jenkins and Kurt Squire are acknowledged. In 2005, when the first Games, Learning and Society (GLS) conference was held in Madison, Wisconsin, there was not a lot of academic press that focused on games. However, considering the speaker list from

2005, with the benefit of a historical perspective, the right people were in the right place to have the right conversations (Games, Learning and Society, 2005). This conference continued for 12 years and the final session was held in 2016. GLS announced its formal successor in the Connected Learning Summit that commenced Summer 2018.

GLS acted as a hub for the academic conversation surrounding game-based learning. Using the internet archive, it is easy to trace the speakers and conversations from GLS to various other institutions and publications. The only exception to this hub is Mark Carnes (Carnes, M., 2001). He created the *Reacting to the Past* (RTTP) series of educational games in, what seems, isolation. Often game-based learning will thrive with individuals that like to play games. It is rather unusual for non-gamers to embrace games in their classroom. The old adage holds true: people are most likely to teach how they liked to be taught. The RTTP community seems to be the exception to the rule. With a few exceptions, the majority of professors using RTTP do not play traditional board games. With personal interactions, presentations, and countless conversations within the community, few individuals would identify as gamers.

### **Game-Based Learning Texts**

*Gamify Your Classroom: A Field Guide to Game-Based Learning* (Farber, 2015) is only the latest publication in a trend to make the classroom more engaging. A recent highlight from the academic shelf is *Teach Like a Pirate* (Burgess, 2012) encourages engagement over content. It aligns almost perfectly with Lee Sheldon's *Multiplayer Classroom* (2016). All of these authors encourage teachers to engage the student. The days of content being the scarce resource have diminished so much that teachers only need to make sure the students are engaged, and the content will be backfilled by any number of technical devices. The idea that content delivery is no longer the primary task associated with an instructor fits into the idea of "flipped classrooms."

That is, the idea that classroom time should prioritize use for tasks that cannot be done outside of the classroom. If reading a chapter or watching a video can be done outside of the dedicated class time, then instructors can use class time for activities that could not be done in isolation. That shifts the duties of the instructor away from the conveyor of standard content.

Even traditional game design textbooks like *The Art of Game Design* (Schell, 2017) could be used in any teacher education curriculum. The difference between student engagement and player engagement are insignificant. Both designers compete for attention span. Each environment needs to teach highly complex content and find ways to give feedback and support to a user group. The main difference is how individuals approach this environment. A game is approached by choice and competes for every second of user interaction; an educational environment is traditionally mandated and mostly relies on laws and social stigma for a minimum level of required interaction.

Science fiction is an easy place to look for innovative possible futures. *Ender's Game* (Card, 1985) features an educational environment designed around game-based learning. Every interaction in the simulated combat environment is designed to make individuals stronger. The feedback is instantaneous, and the game is meaningful to those playing. The use of scoreboards or leaderboards are textbook examples of gamification.

## **Summary**

Game-based learning and gamification are two general categories of engagement techniques that are used with great success. While the formal introduction of these into the classroom with purposeful engagement is relatively recent, the practice can be traced back thousands of years. As educators shift from content sources to engagement experts, the classroom environment will also shift. Everything about a traditional classroom is designed to

maximize the efficiency of content delivery. The quiet environment, the rows facing the source of the information, and even the schedule are designed to make sure that the greatest number of people can experience that source of content as possible. As that source is devalued as the only primary source of the classroom environment and the roles of the individuals in the room shift. A “good student” used to be defined as one who could sit, listen, and then be able to recite on demand. That is no longer the desired outcome. Classrooms are now designed to inspire curiosity and encourage creativity. That requires a different method and skillset from those facilitating the environment.

## CHAPTER THREE: DESIGN METHODOLOGY

### Introduction

*EnRolled* is designed to for use in freshman seminar classes. While the traditional college freshman might not be able to discuss college experiences in detail, after playing *enRolled*, they recount the experience of play. After engaging in play, the students will have an experience on which they can reflect and comment. This removes the fear of entering into conversation for lack of knowledge. If all the students have just played a similar game, the conversation surrounding that experience is more approachable. A student would not need to fear their experience being unique because it was part of a designed or intentional environment. Inversely, if the conversation was limited to personal experience, individuals might fear that they were unique in their perception of possible challenges in higher education.

