University of Central Florida
STARS

Electronic Theses and Dissertations

2017

School Has a Bad Storyline: Gamification in Educational Environments

Irene L. Pynn
University of Central Florida

 Part of the Game Design Commons, and the Instructional Media Design Commons
Find similar works at: https://stars.library.ucf.edu/etd
University of Central Florida Libraries http://library.ucf.edu

This Doctoral Dissertation (Open Access) is brought to you for free and open access by STARS. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of STARS. For more information, please contact STARS@ucf.edu.

STARS Citation
Pynn, Irene L., "School Has a Bad Storyline: Gamification in Educational Environments" (2017). *Electronic Theses and Dissertations*. 5652.
https://stars.library.ucf.edu/etd/5652

SCHOOL HAS A BAD STORYLINE: GAMIFICATION IN EDUCATIONAL ENVIRONMENTS

by

IRENE L. PYNN
B.A. Florida State University, 2000
M.F.A. Seton Hill University, 2010

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Texts & Technology
in the Department of Arts and Humanities
in the College of Arts and Humanities
at the University of Central Florida
Orlando, Florida

Fall Term
2017

Major Professor: Martha Brenckle

© 2017 Irene L. Pynn

ABSTRACT

School often has low engagement and frustrating or absent options for the kind of agency the Federal Government's 2016 National Education Technology Plan now recommends educators include in their curriculum. Video games offer opportunities for people to participate in critical problem solving through creative projects. From balancing character statistics, to collaborating with other players, to making ethical and tactical decisions that can change the outcome of the story, successful games draw on the player's interest in learning and analyzing numbers, locations, visual clues, narrative elements, people, and more. One useful example may be found in visual novels (VNs), a medium that pulls from narrative structures found in *Choose Your Own Adventure Novels*. These interactive narratives are a largely untapped resource (for educational uses) of guided critical thinking. My ongoing research explores the efficacy of implementing VNs into digital pedagogies to encourage the development of "creatigational skills." This term is a response to the problematic wording already in use for skills such as creative thinking and collaborative abilities, skills encouraged by and developed through interactive activities, such as gaming and many of the arts. Current terminology labels them "soft" or "non-cognitive" skills, which are clear misnomers that passively diminish the importance of creative thought. This research explores how gaming, specifically so-called "narrative" gaming, of which VNs are one example, might contribute to the development of creatigational skills in students. Through the creation of VNs for this study, I examine both the ability of this genre to engage and encourage imaginative thought, as well as the practicality of designing and developing VNs for classroom use.

To my family, of course.

I could write volumes about my love and gratitude. It would never be enough.

Particularly to Michaela O'Brien, who cheered me on when she was here –

and continued even after she had gone.

ACKNOWLEDGMENTS

A work like this cannot be accomplished alone. I would like to thank my committee, all of whom lent their expertise, creativity, and academic support as I planned, researched, and wrote this work. Particularly, I am indebted to my committee chair, Dr. Martha Brenckle, who talked me through countless intellectual tangles with unwavering positivity and patience over what felt like an unbelievably long period of time. This dissertation would likely not have reached completion without her encouragement. In addition, I must acknowledge three Florida Virtual School coworkers who offered their invaluable suggestions and brainstormed with me well past 5 p.m. on a Friday and over the weekend: Innovation Architects Joe Greaser, Mike Jarrell, and Michelle Lux. Finally, I owe unending thanks for the regular feedback and support from Kathleen O'Brien, Manning Pynn, Michael Pynn, and Robert Cunha, all creative professionals with backgrounds spanning writing, journalism, education, game design, and film/photography. It was these incredible people who helped me finesse my language, design, and logic over and over, even occasionally late into the night, when they faced daunting deadlines of their own.

TABLE OF CONTENTS

LIST OF FIGURES viii

LIST OF TABLES ix

LIST OF ABBREVIATIONS x

CHAPTER ONE: INTRODUCTION 1

Non-Cognitive, Soft Skills 8

Creatigation 9

CHAPTER TWO: LITERATURE REVIEW 25

Text-Driven Literature 25

Story-Driven Games 30

CHAPTER THREE: NARRATIVE CHOICE 33

Decision Paralysis 37

Game Design 43

CHAPTER FOUR: NARRATIVE THEORY AND VNS 49

What is Narrative? 49

What is Engagement? 54

The Impact of Choice 63

CHAPTER FIVE: *HAMLET*, THE VN 75

CHAPTER SIX: DRIVER'S EDUCATION VN 81

CHAPTER SEVEN: VISUAL NOVELS AND STEAM RESEARCH 85

APPENDIX A: *HAMLET* VN 95

APPENDIX B: DRIVER'S EDUCATION VN 97

LIST OF REFERENCES 111

LIST OF FIGURES

Figure 1. Screenshot From *Analogue: a Hate Story.* Screenshot permission: Christine Love 72

Figure 2. Screenshot From *Analogue: a Hate Story.* Screenshot permission: Christine Love 73

Figure 3. Screenshot From *Analogue: a Hate Story.* Screenshot permission: Christine Love 73

Figure 4. Screenshot From my visual novel version of Hamlet depicting the branching story options 76

Figure 5. Screenshot From my visual novel version of Hamlet depicting the multiple endings 78

Figure 6. Screen shot from my visual novel version of Hamlet depicting an alternative scene students can choose. 79

Figure 7. Visual Novel Script Flow Chart 84

LIST OF TABLES

Table 1. Visual Novel Rubric..... 89

LIST OF ABBREVIATIONS

ARG……..Alternate Reality Game

NCTE……National Council of Teachers of English

VN……Visual Novel

CHAPTER ONE: INTRODUCTION

"We know where we're headed – we want to solve the mystery – but we're not sure how we'll get there" (Heath 82).

When I turned sixteen, I went through the common teenage ritual of becoming an adult: I learned to drive. At first, I followed other people – friends or family members – to whatever location I wanted to visit. This learning method mirrored much of my educational experience thus far, which consisted of me sitting in a classroom, listening with various degrees of passivity to lectures in which experts guided me through the basics of what I needed to know. In school, the goal was to use what I learned in these lectures to answer questions on an exam or complete a project. Sometimes I was successful. Other times I was not. As a young student, I didn't concern myself with why my success rate seemed so inconsistent. I suspected I might have been paying better attention in some lectures, for whatever reason. Or perhaps I was naturally "good" at certain subjects, while others just weren't in my DNA. I unquestioningly accepted that school used a time-honored structure that couldn't fail me. The lecture–assessment system merely judged my abilities, and I sometimes passed or failed.

Following others as I learned to drive was part of a similar system. This method taught me the basics of using a car, helped me develop independent driving skills, and acquainted me with the roads in my hometown. All I had to do was watch, learn, and

repeat. And yet, I noticed I wasn't fully comfortable navigating the streets of my city by vehicle, even after several weeks of this instruction. I worried about getting lost. In this context, the world was significantly more real than it had been in the classroom, and mistakes came with significant consequences. Adults warned against causing accidents, breaking down unprepared, or turning down unfamiliar roads.

My friend, several weeks older than I, had learned to drive earlier, though without as much instruction, and already she demonstrated the kind of navigational confidence that I was eager to develop. She invited me to come with her to visit her boyfriend one afternoon, and I, ready to practice driving on a new side of town, eagerly accepted. This time, though, my driving lesson included an added challenge: she and I had to take separate cars so I could leave early for another engagement. Her boyfriend lived in an area known for its high crime rate, on a non-descript block, in a non-descript neighborhood, at the back of several winding roads off the main highway. His house was nestled in a part of the city I hadn't frequented, so, as usual, I let my friend lead the way. It wasn't until I tried to leave that I realized I was lost. (This was before cell phones, so I had no GPS).

Of course, I considered returning to her boyfriend's house to ask for directions, but by then I had already found myself in the middle of a sparsely populated, series of winding, rural roads, and I couldn't figure out the way back to his house, let alone to the familiar highway that would return me to the perceived safety of things I knew. Though this event took place in broad daylight in a wide, open space of land, it was a distressing experience – one where I felt oddly claustrophobic in the open area, as if I were locked in a cage with invisible walls. My skin ran cold as I noticed the gas light turn on and

realized I had no gas can in the car. I was lost with no one nearby to help, and I was about to break down.

This is what most people would refer to as a #firstworldproblem, but at the time, I was still young and learning. To me, it was a frightening problem, and I had to find the solution.

It amazed me that I had driven those exact streets just a few hours earlier. And yet, in that moment, they looked utterly unfamiliar. How was that possible?

Similar experiences have happened to me throughout my life. If I follow a friend, or if I do what my GPS tells me, I find I'm significantly less likely to internalize driving directions than if I make a conscious effort to understand where I'm going. It's as if I switch on a mental cruise control while someone else handles the wayfinding.

I'm not alone in this, either. Many other people experience the same thing. They can arrive at the hotel or party or conference location, but they can't tell someone else how to get to the same place. At a theatre cast party in 2016, several friends and I met at a restaurant to celebrate the end of the show's run. One of the actresses called from her cell phone to ask for directions. The actor she spoke to – who had just driven to the establishment, himself – stumbled over street names, lefts, rights, and distances, until he finally offered his best advice: "Plug it into your GPS. That'll get you here." I smiled as I heard him say this, recalling that long ago day in the car when I'd found myself lost in the middle of nowhere with a gas tank slowly fading.

Back then, I realized with despair that I'd failed to pay close attention on our way to my friend's boyfriend's house, just as I had failed to internalize the algebra lecture in

school that week. I excelled in other classes. Maybe my recent failures meant that math and driving were going to be weak areas in my life.

Whether this was an accurate evaluation of my abilities or not, the most pressing problem at that time was still to find my way home. The way I saw it, there were three options, much as there might have been in a game version of this situation:

A. Pull over and put my hazard lights on.

B. Drive to the nearest house and ring the doorbell.

C. Pick a road and go straight.

All of these came with pros and cons, and I analyzed each situation individually, imagining what might happen if I selected A, B, or C.

A. Pull over and put my hazard lights on.

This option felt safe. It didn't come with much risk, as my car would be stopped, so the gas wouldn't run out. I could lock my doors and simply wait for a police officer to drive by. With any luck, the officer would pull over to help. I might even get to follow him or her to more familiar surroundings.

An obvious problem with this plan was that I couldn't count on a police officer to show up on that quiet road for hours – or at all. There was a real possibility I'd be sitting there well into the evening before anyone arrived.

B. Drive to the nearest house and ring the doorbell.

This option terrified me. The more I thought about it, the less I liked it. Though I perhaps didn't fully understand every possible outcome of a sixteen-year-old girl presenting herself at a stranger's doorway and announcing, "I'm lost, and no one knows where I am," I knew I should proceed down this path with extreme caution.

However, I also reasoned that this might be the swiftest way to get directions. There weren't many houses in the area, but there were some. I could select the house that felt safest from a glance and ask how to reach the main highway, or maybe I could ask to use the phone.

C. Pick a road and go straight.

I couldn't decide whether this idea was brilliant or stupid. On one hand, if I kept going down one road, I might run parallel to the major highway and go deeper into rural, county roads until I ran out of gas and was forced to go with Option A.

On the other hand, I told myself I couldn't have gone too far from my home or my friend at this point. Surely if I just kept going down this road and didn't risk going in circles by turning, I would eventually hit something familiar – or at least a gas station with a phone.

I chose Option C.

In my panic that day, it turns out I had pulled from a lesson I'd learned in school. Our English teacher, faced with the daunting task of navigating an entire class through *Romeo and Juliet*, asked, "At what point could Romeo have made a different decision?" That question sparked conversation, and it was one of the few that prompted me to pay attention rather than pass notes. It stuck with me.

What *could* Romeo have done differently? The way I saw it, there were several wiser decisions he could have made that might have changed his fate:

A. Go with Juliet to announce their relationship to their parents.

B. Stay away from Mercutio during the fight with Tybalt.

C. Don't kill Tybalt.

When my classmates and I analyzed a variety of outcomes, we found ourselves building the world of Romeo and Juliet's Verona much more clearly in our minds. We came to understand the characters, their motivations, and the meaning of their actions in a way we never could when someone else – however qualified the person may have been – explained the plot. In fact, though the play was compelling on stage and film, this creative thought exercise took us through our own understanding of the story, and we built the narrative structure from the ground up.

School was fun that day, and, without realizing it, I had picked up a skill that would help me in an area of my life that had nothing to do with British literature.

I used the same creative thought exercise from *Romeo and Juliet* to get myself home the day I found myself lost. The process of thinking through my situation as a story, imagining different outcomes and analyzing their meanings, much as I'd done in English class, actually elevated my skills as a driver. It seems odd to credit my confidence as a driver with a creative thought exercise, and yet confidence is exactly what it brought me. Rather than simply learning how to press the gas, brake smoothly, turn the wheel, and use my blinker, I also learned how to analyze and weigh out the consequences of my decisions on the road.

In addition, I later found that I understood how to navigate those particular streets better than ever before. Obviously, I eventually got home. It took a little longer than it should have, but the overall benefit far outweighed the effects of the stress. I had learned an important lesson in critical thinking, for when I analyzed the roads I was on, imagined scenarios that might help or hurt my progress, and tested the directions on my own, I not only found my way home, but I *never* felt confused driving in that part of town again.

By the end of that upsetting day, I was happier and more confident than ever. Not only that, but I retained a lasting empathy for any other driver who asked me for directions. It was as if I had unlocked an entirely new map in my brain, and I had leveled up – just a little – as both a driver and a person.

All of this occurred many years ago, and the story is, doubtless, embellished and conflated with other moments in my memory. The purpose here is to demonstrate a point through narrative structure. Not only was the goal to tell a story, but to use a structure that presented choices and multiple endings.

It turns out narrative – like the stories I imagined alone in my car, or the ones my classmates and I designed to save Romeo – has a significant impact on the way we experience our world and the other people in it. In fact, stories are an essential part of the development of so-called "non-cognitive" skills, according to a variety of studies. In "Your Brain on Fiction," published in *The New York Times*, Annie Murphy Paul writes, "Dr. Oatley and Dr. Mar, in collaboration with several other scientists, reported in two studies, published in 2006 and 2009, that individuals who frequently read fiction seem to be better able to understand other people, empathize with them and see the world from their perspective" (Paul). Frequent readers will say this is no new insight. The benefits of regular reading have many times been demonstrated to go beyond vocabulary building, and the world has lamented a decline in reading since the rise of radio. Neil Postman's 1985 book *Amusing Ourselves to Death* warns that "a mode of thinking is being lost" when we turn away from sustained thought and allow others to do the thinking for us. In essence, when we ignore creative thinking, we smother our "non-cognitive" skills under easier media that we experience instead as passive observers. Of these media, we now

have seemingly countless options, some entertaining, some meant for work, and some intended for education.

Television. Internet. Games.

School lectures.

Non-Cognitive, Soft Skills

It is important to explain at this point that many creative thinking skills, such as empathy and the ability to analyze multiple potential outcomes, are often labeled "non-cognitive" skills, suggesting they are not abilities one can learn in textbooks or even in classrooms, but that they are skills gained and stored outside of normal cognition. Perhaps they are assumed to be skills that people are simply born with or without.

This label, of course, is a misnomer, as all thought requires cognition. Other times, these "non-cognitive" skills are also called "soft" skills, another problematic term that incorrectly implies they are less foundational, or perhaps even easier than "hard" skills, such as mathematics and reading.

Though the terminology is less than ideal, educators and business owners often find there is a need to distinguish these skills in writing and conversation from "cognitive" or "hard" skills. From countless business magazines touting headlines like "19 soft skills every leader needs to be successful" (Noel), to educational organizations announcing "'Soft Skills' Pushed as Part of College Readiness" (Adams), people have recognized a need to explore and address these skills separately from general education courses, when they should, in truth, be part of all courses.

Clearly, these terms pose challenges at the outset. The wording that describes skills such as creative thinking and collaborative abilities as "soft" or "non-cognitive" flies against contemporary understanding of cognition. They have the connotative effect of labeling certain essential competencies – often artistic in nature – with the exact stigma the terms are meant to counter: that these skills are, indeed, essential to intellectual and professional development.

Perhaps it is useful at this point to provide a more accurate term, one that, though it might not be as appealing to headline writers, will be more nuanced and precise for people attempting to closely analyze this topic. These skills require creative thought and engagement in topics in order to make important observations and successful decisions. They may be called "creatively engaged competencies," or, because I connect them with the skills that got me home the day I was lost, "creatigational skills."

Creatigation

Education is not just a matter of getting students through school and on with their lives. These students must be prepared for professional life, and many managers – including those whose careers don't have a clear creative focus – will rely on employees who can use creatigational skills to evaluate and address complex issues.

This topic is of particular interest to me, as I have spent the past several years working in online education and writing and designing curriculum for remote students, both in middle and high school and at the university level.

Creatigation, a portmanteau of "creative" and "navigation," is about much more than a sixteen-year-old's ability to find her way home in broad daylight. It's the skill required to retain larger lessons in school, navigate interpersonal relationships at work, and even anticipate – and prevent – danger.

As with all examples in language, these words, "creative" and "navigation," come with a variety of meanings and associations, which necessitates a more nuanced explanation of their use here – and why a completely made-up term, "creatigation," is more accurate than "soft" or "non-cognitive."