In an ideal classroom environment, this will give students a chance to explore and debate the various elements of college during gameplay. This will emulate the familiar Socratic method of instruction familiar to most traditionally trained educators. While it is difficult to have students talk about an experience they have not yet had, focusing the conversation around the gameplay gives the student body a common experience on which to offer opinions. By disconnecting the student from the character that he or she plays, a level of critique can exist that does not require direct self-reflection. The value is student engagement in the discussion, not that a student immediately sees themselves as the focus of conversation. Discourse about what challenges their character encountered is the desired output. Further longitudinal research is required to see if there is any transference of that conversation to personal experience.

## Iteration and Design Process

Games are designed through an iterative process and *enRolled* is no different. This game started as a classroom assignment in the Directed Studies Program at Ferris State University (Directed Studies Program, n.d.). DIST 100 is designed to help students who are on academic probation and wish to continue their studies at Ferris State University. It was common for students to passively listen to advice and offer little or no feedback on the ideas presented. In conversations with other faculty who taught this course, this is a common if not universal experience on campus. In searching for a way to engage the students, *enRolled* was created.

The students constructed “College: The Game” during class. During each class session, participants considered another variable or mechanic that helped define success in college and documented ways in which it could fail. Students argued and debated variables, looked up data to defend their position, and related personal stories to support their ideas. One particular incident where the instructor thought drug use should have major impact, students debated that alcohol use was more influential. They all knew someone who had drunk themselves out of school and argued that they could obtain a six-pack of whatever they wanted with one phone call. Drugs, while detrimental, were not as prevalent on campus. Thus, alcohol was assigned in the game to have the most negative influence points. The critical objective here is the discussion about the variable. It was lively, data-driven, and *personal*. That the conversation happened around the variables in the game did not matter; it was that the discussion happened at all that was worth further reflection.

This design exercise was limited to a single section of DIST 100 at Ferris State University during the Fall 2013 semester. The single data point is recognized as a limiting factor and not intended to provide evidence. However, it created motivation to proceed further with the game-based learning example. With the creation and distribution of *enRolled*, the possibility for

further research is greatly increased. *EnRolled* provides for a common platform for faculty to experiment with.

As the conversation about the course and student interaction expanded, there was interest by other faculty to try and reproduce the results. Because so much of the experience required game design expertise, it was decided that the game should be made to allow others to facilitate this conversation. The idea emerged that the game would be created and then variables could be debated and modified by the class. A typical outline of a course would be to play the game one day and debate the experience during the next session. The course experience would be a series of sessions discussing the similarities or differences between play and real life.

Imagine a student who had a character that did not study enough and failed several classes. The classroom discussion then becomes, “Does the game experience match a real-world possibility?” *EnRolled* was created to encourage that conversation. It was not designed with a traditional gaming experience in mind. The primary goal of the game experience is to leave students with the content to contribute to the conversation. After 50 minutes of playing *enRolled*, a student should be able to talk about their gaming experience and compare and contrast how elements of play either agrees with or disagrees with their personal experience.

Using the framework utilized in the Digital Animation & Game Design (DAGD) 150 course Introduction to Game Design textbook, *The Art of Game Design* (Schell, 2017), the development of *enRolled* continued. The structure of the course made it easier to follow the same path set out for students: rapid prototyping, playtesting, and iterating until the product resembles the experience desired. This process was aided with the massively open online course (MOOC) offered through MITx called 11.127x: *Design and Development of Games for Learning* (Design and Development of Games for Learning, 2016). Critical for success in the MITx course was

creation of prototypes, recording a play session, and then uploading the video for peer feedback. This process helped formalize much of the actual gameplay. It was the prototype that emerged from this MOOC that was presented at the Reacting to the Past: Game Development Conference, and the GenCon | Trade Day Conference.

When educators first encounter these games, there can be a lot of resistance if the audience has a negative perception of games in education. It was critical during this development process to find educators who saw the value in play and could provide constructive criticism of the game itself, and not the general idea of game-based learning. This unique blend was found at two different conferences. The first was the Reacting to the Past: Game Development Conference where individuals propose, play, and prototype role-playing games for higher education environments. All of the instructors in attendance had either used or are using games in their classroom. They see the value of this medium. More importantly, these educators already approach games with the angle of constructive improvement. The entire conference is designed around the playtesting experience. Sessions are designed to give feedback to the game designer. It was through this conference that the debate surrounding who the players play was settled. When *enRolled* was presented to this audience, it was still unclear if the students would be playing a fictional character or if they would be playing as themselves.

The ability for students to distance themselves from the actions and consequences of the characters is critical for encouraging conversation. The goal of playing *enRolled* was to allow the students to play a simplified version of college, not simulate their college experience. *EnRolled* encourages students to have a conversation about the experience their characters had, not to personalize the experience. In early playtests where students played themselves, conversations emerged where students sarcastically remarked, “I’d never do that,” in response to selecting a

random event card. The players disconnected from the experience as soon as it was not believable. Having players adopt a role for the duration of the game addresses this complication. While not as immersive as other roleplaying experiences, this design choice still allows for some of the same outcomes. David Simkins explores the nature of playing characters in his book, *The Arts of LARP* (2015).

The number of possible roles one could experience through role play is endless, and the role does not need to be representative of a ‘real world’ role. Participating in a role in game requires playing a character that has a defined role within the game’s setting, the world. (p. 44)

Thus, students can play a version of a student with the goal of successfully completing a degree without having to address the “I’d never do that” conversation.

The second audience that *enRolled* was presented to consisted of educators at GenCon 2016 | Trade Day (Gen Con LLC | Trade Day Information, n.d.). GenCon is one of the largest gaming conventions in the Midwest. Attendance for this four-day convention in Indianapolis generally exceeds 60,000 individuals. Trade Day is held the day before GenCon and features educators, librarians, and museum curators to discuss topics and trends in game-based learning. This group is comprised of individuals who already spend a vast amount of time playing tabletop games. Their base game knowledge helped smooth out some of the basic gameplay of *enRolled*. While presenting this iteration of *enRolled*, the play itself was discussed. The participants understood that it was based on *Lords of Waterdeep* (Wizards of the Coast, 2012) and *Dead of Winter* (Plaid Hat Games, 2014). From there, the discussion moved onto the actual flow of play. This session helped solidify the gaming experience into what has been created as the final product. That is not to say the game and play will not further evolve, but that this first public iteration and fully meets the base learning objectives desired.

The design of *enRolled* relies on a worker placement mechanic. This is commonly used in game design that gives players a way to tangibly consume time. Each player has a specific number of tokens to spend, usually in the shape of little people, commonly called Meeples. These Meeples are placed at specific locations on a board to represent time the player character spends completing a task. In *enRolled*, players must prioritize where they spend their time as there are limited slots at each location. If a player does not prioritize a specific activity, he or she may not be able to play there in future turns.

### **Learning Objectives**

While playing *enRolled*, students should encounter several conversation points. Currently, the most obvious is the mechanic regarding student debt. Before every turn starts, players pick up a debt token. This is a core part of the experience as a student has to “pay to play.” In the feedback from some of the play sessions, individuals wanted there to be scholarship options offered. While that does add to the conversation, it distracts from the core learning experience. The idea might be included in a future expansion of the game, but it has been left out for now. Debt is a major part of the final scoring metric. Students accumulate debt every turn and during several of the game events. This can be countered by placing a Meeple, one of the character pieces, on one of the two job areas on the board. The discussion that ensues should include if it is worth it to work part-time to eliminate debt.

The second conversation surrounding the game experience should be that the college experience is not always fair. Some students will be better at different subjects, particular experiences will randomly benefit a subset of the population, and other events will destroy a semester for the unlucky ones. The college experience is not fair, and *enRolled* was not designed to ensure that every player has the same chance of winning. College is similar as there are

different experiences for each student. Luck does play a role in education; students should be interested in talking about how lucky or unlucky they were in playing. It is worth asking the students if they think this is an accurate representation of their college experience.

Enrolling in classes will likely cause some conflict between students who have similar majors. If there are four students playing and they all have a degree that is heavy in math requirements, the experience will highlight a lack of available seats in the classroom. This is designed to emulate the limited capacity of course offerings at any college. It is not uncommon to be placed on a waitlist for a preferred course. Those students who prioritize enrollment in a given subject will have more options for different difficulties. As students pick up classes later in the enrollment phase, they will have fewer options. This leads to the possibility of direct competition among players. During some playtests, it has been witnessed that some players will enroll in courses just because they know another player needs a particular subject. While it is possible that the players would use these dice for electives, it did not appear to be the reason for their selections. This did not hurt the overall gameplay but slowed the graduation timeline of the other players.

Students will also experience either a personal trait that aligns with their degree or one that conflicts with it. The discussion of this experience is that some students are likely better at a given topic or subject matter. If they wait to select their degree until they find out what they like, players (students) will be better off.

If a player fails a course, he or she will acquire an additional debt token. Students should discuss this as it does not directly represent debt, but specifically the time and resources dedicated to being able to take the course.