"Creative" or "creativity" can refer to many different things. These words are most often associated with the arts, and, in business environments, artists of all kinds often receive the title "creatives." This title applies whether the artists are actually creating something new, or they are re-imagining something from the past. Interestingly, the title also applies whether the artist's product receives a positive critical review or has any clear monetary value. In other words, all creative acts have, at the very least, creative value, the ability to inspire others, whether those acts are "successful" or not, as they may instigate conversation, debate, and thought – all essential components of creatigation. These components are also understood to have the potential to enrich, expand, enlighten, or mature the artist and his or her audience, simply by the act of doing them. This may be why critical reception and monetary reward, while valuable, aren't true measurements of the "worth" of the arts.

In the case of creatigational skills, I look at the use of hypothetical story creation to imagine alternate scenarios as a way to troubleshoot both the present and the future.

Specifically for this study, I focus on a form of gamified storytelling known as the visual novel (VN).

The suffix "ation" denotes an action, as in "creation," and creatigational skills are absolutely about creative action, though the action is not a physical one – at least, not at first. Creatigational skills call upon creative action that follows intellectual paths toward a destination or goal. Indeed, creatigation is a form of navigation – a sort of intellectual wayfinding.

In his MIT thesis, *Designing Navigable Information Spaces*, Mark A. Foltz listed specific design principles for wayfinding. Several of his principles illustrate, perhaps without intending to, the importance of navigation as a creative endeavor in developing skills that are necessary for success in life. All of the following concepts are addressed in more detail throughout this text as they relate to the research:

"Create regions of differing visual character" (Foltz). It is the visual element here that is most important to consider, as my research focuses on a specifically visual form of gamification known as the visual novel (VN). However, it should be noted that VNs are not the only way to achieve this goal. Many educators have used visual – and audio – aids with great success in other formats.

"Don't give the user too many choices in navigation" (Foltz). Though my research has found that choice is a major influencing factor in educational engagement and the development of creatigational skills, the roadblock of decision paralysis must be considered. In fact, it is also this element that makes VNs so appealing for this study, as the number of choices is, by design, limited.

"Use survey views (give navigators a vista or map)" (Foltz). This demonstrates the need for transparency in order for the students to accept their educational journey and willingly imagine scenarios in any informed way. Again, many VNs with larger budgets handle this expertly, providing literal maps of branching storylines in the form of flow charts that indicate where players may be going.

Careful narrative structure can be used to guide audiences through a story, and this is where VNs may be particularly helpful at developing creatigational skills. The importance of a good storyline extends well beyond school. In fact, storytelling as a serious consideration is a major consideration of business owners. In "The Entrepreneurial Skillset of Storytelling," Heidi Neck writes, "Nothing encourages creativity and connection like storytelling. As entrepreneurs, we try every day to introduce new stories to the world. The key, therefore, is making sure we tell them in a way that our audience will understand, appreciate, connect with, and act upon" (Neck). Why, when creativity and storytelling are so critical to getting consumers' attention, do we ignore these elements when we are trying to get our students' attention?

Creativity is not only a matter of engagement, either. As the 9/11 Commission Report indicated, creative thinking might have been the missing key to preventing attacks: "Terrorism was not the overriding national security concern for the U.S. government… The policy challenges were linked to this *failure of imagination*. Officials in both the Clinton and Bush administrations regarded a full U.S. invasion of Afghanistan as practically inconceivable before 9/11" (National Commission). While the administrations had all necessary warning signs at their disposal, no one put those together to imagine the attack and take steps to prevent it. The fact that imagination is

clearly identified as a factor in the tragedies of 9/11 and the international conflicts that followed indicates a necessity for creatigation and real-life storyline engagement, perhaps especially in careers that do not exist purely to entertain.

The 2016 National Education Technology Plan also addresses the importance of what we will continue to call creatigational skills in this discussion, indicating that they "include a range of skills, habits, and attitudes that facilitate functioning well in school, work, and life" ("Future Ready Learning"). These skills, however, have proven difficult to teach and assess.

Jesper Juul, in *Half-Real: Video Games Between Real Rules and Fictional Worlds*, describes the experience readers, audience members, and gamers have when their curiosities are piqued by what he calls incomplete fictional worlds:

> In fictional worlds, there is an important distinction between the description of a fictional world and the fictional world as it is actually imagined. The text of *Hamlet* directly describes a rather small world, mostly a castle in Elsinore with some hints of foreign countries. At the same time, the fictional world of *Hamlet* is presumed to be as large and detailed as the actual world. … Thus, the reader performs much work in order to imagine a fictional world, and consequently different readers and game players will imagine a fictional world differently. (122)

This filling in of details is an exercise in creatigation, and it's the kind of curious mind play that people naturally enjoy. Why should a student not also have this experience in his or her studies? In continuing efforts to prepare students for college and career by emphasizing STEM learning, the creative process of analyzing incomplete narratives of

both the real world and fictional worlds is often neglected. Rather than use the acronym STEM for science, technology, engineering, and mathematics, another acronym is available that reminds educators of the importance of creative thinking in all of these efforts: STEAM. The A is for arts.

The website stemtosteam.org explains that the Rhode Island School of Design first put forth the effort to include arts education in STEM-based pedagogies. Citing a need for innovation in STEM fields, the site argues, "Art + Design are poised to transform our economy in the 21st century just as science and technology did in the last century" ("STEM to STEAM"). This shift places a major value on the kind of innovative thinking that can come from encouraging artistic expression in students. By using the arts to teach creatigation, educators may be able to place a stronger emphasis on the skills employers value and the ones the 9/11 Commission acknowledged were lacking at a critical time in our nation's history.

Standard project management procedures include planning ahead for crises in order to mitigate delays and other problems. This requires the creatigation that was lacking, at least at a crucial time in the Clinton and Bush administrations: a systematic creative practice of thinking through the narratives of things that have not happened – essentially fictional, hypothetical events – and to learn from them. From this perspective, it is clearly a critical skill. In *The Storytelling Animal*, Jonathan Gottschall writes that "story is for a human as water is for a fish – all-encompassing and not quite palpable" (xiv). In other words, narrative makes up the world in which we live and is necessary for life. Everything is part of a story, and human beings respond well to this structure of analysis. Gottschall suggests, too, that visual and auditory stories may be particularly

effective at eliciting empathy and sending important messages to audiences because of mirror neurons that exist in our brains to tell us to learn from what we are witnessing. This may explain why we laugh and cry during films, or why we feel fear after campfire stories that we know are not true (62).

Dr. Raymond A. Mar, et al., published a paper in 2010 documenting the results of a study called "Exposure to media and theory-of-mind development in preschoolers." In the study, the team found that "inferred exposure to children's storybooks predicted theory-of-mind abilities. Inferred exposure to children's movies also predicted theory-of-mind development, but inferred exposure to children's television did not" (Mar). Annie Murphy Paul used this study in her *New York Times* article called "Your Brain on Fiction." The assumption is that, in being read to and brought along to films, young children also have the opportunity to engage in creative discourse with their guardians, whereas in the activity of watching television, children often find themselves left alone and not guided to think critically about the stories they see.

This guidance through story is essential because it helps develop the mind that is not yet accustomed to understanding cause and effect or making focused, imaginative connections. Stage plays may have more of a profound effect than television, as well, because of their live experiences and opportunity for discourse afterward.

Though his work focuses on theatrical activities rather than STEM or STEAM initiatives, Augusto Boal, in *Theatre of the Oppressed*, addresses the purpose of *live art* and performances of narratives. He notes that we have invented the art of weaving to create clothes that protect our bodies from the elements, and we have advanced the art of medicine to restore our organs when they would shut down. This is a clear

parallel to the importance of creatigation across a variety of fields that go far beyond "art for art's sake." These and other technologies that today's educators often label STEM, Boal refers to as "art." He explains, "That is the purpose of art and science: to correct the faults of nature, by using the suggestions of nature itself" (Boal 9). In the work of educating our students to prepare them for college and careers, Boal's lesson must be remembered: we use art in science to shape the world we want for our future. He adds, "The arts and sciences do not exist in isolation, without relation to each other, but on the contrary, are all interrelated according to the activity characteristic of each" (Boal 10). Viewing curriculum design through this perspective, it becomes more important to prepare students to make policies of the future by developing their creatigational skills through artistic exploration and critical thinking.

Boal's work has had a major impact on both education and games, spurring the creation of *Video Games of the Oppressed* and other related texts and movements. Mike Joffe, creator of the *Video Games of the Oppressed* blog, writes that "in order to reach a higher level of immersion most effectively, games need to be conscious of the alienation they start with. While 'immersion' has become a common buzzword in gaming, it rarely refers to the kind of existential, line-blurring immersion you find in reading novels or acting in theatre" (Joffe). This is an insightful point about immersion. Games, like school, are not always immersive or even entertaining. Both game and curriculum designers must understand where their work naturally falls short of immersion and explore how story and mechanics can draw the audience in. I extend much of what we learn in game design to levels of engagement in education, and I

believe these practices can apply to the storyline of school in general. Why are students not engaged? Are they alienated?