Additional discussion expanded upon scholarships, transfer students, personal relationships, sports, professional jobs, and other possible student goals. *EnRolled*, as a gaming system, can allow for any or all of these variables. Further development of the game includes other variables that broaden the discussions that students have. This would increase the value of the game as a potential textbook replacement for traditional freshman seminar courses. Rather than covering a new chapter or topic each week, the instructor could use different event decks and discussion points.

### **Summary**

From its inception, *enRolled* was designed with a target audience and learning objectives in mind. Freshman seminar courses are created to instruct best practices to a student population who does not necessarily know what game they are playing. In personal feedback from students who have taken the Ferris State University Freshman Seminar course, it has generally been reviewed as a “waste of time” (Peters, 2015, Para. 2). Articles about this exact issue, can be found going back as far as 2011 (Anger, 2011). Instead of their traditional content delivery experience, it would be designed as an engaging discussion where students compare their gaming experience with what they have experienced on campus.

## CHAPTER FOUR: *ENROLLED* ASSETS

### Introduction

*EnRolled* is a modern style board game designed to be used in freshman seminar courses. The primary goal is to give students something to talk about. *EnRolled* is designed to make the students an active participant in a simplified college environment. This allows for a common external experience to be discussed in class. The typical classroom on campus does not have a student population that has a similar educational background, expectation, or experience that could be discussed. By creating a common experience for all the students, the platform for discussion points exists. The educational template of *enRolled* is overly simple, yet it allows for the core learning objectives to be debated. Simple life events might make the difference between passing and failing a course. Debt is always present, and the lure of using time to eliminate debt is an option. Academic competition is possible if seats in a popular major remain limited.

If students can talk about their game experience, it is theorized that the content will have some level of transference. The vast majority of choice in *enRolled* is based on students considering priorities in their academic career. If students can recognize that degrees, courses, and study habits are all conscious decisions, then the game-based learning experience can be deemed a success.

The following text is the rulebook for the game that is the subject of this project dissertation (enRolled, 2018).

## **Rulebook**

### ***enRolled Summary***

Welcome to *enRolled*, where players get to challenge themselves at succeeding in college. Imagine you are a freshman in college. What will you do first? Should you go meet with your advisor, enroll in your favorite classes, or get a part time job? You decide and your character will succeed or fail based on your choices and random events. *EnRolled* is designed for groups of 3 - 4 players, and gameplay should last 30 - 50 minutes.

### ***Components:***

1 Campus board

5 sets of Class cards (English, Math, Science, History, and Elective)

1 set of Event cards

6 Character cards

1 set of Player Attribute Cards (15 cards)

4 sets of color-coded dice (Red, Blue, Green, and Brown: 1D10, 1D8, 3D6)

4 sets of color-coded Meeples (one set per player)

2 Job dice (D4) black

1 Cram die (D10) black

1 set of Degree cards (15 cards)

First Player Token

50 Debt tokens

### ***Locations:***

The Mound of Debt

The Library

Courses (English, Math, Science, History, and Electives)

Studying (English, Math, Science, and History)

First Player Location

The Advisor's Office

## **Summary of Play**

### ***Setup***

Each player selects a Character Card. Shuffle each of the five sets of the Class Cards and the Event cards, placing them on their matching locations on the Campus Board. Shuffle the set of Player Attributes and allow each player to select one at random (keeping it face-down on their Character card). Give each player a set of five matching Meeples (the small, people-shaped objects). Roll a six-sided die (D6) to determine what player will start with the First Player token. The player with the highest roll will go first and play continues clockwise from the first player.

### ***Phases (Overview)***

Play is separated into two different phases. Combined, the two phases represent a single semester. The first phase (Enrollment) is where players have opportunities to meet with advisors and select classes. The second phase (Finals) is where players collect dice and then roll to see if they were able to pass their classes. After the second phase, the board is cleared to allow additional semesters of play.

### ***Play***

At the start of every semester, every player must pick up a single Debt Token. After this has occurred, starting with the first player, players use their Meeples to select tasks he or she wishes to complete. If a player wanted to meet with their advisor, that person would put their

first Meeple in the Advisor's Office location. (Note: There are limited spots at each location, so be sure to prioritize your activities). As soon as the Meeple is placed, complete the action associated with the location. In the example of placing the Meeple at the Advisor's Office, the player would draw three Degree cards and have the option of selecting a single major. (Players can choose to keep this information private or inform other players). A major does not have to be selected if the player does not like any of the options provided by the Advisor's Office. Both the Advisor's Office and the First Player Location may be visited during either the first or second phase.