Unfortunately, in many learning environments, students are, in fact, left alone through much of their exploration, and they may consequently lack necessary guidance to develop creatigational skills. As the 9/11 Commission reported, a well-developed imagination could be imperative in global, life-saving situations. Therefore, it's this process of exploration and critical thinking that is perhaps most important to convey to students before they move on from the grade school environment. Broadway actor and professor Eric Booth, in "Creative Engagement in Schooling," writes, "When given free range, arts education becomes exemplary inquiry-based learning. Students are going to spend their lives and their careers solving complex problems. But we do a poor job in primary and secondary schooling of preparing them to effectively, creatively manage what they will encounter" (Booth). School, it seems, does not teach the story of real life. Instead, it teaches something significantly less engaging, and it lacks real training in creative problem solving. These creative problem-solving skills are, as we are seeing, essential skills for success and survival.

Dr. William E. Sedlacek, in "The Case for Noncognitive Measures," provides a close definition of what I am calling the creatigational skills: "variables relating to adjustment, motivation, and student perceptions, rather than the traditional verbal and quantitative (often called cognitive) areas typically measured by standardized tests" (Sedlacek). These are competencies measured by a person's ability to function in the academic and working worlds, rather than competencies measured by traditional skill sets in grammar, math, and science.

Taking his analysis of these skills even further, Sedlacek adds, “While noncognitive variables are useful for all students, they are particularly critical for nontraditional students, since standardized tests and prior grades may provide only a limited view of their potential.” Sedlacek identifies nontraditional students as ones whose race, gender, background, or other personal factors may cause them to feel like or be viewed as outsiders. For the next several years, at least (as future trends in education are likely to favor online more and more), I would extend this “nontraditional” term to include students whose classroom experience takes them away from real-time human interaction and instead brings digital learning to the forefront of their studies. For these online students, lessons that can improve creatigational skills are indeed powerfully important, as the digital learning environment does not currently allow for frequent, more traditional, human-to-human interactions to take place. (Sedlacek). Storytelling, in particular, offers a strong connection for online students to creatively navigate the human experience. Schools facing the requirement to take lessons to digital environments may be able to improve the storyline of school. They can make use of a narrative structure that hinges on choice to guide students’ critical thinking and creative engagement.

Jerome Bruner did much work to analyze the impact that narrative has on people. In “The Narrative Construction of Reality,” he notes that he intends to show how “narrative organizes the structure of human experience” (Bruner 21). He shows that people engaged in a culture, whether it is a traditional community, a family, or a workplace, must be able to enter into the common linguistic discourse through the overall narrative and symbolic systems of that culture. School, too, both online and brick-and-mortar, has a linguistic discourse and symbolic culture that can be compared to game

design mechanics of the entertainment industry. However, without the benefit of an engaging cultural narrative in school, students may fail to enter into this discourse or even consider it, and thus fail to reap the potential benefits of the instruction they're receiving. In fact, the lacking story contributes heavily to the sense of meaninglessness in the game of school.

This significant ability for narrative to have an impact on our brains is the very reason the story of school – and, consequently, the game of school – should be improved.

As Bruner illustrates, cultural narratives rely on a number of factors to make them effective and lasting as cultural structures. If the conditions are not met, the culture may not stick. Cognitive conditions must also be right in curriculum, according to Daniel T. Willingham. In *Why Don't Students Like School?*, he writes "People are naturally curious, but we are not naturally good thinkers; unless the cognitive conditions are right, we will avoid thinking" (Willingham 3). Essentially, we may be able, through testing and research, to determine where the traditional cognitive condition falls, but without using our natural curiosity, there is actually no point in trying.

Willingham likely found his inspiration for this provocative statement (that we will avoid thinking unless cognitive conditions are right) from Paul J. Silvia, who studies interest and its effect on people. In his article "Interest: the Curious Emotion," he identifies the importance of making school enjoyable. "Beyond infancy, interest is a source of intrinsic motivation for learning. When interested, students persist longer at learning tasks, spend more time studying, read more deeply, remember more of what they read, and get better grades in their classes" (Silvia 58). Engagement is clearly a critical element of successful teaching, but Silvia adds an important observation: interest can lead

to unsafe behaviors, as well. For example, a person might experiment with drugs or other dangerous activities because they are unfamiliar and, therefore, interesting. He writes, "Nevertheless, it is because unfamiliar things can be harmful that people need a mechanism that motivates them to try new things. One never knows when some new piece of knowledge, new experience, or new friendship may be helpful" (Silvia 58). This is a strong argument for creatigational skill development, which may not only encourage experimentation with new, positive things, but will also encourage consideration ahead of time about what dangers may lie ahead and how to avoid them.

In *Made to Stick*, Chip Heath and Dan Heath explore how to get and keep an audience's attention. This question is particularly interesting to educators, who battle for students' attention constantly. Especially for those of us who create online courses, the concern that a student might drift away intellectually, ignore a video, or scan through a page of material is always at the front of our minds.

The authors of *Made to Stick* reference an article by Dr. Robert B. Cialdini, a science professor at Arizona State University who described his search for a better way to address course material. After reading several texts, Cialdini found the most successful ones opened with mysteries or puzzles that encouraged the readers to keep going in order to find the answer. He tried this in his own face-to-face class, opening with a mystery and closing class with the resolution. Once, he tried not revealing the answer at the end of class. "Normally, 5-10 mins before the scheduled end time, some students start preparing to leave. We all know the signals: pencils are put away, notebooks folded, and backpacks zipped. In this instance, not only were there no such preparations, no one moved when

the bell rang. In fact, when I tried to end the lecture, I was pelted with protests" (Cialdini 25).

In his efforts to increase student engagement, Cialdini used this experience and others to develop a method for keeping classrooms interested. His method, described in the article "What's the Best Secret Device for Engaging Student Interest? The Answer is in the Title," involves moving through a sequence of guided creative thinking steps, always giving students "the opportunity to offer their own speculations and explanations. They should be asked to consider how these explanations could account for all the evidence revealed up to that point, and for new pieces of evidence that you reveal. At the end of the sequence, the students should be asked if they could develop an alternative explanation that fits all of the evidence" (Cialdini 28). This guided wayfinding through creative thought to examine a variety of paths and evaluate possible outcomes and meanings gets to the heart of what creatigation is meant to do.

Cialdini's example is reminiscent of Juul's incomplete worlds observation: the students were most engaged when they *didn't* get the information they wanted or needed. "We know where we're headed – we want to solve the mystery – but we're not sure how we'll get there" (Heath 82). The mystery sequence that Cialdini employed was a gamified, storied method of getting students' attention – and it worked.

Educators have been trying for years to gamify school, since *Lemonade Stand* in the 1970s, and possibly even earlier, in an attempt to engage their learners ("A Brief History"). While video games reign supreme over the attention of a large population of students, many educators suspect that the answer to the everlasting question "Why don't students like school?" is simply that school isn't enough like a game. Or, as Willingham

writes, “we like to think if we judge that the mental work will pay off with the pleasurable feeling we get when we solve a problem” (Willingham 13). One important aspect of games that does provide the pleasurable feeling Willingham describes is the method of thoroughly preparing players for every challenge, meeting that sweet spot between too easy and too difficult. School does not always leave students with the same, balanced feeling of being prepared for a challenge.

One problem is the desire to present students with facts that do not alter their view of the world as it has been established at home. This is a difficult line to walk, as, to some degree, parental wishes must be respected. Adding to this, though, is the fact that students are not shopping for 2 plus 2 equals four and then going home, successfully prepared for the world. Instead, education serves to prepare students to make choices, many of which will be difficult and will be fraught with dilemmas. In history class, students learn dates, names, and events. Teachers provide these examples as foundations for what is happening now and what is to come. Without employing imagination, the lessons become mere memorization efforts. Creatigation is a skill that children must learn, just as much as they must learn history and other core subjects, not only so they can remember what happened in the past, but so they can interpret the past and make decisions about what happens in the future.

Could this be better left for home instruction, instead? Absolutely not. To begin with, classroom studies will have more impact if they are engaging students in creatigation, sparking interest. But also, if parents hold the sole responsibility for teaching creatigation, then creatigation becomes part of a class divide, as only those guardians who have time, education, and resources to manage creative instruction at

home will be able to assist their children with this development. Those privileged children may come to class ready to independently creatigate thanks to a home life that supports creative thinking and action, but others will be forced to shop for 2 plus 2 in school and then go home, uninspired and unprepared for success.

It is not only presenting education as a simple shopping event that blocks students from feeling engaged. Willingham adds that "working on problems that are too easy or too difficult is unpleasant. Students can't opt out of these problems the way adults often can" (13). Because of this frequent issue with boredom and frustration in schools, Willingham believes students don't enjoy class. This is a common complaint about video games. If they are too easy or too difficult at the outset, there is little buy-in, and players move on to another title. In school, of course, moving on isn't as simple.

The solution that many educators have banked on is to create new games to jazz up otherwise boring lessons. Andrew Miller, on edutopia.org, attempts to debunk the prevailing myth that game-based learning means educators should simply interject games wherever they can fit them in curriculum. Game designers suddenly have a new demand: create fresh versions of today's popular games – only make these versions more educational than recreational.

Does it work? The research is difficult to analyze at this point, says Dr. Douglas Clark of Vanderbilt University. "In recent years, there's been this emphasis on whether games are better than traditional instruction, but that's not really a helpful distinction because it's not an either-or-concept," he says. "The research shows that games as a medium can be effective, but not always. Design is really what matters. Nobody assumes that all lectures, labs or books are good simply because of their medium." Dr. Clark's

statement is an important one for educators who are seeking to gamify their classrooms: is a game better than traditional instruction simply because it is a game?

That is a major question of this research. Using a specific, narrative genre of game known as the visual novel (VN), the study seeks to improve the storyline of school. It will examine possibilities for developing creatigational skills, increasing engagement, and conveying necessary learning from curriculum through play.

CHAPTER TWO: LITERATURE REVIEW

"Those texts that dramatize narrative situation, contract, and transaction may most patently demonstrate the value of a transferential model" (Brooks 235).

Though a large number of texts and games contributed to my understanding of these topics, several stood out as particularly inspiring for this study – and a great many more are still yet to be explored. My literature review has been divided into two sections: Text-driven literature, which includes books, articles, and studies; and Story-driven games, which includes visual novels, software, and other relevant game examples.

Text-Driven Literature

In interrogating the efficacy of gamified, narrative choices to develop creatigational skills in students, I encountered four main topics to unpack: gamification, narrative theory, branching narratives and games, and so-called "non-cognitive" or "soft" skills – referred to in this work as creatigational skills. A large body of work is available on each of these topics, but few publications tackled all of them as one project together. That was the aim of this study, and therefore my goal was

to select literature that would inform and deepen my understanding of each topic so that I could make the appropriate connections within.

One of the main questions as I conducted this research was "When we present information to our students, do they understand how they are supposed to navigate it to reach an answer?" From here, I was interested in whether they feel agency – and, if not, how they could gain agency. If they do feel agency, is it ever possible to have too much? Most importantly, I was interested in why students should care at all about the material we teach them.

Jesper Juul's *Half-Real: Video Games Between Real Rules and Fictional Worlds* offered the insightful and ultimately crucial observation about incomplete fictional worlds that I relied upon in my research. Much of my readings and thoughts about why students should care centered on this question of incomplete worlds and how other theorists' work could enhance or deconstruct my view of these deliberate mysteries in narratives.

I found several other sources that used this concept in varying ways, focusing on the importance of creating mysteries for students to solve through creative thinking and navigation through problems.

An additional element of Juul's research that provided a valuable insight into education is his description of "incoherent worlds" in video games. This, paired with other scholars and writers on the topic of education, demonstrated to me a clear lack of transparency, agency, and meaningful direction that students feel when they arrive at school. It became clear that there was much to learn about curriculum design that had already been studied in game design.

As I studied game design and educational gamification, I often turned to *The Game Believes in You: How Digital Play can Make Our Kids Smarter*. This accessible book uses a consistent storytelling style – perfect for my purposes – to provide an overview and analysis of many games and research projects that have assessed the role of gamification in school. I used this book as an example of varying methodologies, as well as a resource listing of studies and titles that had already examined elements of game-based learning.

Kurt Squire wrote a resource I turned to often, called *Video Games and Learning: Teaching and Participatory Culture in the Digital Age*. I particularly pulled from his examples of games that encouraged students to continue their learning independently and often in artistic ways, which I labeled another instance of creatigation.

Squire challenged me with this text by sharing game titles that have extensive fan followings, but utilize little or no story at all in the overall design of the games themselves. As my research kept pointing me in the direction of meaningful narrative structure with characters and stories to maintain or increase engagement, I found these examples fascinating. What I learned most was that there are different types of games, and only some are suited to what Squire describes as meeting the need of education to "enhance life out of school" (Squire 181).

This is where I began looking into the different types of gaming experiences a player might have. Ian Bogost wrote *How to do Things with Videogames*. In it, he describes the difference between "lean forward" and "lean back" media, and how we might leverage these to accomplish our goals. This insight led to a deeper look at a

specific type of video game that we might call “lean back” media, though they also require players to “lean forward” intellectually, creatively, or emotionally.

Bogost himself generally considers these “lean back” games to be meditative, and he compares them at one point to Thoreau’s meanderings at Walden. Interestingly, *The Game Believes in You* examines a game that seeks to recreate the philosophical experience gained from reading *Walden*. However, though I agree that meandering meditation is possible and often even popular in games, I extended Bogost’s “lean back” concept to otherwise quiet, relaxing games that inspire creatigational skills by asking players to “lean forward” creatively and intellectually.

In *The Storytelling Animal: How Stories Make us Human* by Jonathan Gottschall, I gained critical looks at the ways in which narrative has shaped humankind and continues to do so. From this neuroscientific view, I connected concepts of creatigational skills and the clear cognition involved in creative thinking.

For theories of narrative and how I would choose to define the word “narrative” for the purposes of this study, I consulted many texts. Two in particular became my regular references: *Narrative Theory: Core Concepts and Critical Debates,* by David Herman, et al., and *Reading for the Plot: Design and Intention in Narrative,* by Peter Brooks. These two works provided different views of narrative theory, and both were central to the development of my thesis. In *Narrative Theory*, I was able to draw from a variety of essays from different scholars’ viewpoints, all of them systematically defining, in their own terms, various characteristics of narrative. From these texts, I gained the knowledge I needed to create my own vision of the narrative of school. In the work by Brooks, I found fascinating examples of narrative at work: “Those texts that dramatize narrative

situation, contract, and transaction may most patently demonstrate the value of a transferential model" (Brooks 235). Seen through the eyes of Freud's patient analyses, this text helped extend my definition of narrative beyond fiction to a real-world context in the classroom.

Though his work may seem misplaced among the other titles in my Works Cited page, Augusto Boal's *Theatre of the Oppressed*, which pulls from the Paulo Freire work, *Pedagogy of the Oppressed*, offered crucial examples of the A in STEAM and why it is necessary. Boal's work came before STEM and STEAM initiatives, but the statement of his philosophy that the sciences and arts are not separate, but one, guided much of my thinking in the origin of this study. In addition, his work views the connection between spectator and actor, naming a spect-actor, and envisioning the work of performance as a way to negotiate problem resolutions. This level of engagement is central to my concept of creatigation. Also of critical importance is his observation that creative thinking empowers students and gives them control over their world.

I also concerned myself with defining engagement, as it is what I call the current "holy grail" of pedagogy. As the title of this text states, school has a storyline; it's just not any good right now. The story of education, as students experience it, lacks engagement. To resolve this problem, I analyzed a number of documents, surveys, and texts, including the Federal Government's 2016 National Education Technology Plan, which emphasized the importance of games in the future of education, and a 2015 Gallup survey of students that assessed their engagement levels. The findings of these

studies pointed at games for increased engagement, but specific and deliberate game design.

Finally, one of the most influential pieces I read in my studies for this project was Andre Malan's web article entitled "School Is Just a Game… Let's Make It a Better Game." This thoughtful article provided invaluable insights and inspiration for my research. Specifically, Malan breaks down the similarities already apparent between school and games, and then he identifies the ways games usually have a meaningful storyline for their mechanics, while school does not.

There are, of course, counterarguments to Malan's breakdown. For example, not all school structures follow such rigid requirements that mean students who do poorly at one point in their early academic careers are doomed to be failures for the rest of their lives, as his statements sometimes suggest. Though the differences between school and games may not always be quite as severe as Malan makes them out to be (though in some cases they absolutely are), it is worth examining the simple question of why games are usually fun and school is usually not. In fact, this may be a simple question, but the answer is markedly difficult to find, and it may be just as important as it is confounding.

Story-Driven Games

Because the focus of my study was visual novels, I chose to analyze a variety of visual novel styles, as well as the software available for independent creation of

them. I supplemented this with adventure games, which are also story-driven and can often resemble visual novels in their narrative structure. Each one of these games is driven by story and makes excellent use of mechanics to establish what Juul would likely call coherent, incomplete worlds – worlds that, in my view, have the capacity to encourage creatigation.

One of the most elegant designs I discovered was Christine Love's *Analogue: a Hate Story*. It seamlessly blends game play with reading, motivating players to interact with characters in ways that generate emotions, empathy, and a number of other creatigational skills. For a time, I considered not including this game among my research simply because it is so complex as to be an unreasonable example for most curriculum designers to recreate. However, while creation of a VN of this caliber is an unlikely goal for most busy educators, the elements of its narrative and game structure are well worth analysis.