A second possibility would be to enroll in a course. To do this, the player places their Meeple in the course location. If that player is the first one there, he or she draws three Course Cards and select the course they like, discarding the rest. If that person is the second player, he or she must draw two cards, select one, and discard the rest. If a person is the third, (forth, or fifth players), he or she must simply draw a single Course Card and do their best to complete it.

Benefits are given to players that arrive first to a location. This can be represented by either a higher value die, in cases of studying, or more options to select a class, in cases of enrollment.

After players have placed all of the Meeples they want (and the appropriate actions taken at each location), the Enrollment phase is complete, and players pick up their Meeples to start the second phase. Players do not have to place all their Meeples. There is no mandate that all Meeples must be played, nor any penalty for not playing them.

The second phase represents the time spent during the semester. Here, players (starting with the first player) can prioritize their actions. To start this phase, each player will draw an Event Card that will likely influence the semester. There are both positive and negative

possibilities. After the Event Cards are drawn, players will place their Meeples at various locations on the board. These spaces represent time spent on various activities. Some options include specific class studying, working, general library studying, or meeting with your advisor. For specific disciplines, the study die must match the course for which it is being rolled. Dice from any discipline(s) can be used to complete Elective Courses.

During the second phase, players will likely spend the majority of their time placing their Meeples at study locations that match their course load. If a player has a hard math course, that person would likely want to make that a priority and try and get the largest possible die for the math discipline. Likewise, if the player has a simple history course, he or she might not need to prioritize studying for that course.

After all the Meeples have been played and the dice at each location collected, use those dice to try and meet or exceed the difficulty score of each course that was *enRolled* in. If a player has *enRolled* in multiple courses for a single discipline, that player must divide any study dice for that discipline before the dice are rolled. For example, if a player *enRolled* in three math classes, with difficulties of 7, 5, and 2, the player would have to dedicate dice to each class before rolling any. Say for example the player had all five math dice and rolled a 1, 3, 5, 7, and 8. If he or she chooses to have only the one die that rolled a 1 on the course with a difficulty of 2, this results in failing that course. This player cannot use one of the other dies to cover the shortage.

Courses that are passed are added to the character's course pile, and courses that are failed are discarded. If at any time there are not enough courses in the pile, shuffle the discard pile and return it to the stack. Collect an additional Debt Token for each failed course.

After the second phase, Meeples are collected and the play starts at the Enrollment phase again. After the first player completes their degree, the remaining players will have two additional semesters to try to complete their degrees. After that additional semester, scoring will begin.

### ***Scoring***

- The first player to complete their degree earns 10 points. (If multiple people graduate during the same semester, they all receive 10 points.)
- Additional players to complete degree earn 8 points.
- Debt: The player subtracts 1 point for each debt token.

### **Lesson Plan Example for Using *enRolled***

In an ideal schedule, faculty can dedicate at least three 50-minute class periods for learning *enRolled*, playing the game, and then discussing or debriefing about the experience. The first time that students are exposed to *enRolled*, it is unlikely they will complete the game during the allotted 50-minute class period. If schedules are condensed, it may be possible for students to watch a tutorial play-through video to learn the game mechanics before class meets. It may also be possible to play this tutorial video during the first part of class and have enough time for the students to play if the boards are already set up.

The “learn to play” time is the most flexible as it is purely functional. If students are excited to play, it is possible that this can lend to additional playtime. It is critical that the time dedicated to the discussion about the experience is left intact. This game is not a replacement for education; however, it allows the students to have something to talk about. The primary point of this experience is to allow the students to disconnect from the act of education to be able to talk about their play experience. The conversation is no longer personal. This shifts the discussion

from “Why am I failing courses?” to “Why did my character fail courses?” This allows for a deeper conversation in which everyone can participate. Students should not judge each other for their character’s inability to complete a degree in the same way that they might judge or be self-conscious of their personal academic experiences.

As a class, students can discuss why some of their cohorts succeeded and why others failed, as it no longer takes into consideration personal experiences. Games might be very close; a student might only fail a course because of a random Event Card. Talking about how realistic it is that a personal event causes someone to fail a course is an ideal outcome of this gaming experience. Doing this within the context of the game allows for a personal conversation without being too personal.

An example of an assignment after the first play-through might be for students to create their own Event Cards. The existing *enRolled* Events Deck can easily be replaced with a pile of index cards with student created content. It would be an interesting class exercise to create events, talk about the modifications those events may have on the gameplay, and analyze any themes or trends the students bring up. Asking questions like, “How many of the events are social, financial, or academic in nature?” could lead to an interesting discussion about who, how, and why students fail out of college.