9 Hours 9 Persons 9 Doors, published by Aksys Games, is a compelling VN that managed to achieve mainstream popularity on the Nintendo 3DS. While it is difficult at times to distinguish the draw of the story's shock value – it has a distinct *Saw* film vibe – from the pull of the blatantly educational puzzles – it covers everything from science to the history of the Titanic – the success of this game in an underrepresented genre alone warrants a closer look.

At the time of this writing, Cardboard Computer had still not released all five acts of its literary adventure game, *Kentucky Route Zero*, but that does not diminish its compelling use of metonymic narrative to offer branching choices that make no changes to the plot, but nonetheless make emotional changes to the story. This title,

finished or not, is an important game that can provide critical insights into the encouragement of creative thinking.

The VN builder Ren'Py is still considered the industry standard for most independent VN writers and designers, but it can be tricky to learn the coding required. My aim was to identify a software that teachers or instructional designers might be able to pick up without too much struggle. This site is a fantastic resource, however, for finding countless examples of VNs and analyzing their tropes, as well as what student-aged VN players expect in their games.

Twine is another option that I considered for the creation of my games. It has a fairly intuitive user interface and is customizable in a number of ways. I ultimately did not decide to do my VN work in Twine, however, because it is not created specifically for ease of building VNs.

There are several other similar software options for creating branched stories with gamified elements. Some do not allow for the inclusion of visual elements, which I found was a strong element in engagement, and others were expensive, difficult to understand, or too restrictive in their design for school activities.

My final choice was TyranoBuilder, a relative newcomer to VN and game-building software. Its advertised benefit is that little to no coding is required, and creating VNs has been made simple through its intuitive user interface. I decided to test this out to determine how easy or difficult it might be for a teacher or school team to create original VNs for use in curriculum.

CHAPTER THREE: NARRATIVE CHOICE

"His name is Homer."

"His name is Blue."

"Just some dog; I don't know his name" (*Kentucky Route Zero*).

This is one of the early set of options available to players in the literary adventure game, *Kentucky Route Zero*. The world opens up as if it is taking place on a stage, framed and often silhouetted, and players quickly receive a prompt to choose the name of the protagonist's pet dog. This decision ultimately has no bearing on the outcome of the game, but it absolutely weighs in on the meaning of the game and for the player and his or her interpretation of the main character's personality.

In *How to Do Things with Videogames*, Ian Bogost states that "Videogames, people say, are a 'lean forward' medium, while others are 'lean back media'" (Bogost 89). In other words, the games we often think about when we discuss video games are asking players to interact in high-stakes situations. Bogost uses this prompt, in a way, as a challenge to explore games that are intentionally designed for "lean back" play rather than the more mainstream first-person shooter, racing, and sports games that most people see in commercials. Bogost refers to these examples as "Zen" games, mentioning such titles as *Journey* and *Animal Crossing*. Rather than asking players to experience the thrill of high-intensity combat or speed, these titles are meant to be relaxing, introspective, or even meditative.

What is notable about these Zen games is that they often grant players enormous agency over the way they will play their games. In *Journey*, players receive an early ability to communicate with one other anonymous player at a time by making a soft, musical tone. What this tone means in the context of any play through is essentially up to the players themselves. There is no other ability to chat. Thus, as the game goes on, the journey of *Journey* relies increasingly on how the players choose to interpret it. In *Animal Crossing*, players get to not only live out imaginary lives and decorate imaginary homes as they please, but they also have the option to change the landscape of their fictional town in any way they like.

In other words, these "lean back," casual games may encourage players to relax into their chairs, but, by utilizing a choice-based narrative structure, they encourage players to "lean forward" intellectually. The end result is an exercise in engaged, creative thinking – or creatigation of these fictional worlds.

Kentucky Route Zero is, in many ways, a Zen game. It expects players to experience no heart-stopping, typical lean-forward excitement. Rather, the mechanics of the game ask players to engage in sustained consideration of texts, music, and images, making choices about how to imaginatively color the fictional world simply for the benefit of the player, though there will be no change the story's outcome at all. This is absolutely a lean back game, as defined by Bogost, but intellectually, creatively, and emotionally, players must lean forward.

It is this sense of control over a world – this feeling of choice – that engages many gamers and has led to the rise of "open world" systems and stories with branching narratives in both "lean forward" and "lean back" titles. "The degree of engagement by a

user within an interactive narrative lies, to a great extent, with the user's perceived degree of *control* over her character as she operates within the environment" (Riedl and Young). This paper refers to games specifically, but the importance of perceived control may also apply to other narrative structures, whether they are traditionally considered interactive or not. In *Narrative Theory*, Brian Richardson examines Italo Calvino's *If on a winter's night a traveler*, in which every other chapter is written in second person. He looks at this use of second person (a point of view at least partially at play in nearly all video games), and he finds its effect in what he calls antimimetic or sometimes autotelic literature. His findings are that many of these pieces "require the reader to act as a kind of collaborator, producing the interpretation of a multiform, protean work" (Herman, et al. 158). This creates a "you," second person experience, where the reader participates intellectually and creatively in self-reflection through the story.

It is worth noting that students may experience boredom in school for any number of reasons, not all of them necessarily related to the need for a deeper, second person experience. The material may be too difficult or too simple. It may not feel relevant. Games are in a unique position to address many possible challenges when it comes to boredom, as they are designed to never be too hard or too easy, and always to immerse the audience.

Indeed, game players who experience choice – or, say, encouragement to look within themselves to decide what name they would like to imagine the unremarkable dog character should have – become collaborators in the development of the narrative in a game. The entire experience is autotelic in nature, and it forces players to lean forward intellectually in order to achieve creatigation through the story.

Games, of course, often present players with choices that encourage them to reflect critically on what they're doing. Story-driven games tend to do this as a rule, and this has lead, in recent years, to a popular pattern of ethical dilemmas appearing in narrative gaming. Brandon Perdue, in "Ethical Dilemmas and Dominant Moral Strategies in Games," writes, "As video games have become an increasingly narrative medium, it has become popular to pose moral choices to the player. The possibilities here are promising: because games allow designers to build choices that a player must make, and consequences for those choices, video games can arguably offer profound experiences in which players must consider the implications of their (virtual) actions" (Perdue). This understanding of the implications of any player's actions is a major component of the creatigational skills a student will need to develop to become college and career ready. When games are added to curriculum, they may have the opportunity to do more than simply engage learners in something fun. If they take the narrative of the course and add an opportunity for students to make a choice, educators may engage learners in something both fun and significant to learning.

Of course, it is simple to code a binary choice system. What is important is to consider whether the act of creative thought and choice leads to a deeper understanding of how to handle more difficult choices at other times – perhaps even choices that address morality. If creatigation is going to have an impact on students' lives beyond merely teaching them to select option B over A, it must engage them in situations that expand their thinking beyond true or false scenarios. This is where story becomes critical, as games may provide entertaining ways to deliver curriculum, but it is the story that can encourage creatigation through an ethical dilemma.

Decision Paralysis

And yet, the opportunity for choice in education or elsewhere is not always an instant success. In *Made to Stick*, Chip and Dan Heath address a persistent problem known as "decision paralysis," citing studies and examples in an effort to identify a common human characteristic that makes us "suffer anxiety from the need to choose – even when the choice is between two good options" (Heath 37). This is an important issue we must analyze early on in any pedagogical design process. Schools occasionally try to present students with a variety of options, from books to science projects, from electives to extracurricular activities. The question becomes how to give students agency over the narrative of their education without presenting unnecessary anxiety as an accidental obstacle.

Barry Schwartz, author of *The Paradox of Choice*, gave a TED Talk to demonstrate the thesis of his book: that an abundance of choice is not always a good thing. He shares an example of a doctor who offers several treatment choices but doesn't give a specific recommendation. Schwartz refers to this type of patient autonomy as "a shifting of the burden and the responsibility for decision making from somebody who knows something, namely, the doctor, to somebody who knows nothing and is almost certainly sick and, thus, not in the best shape to be making a decision, namely, the patient" (Schwartz). This is reminiscent of many English courses, where students receive instructions to complete a book report for an important grade, and the first task is to

select from a long list of books. When the students have no frame of reference for any of the titles on the list, how can they feel confident about the selections they make?

Unfortunately, Schwartz's argument soon devolves into examples of how our world is falling into disarray because there are more societal options today regarding gender identity or the decision to get married. Though his thesis contains logical pitfalls, it is worth exploring the problem of excessive choice when he cites examples of companies having more employees participate in retirement fund programs when there are fewer retirement options. "The more options there are," Schwartz says, "the easier it is to regret anything at all that is disappointing about the option that you chose." Clearly, we face choices every day of our lives. Retailers offer us options, and we're able to make purchases without giving up in a state of anxious perplexity. In addition, most games successfully offer players choices as a core mechanic without players falling prey to decision paralysis. How does this work?

Schwartz feels it has more to do with the amount of choices a person has to face. "Adding options to people's lives can't help but increase the expectations people have about how good those options will be, and what that's going to produce is less satisfaction with results, even when they're good results" (Schwartz). In fact, Schwartz assigns blame for a rise in depression and suicide in affluent, western societies, in part, to too many options and drastically raised expectations. He agrees that some other societies in the world clearly do not have enough options to live fulfilling lives. Thus, his finding is that there must be something in between too few options and too many.

However, in 2010, a study entitled "Can There Ever Be Too Many Options? A Meta-Analytic Review of Choice Overload" published findings that appear to dispute –

or call into serious question – Schwartz's popular claims. "Although strong instances of choice overload have been reported in the past, direct replications and the results of our meta-analysis indicated that adverse effects due to an increase in the number of choice options are not very robust" (Scheibehenne 421), the study concludes. In fact, the research identified specific conditions under which it appears that "more choice is better" (Scheibehenne 421), particularly for consumers who have already defined their preferences ahead of time. In the case of students, at least, this is likely not going to be the case, as they are not engaging in purchasing activities when they creatigate, but instead are using their minds to weigh out options and hypothetical scenarios.

Working from the concept of self-determination theory, which holds that there are three needs "essential for positive social development as well as growth and integration" (all critical elements of creatigational skills): competence, relatedness, and autonomy (Beymer 106), Patrick N. Beymer and Margareta Maria Thomson explore the use of choice in classrooms and whether a lack or abundance of decisions can have an effect on engagement in learning. When these three needs of self-determination are met, the research indicates, "enhanced self-motivation takes place" (Beymer 106). The problem in school, as Beymer and Thomson see it, is that, as students are maturing and naturally seeking more autonomy, schools "appear to reduce choices and tighten controls" (Beymer 108). The result is that "Intrinsic motivation seems to decline across grade levels, while extrinsic motivation changes very little" (Beymer 108), and relevance and interest in studies may decrease.

The study concludes with suggestions for educators who are seeking ways to include meaningful choice in their curriculum. "When trying to motivate students,

educators may want to consider providing choice to create feelings of competence and autonomy among students, while avoiding overwhelming students" (Beymer 116). They note that specific conditions must be met in order for the choice to be meaningful. To begin with, choice must be paired with interesting tasks. It must also come with a demonstration of relevance so that students can see the meaning and value of their work, as well as how it connects with other important ideas. In addition, teachers may find it useful to give students some way to understand the material prior to making choices. "If students do not feel that they have some sort of expertise in a particular area, they may view choosing as undesirable and overwhelming, which may lead to an ineffective choice" (Beymer 116). Here, we are reminded of Schwartz's doctor/patient example, in which a patient, who has no expertise in medicine, is faced with a variety of medical options, and the doctor, who is the expert, expects the patient to decide what is best. An increase in anxiety seems relatively obvious when someone must select from among options that he or she does not understand. This is why Beymer and Thomson's recommendation of giving instruction prior to choice is so important.

Appearing to further agree with Schwartz's concept of too much choice, Beymer and Thomson also recommend providing "smaller choice sets for assignments to avoid choice overload" (Beymer 116).

In essence, what we find from these studies is that decision paralysis may or may not exist, and that it is likely a much more nuanced topic that requires careful observation in a variety of circumstances. A student's sense of meaningful autonomy does appear to increase as choices become available, but the conflicting current research means that choice in the classroom must be carefully guided. For the purposes of developing

creatigational skills, this appears to be a strong plan, as students are neither totally lacking in experience nor masters of their world. They are still in a position of needing guidance, and the goal of teaching creatigation is to provide this guidance, in part through offering carefully selected, meaningful choices for them to consider.

Game design often follows a similar structure, in that many games assume the player wants autonomy but still requires guidance through the world. Notice that, in *Kentucky Route Zero*, the player did not face a daunting blank input box for the dog's name. Nor did the player scroll through twenty options. The dog was Homer, Blue, or he had no name at all.

In our efforts to encourage students to think creatively, it is critical to guide them in their decision-making processes by providing narrative structure and meaning to their options, as well as to reasonably limit the choices they have to face. Especially when a grade is on the line, and anxiety may already be increased because of pressure to succeed, students will need navigational guidance through their experiences.

This is something games have done well for years. Just as curriculum often scaffolds lessons to build on previous knowledge, video games begin with tutorial or simplified levels to train players for upcoming scenes that will require certain skills. Generation Z, born between 1996 and 2010, is more than a generation of digital natives; it's a generation of digital descendants. We've moved past the age where you sit down to read the manual. Now we sit down and begin interacting.

This isn't the only change apparent in the newer generations. According to "Teen Generation Z is being called 'millennials on steroids,' and that could be terrifying for retailers," one key difference between Millennials and Generation Z is that Millennials

have more patience with technology than younger software users. If a website fails a Millennial, he or she will likely refresh the page. It's what they're used to, after all. They grew up in a time when technology was advancing, which means they grew up using technology that wasn't always up to speed. Generation Z, however, will encounter a broken website and instantly move on (Schlossberg). To this fresh batch of students, technology simply ought to work, and when it works, it should let them interact immediately. Of course, things often don't work the way they should, and professionals remain employed because they are expected to fix those things. This attitude about technology is another example of a potential issue that education must seek to resolve before current students develop an inability to tackle problems for any length of time.

The favorite technology of Generation Z offers choice, as well, but it deftly guides users through limited options, scaffolding their experiences until they are comfortable with navigational abilities on their own. Take a look at YouTube, a website that half of Generation Z "can't live without," according to a 2017 study (Bazilian). There is certainly no lack of options there. And yet, the site makes clearly categorized recommendations, guiding users to the channels most likely to interest them based on their moods, search histories, and previous channel subscriptions. In many ways, YouTube offers only the *illusion* of limitless choice at first, allowing visitors to get used to what is available before striking out on their own.

The goal in this study is to encourage a heuristic style of learning through visual novels (VNs), which engage players in the practice of decision making. In addition, scaffolding in curriculum design (also used in the increase of player skill within video games) will be critical. As students develop mastery, they must feel comfortable

practicing creatigation within an environment that is going to challenge their minds without overwhelming them with too many options – or failing to demonstrate how those choices may be meaningful.

Game Design

Storytelling, especially in games, can do much to create an illusion of choice that motivates the audience emotionally and engages them creatively. As a grassroots alternate reality game (ARG) designer, I worked closely with others to develop this illusion so that we could allow players to interact with our live stories without completely derailing the plot.

It may be useful to distinguish ARGs from AR (augmented reality), which is a common misunderstanding. Certainly ARGs may make use of AR, but an ARG is a much larger, interactive narrative structure that may span a variety of digital environments as well as spaces in the real world. At some points, players function as television viewers or novel readers as they follow along with a story, but at other points, these players also use virtual and actual spaces to engage with each other and even the characters of the story. During these interactions, players usually have some degree of impact on the events of the story itself. An ARG is a complex narrative structure that requires extensive planning and constant, real-time maintenance on the part of the designers.

A small ARG project I worked on, known as a series of seasons in *Transition Village*, was primarily an emailed, text-based, role-playing game. I wrote and designed

the entire world and spent countless nights up late, drafting email after email to send to players who would instantly post them online for other players to analyze. These games always had one central goal, but I allowed players relative free reign within the story world to behave as they liked, as long as they made forward progress toward that shared goal.

Jane Doh, in an article for *ARGNet*, summarized the several episodes of *Transition Village* that we ran periodically over a few years:

> "In between full-scale ARGs, the grassroots team runs 'episodes' of *Transition Village*. During these campaigns, gampeplay involves emails between the 'narrator' and individual players, and the overall plot manifests itself through these interactions. Each 'performance' of *Transition Village* is designed to narratively connect one game to the next. Through cooperation and creative interaction with the gameworld players successfully revived Earl from the dead and also prevented the destruction of the village itself." (Doh).

Though players were able to direct their own stories by telling me what their player personalities were like and wishes within the story world were, I deliberately restricted their movements at the same time. When a player "arrived" in Transition Village, I never wrote simply "You are in a house. What do you want to do?" Instead, I described a few interesting items in the house, like a door with a puzzle scrawled on it, a dresser with three drawers, and a sink. Players instantly – and without much additional instruction – understood that they could select one of those items to explore.

In one thread, I prompted a player with the following:

> "You are in a musty room, standing on concrete. In front of you is a heavy door. To your left is an old, dusty chair. To your right is a kitchen table large enough for four, with no chairs. On the right wall are a sink and one cabinet. On the back wall are a gas oven and two faded spots where pictures used to hang. On the left wall are a twin-sized bed, a nightstand with a burnt-out candle, and a wooden dresser."