## **Summary**

*EnRolled* has been designed from conception to production as a tool for educators to use in an environment where students could benefit from a conversation about driving issues regarding college life. While the game itself does not include this conversation, the play will provide an opportunity for discussion afterward. It is expected that the instructor will guide this conversation, allowing students to debate game variables and debate possible outcomes of

various encounters. The experience of play alone does not teach anything; it is the meaningful conversation debriefing the play that allows for a deeper look at the content. This is where meaningful learning is most likely to occur.

## CHAPTER FIVE: DISCUSSION AND RECOMMENDATIONS

### Introduction

When this project dissertation commenced, the initial goals were to create a low-cost board game that could be purchased and deployed in any classroom with three students and a flat surface. The game would be designed to give students an experience that highlighted some of the challenges they would encounter in higher education. Initially, there were many complex subsets of the game that included social, economic, and personal goals. While these elements added to the depth of play, it also took the game outside of the simplicity and time limitations defined in early development. Initial feedback stated that if a game could not play in under 50 minutes, it would never see a classroom. Teachers would talk often about wanting games to play in 30 to 35 minutes so they could have setup and cleanup time around a 50-minute class. With that limitation in mind, *enRolled* was designed to play in 30 to 50 minutes and many of the additional game mechanics were removed. Ideas for game expansions that focus on transfer students, socially motivated students, honors students, scholarships, and athletics have been intentionally left behind. This allows the core learning objectives to be discussed, although it is at the cost of the breadth of the conversation.

### Future Research

*EnRolled* is designed to create an engaging educational experience for students who are in a curriculum focused on teaching how to become a better student. The best measures of success for implementation of *enRolled* in the curriculum would include in-class success,

retention rates, and eventually graduation rates over a multiple year, multiple cohort, and multiple institution study. This could be localized to a single student population in one course with a single instructor, but there are many variables to try and control for. As the research expands, so does the complexity and time required.

In a smaller qualitative study, it would be possible to interview students about their experience. Interviewing student populations who successfully completed the current traditional freshman seminar course and future students who successfully completed the *enRolled* curriculum could allow for some measure of the influence of the content and delivery method.

Perhaps the quickest research methodology would be to conduct a Small Group Instructional Diagnosis (SGID) with the students. According to the University of Washington Teaching and Learning Center (n.d.),

Small Group Instructional Diagnostic (SGID) is a formative assessment technique used to obtain anonymous, mid-quarter feedback from your students about your class. A trained facilitator assists you in creating questions that you would like to ask your students. The facilitator then visits your class for thirty minutes while you leave the room and collects anonymous answers to your questions. The facilitator compiles the feedback into a confidential report for you and schedules a follow-up meeting to discuss the report. This provides you with an opportunity to go back to your students to reinforce your class learning goals while addressing student concerns. Hear what your students think of your course before the last day of class! (Para. 1)

The SGID would allow a faculty member to see if *enRolled* had any positive influence on the students at the midpoint of the semester. This data collection technique is anonymous and allows students to provide honest feedback without any fear of retaliation.

## **Limitations**

The two largest limitations on future research are time and money. Distribution, training, and initial cost for the assets required to play *enRolled* are nominal. Current copies of *enRolled*

can be purchased in single units from The Game Crafter: <https://www.thegamecrafter.com/> for about \$100. If any type of bulk production is possible, this per unit cost should lower to \$40-\$60 per game. As with most research, the more meaningful the data, the harder it is to quantify. The true impact of any particular lesson, approach, or methodology is harder to measure as time passes. While this project dissertation aims for the influence on student success, retention, and graduation, it is likely that three to four years will pass between the student's encounter with this game and the meaningful data point of graduation. Shorter term benchmarks like spring to fall retention rates and exit surveys might capture a glimpse of the impact, but it is unlikely to reveal the entire picture.

## **Conclusion**

*EnRolled* represents a purposeful design of game-based learning for a freshman seminar course. It is with the understanding that students cannot engage in conversation about what they do not know that the experience was designed. Placing students in an environment where they are supposed to actively learn about college life without having experienced it yet creates an atmosphere where they have to sit and listen to a lecture. By creating a common game that all students can engage in, there is an emergence of conversation related to the game experience. This gives these students an active voice in what they just played. Students can compare and contrast the gameplay with their limited experiences or expectations. This shifts the tone of the class from the simple passive reception of content to an active debate of game experiences.

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