The player responded with a request to open the cabinet.

This restriction of movement gave players agency that I could control, but it created the illusion of larger choice. In fact, it hinted at the mystery of a larger world that they would navigate creatively in their own minds. Within the confines of the game, however, they could perform only one action per turn, and I had clearly provided them with a small list of acceptable actions.

James Jerome Gibson, in *The Ecological Approach to Visual Perception*, explains a term he invented to describe the way perception can influence action. He writes, "The verb *to afford* is found in the dictionary, but the noun *affordance* is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does" (Gibson 127). This term "affordance" is particularly relevant when it comes to story – and, in particular, stories with visual elements, such as traditional video games and visual novels. By way of explanation, Gibson describes an object that can be used for sitting. He shows that this object could be any of a variety of sitting objects, such as a bench or a chair, and the shape, color, and other visual

identifiers don't necessarily affect its purpose. However, in the case of any surface that technically meets the physical requirements of a seat, he notes that "it can in fact be sat upon," whether it's intended to be a seat or not. "If it can be discriminated as having just these properties, it should *look* sit-on-able. If it does, the affordance is perceived visually. If the surface properties are seen relative to the body surfaces, the self, they constitute a seat and have meaning" (Gibson 128). Students are constantly – we hope – being pushed to the limits of their understanding, and thus are learning new things about the world. It is creatigational practice that allows them to find connections and make new conclusions using their perception of affordances in objects.

In *Transition Village*, players solved a variety of puzzles and slowly worked their way out of an abandoned house and into a ghost town. There, they encountered non-player characters of my creation, as well as other real players who were navigating the same world in their own ways. I delivered their messages to each other through regular email updates. Often times these players collaborated with each other. Sometimes they chose to work alone. Always, they received subtle guidance from the game itself (me, as the writer), and yet they reported feeling immersed in the world and thrilled at getting to develop their own storylines.

Effective storytelling can take us to worlds we don't understand and teach us to creatigate affordances we may never have observed or considered in the real world. I am reminded of a scene in Philip Pullman's *The Golden Compass*, when an adult touched Lyra's daemon, and I instantly felt utter dread and disgust. I had not only memorized the facts that daemons existed in this world and that other humans were not supposed to touch them. The author, through his story, had engaged me in creatigation so thoroughly

that I had an *immediate and nauseated* reaction of horror when an evil character broke that taboo. Simply knowing how an object works in one obvious circumstance is an easy test question ("What must people never do to other people's daemons in *The Golden Compass*?" A. Touch them), but using the creative mind to navigate toward other meanings and possibilities is an exercise in building a larger understanding of the world.

While alternate reality games can be perhaps too complex and, at times, cryptic for success in an educational environment, visual novels (VNs) may instead hit a better note. In Christine Love's *Analogue: A Hate Story*, players begin with a task to uncover and analyze surviving text documents from a recently recovered, long dead spaceship. If this were the only goal and mechanic – to search through old documents – it would likely be overwhelming and even boring to the player. Where should he or she begin? Should the player read emails chronologically? Grouped by subject? By the characters who sent them? Why should the player care about any of this?

I think of this in terms of curriculum, as well. When we present information to our students, do they understand how they are supposed to navigate it? Do they feel any agency? Do they feel too much? And, most importantly, why should the student care about any of this?

This is why story, instruction, and guided choice are crucial to engaging the player in creatigation. To achieve this in *Analogue: A Hate Story*, Love introduces a personified artificial intelligence who opens documents a few at a time, asking questions along the way, and, it seems, clearly hiding something from the player. There is a sense of mystery that creates the story, and it encourages players to move forward. This is reminiscent of Jesper Juul's incomplete worlds, as players receive just enough

information at each new stage to realize there's more than meets the eye. The goal, then, becomes to uncover what the computer may be hiding so that it will release the final documents.

This game was so successful that Love released a sequel. In the sequel, a character asks the player to get up from his or her computer to bake a cake. Players not only did this; they posted proof of their cakes online. The system of guided choice through story worked so well that players were engaged beyond the medium of the story.

Teachers dream of such engagement.

CHAPTER FOUR: NARRATIVE THEORY AND VNS

"The narrator alone is insufficient to narrative; there must be a narratee as well. There must be a validated narrative contract for narrative to take place" (Brooks 225).

As many students of narrative theory will insist, when we discuss narrative, we must eventually determine what we mean by narrative, as there are disparate views of narration, storytelling, plot, and what a narrative is meant to be. Much of this study interrogates story as a method to engage students, and so it is pertinent to establish parameters on the definitions of the terms used here.

What is Narrative?

One definition establishes narrative as simply the act of telling someone something else. This has strong similarities to most pedagogies, even those that are considered innovative or are fully online. Most schools, both online and in brick-and-mortar classrooms, rely on the narrative act of a teacher (or web page) telling a student what he or she needs to know. At the end of this narration, the student demonstrates mastery by answering a set of questions or completing an assignment.

In terms of fiction, there is often a clear distinction between author and narrator that also has a parallel in the classroom. That is, in novels, films, television shows, plays, games, and other forms of fiction, we as the audience experience the narration that a

fictional character brings to us. Whether this is a first-person character or a godlike, third-person narrator, the presence who tells the story exists within the fictional world and has selected which scenes we should view. This is generally not the same person as the author, who has created the narrator and may or may not agree with the narrator's viewpoints. As Brian Richardson explains in *Narrative Theory: Core Concepts and Critical Debates*, "The concept of the narrator has been important historically for correctly dissuading readers from simplistically equating the author of a text with its speaker: T. S. Eliot is not J. Alfred Prufrock, and Vladimir Nabakov is not to be equated with the narrator of *Lolita*" (Herman, et al. 51). This is actually a key problem area for many students, not only in their studies of fiction, but in their comprehension of curriculum. A student might read "Harrison Bergeron" and believe Kurt Vonnegut felt this was a positive vision of the future. A teacher might assign readings from *Macbeth* and discuss the play at length, but, just as Nabokov fundamentally disagrees with his own character, that hypothetical teacher probably does not condone the violent acts depicted within *Macbeth*. In fact, plays like *Macbeth* often receive varied treatments on stage from actors and directors who understand that great works of fiction contain many different points of view. Indeed, much of the real world is also made up of situations that can – and should – be analyzed from a number of perspectives in order to get the full picture. Without discourse and encouragement to think creatively and critically, however, students will have trouble discerning the difference.

In truth, this teacher is not hypothetical, but represents countless teachers across the United States over many decades. The National Council of Teachers of English (NCTE) hosts an online position statement on students' right to read. In it, the documented

argument against *Macbeth* is that the play is "Too violent for children today." The NCTE responds with an open letter to the country about the right to choose what we read without censorship, quoting Justice William O. Douglas from 1951: "Where suspicion fills the air and holds scholars in line for fear of their jobs, there can be no exercise of the free intellect… A problem can no longer be pursued with impunity to its edges. Fear stalks the classroom. A teacher is no longer a stimulant to adventurous thinking; she becomes instead a pipe line for safe and sound information" (NCTE). It is the lack of a clear exchange in the narrative telling of a story – or any classroom information – that can lead to misunderstandings about teacher's positions on the topics students are studying.

The difference between author and narrator is not the only important separation to take into consideration as we delve into the meaning of narrative and how it connects to – even guides - pedagogy. Robyn Warhol, in *Narrative Theory: Core Concepts and Critical Debates*, also distinguishes between an "actual reader" and an "implied reader," both of whom are essential to the narrative itself. "The implied reader is a virtual being," she writes. "The actual reader lives in history, subject to the vicissitudes of cultural norms for gender and sexuality that sometimes seem dazzlingly mobile… and at other times frustratingly fixed" (Herman, et al. 146). These actual readers have real bodies in the current time, and those bodies, Warhol explains, are subject to countless demographic concerns of today. The way actual readers intervene with narratives will likely differ from the way the implied readers did – or would have done. This necessitates an exchange between author and reader in order to fully comprehend a text's meaning, though that may be impossible if the author is long dead. Warhol notes that fans of Jane

Austen have established many online communities where they can engage in actual-reader discourse that allows them to continue their exchange with her texts.

Thinking of a teacher as the conveyor of narrative, this transference becomes crucial to the learning. Without an exchange between student and teacher, the narrative of a class often has little lasting effect or real-world connection. In fact, as Peter Brooks argues in *Reading for the Plot*, understanding the motivation for narrating is essential to understanding the story itself. "The shapes taken by stories and the reasons for their telling suggest the need to explore more fully the narrative *in situation* between teller and listener – and the kinds of reaction and understanding that narratives appear to want to elicit" (Brooks 216). Brooks explores narrative as a contract between teller and listener, much as Roland Barthes identified in *Thousand and One Nights*, and yet, Brooks finds that "contract" fails to get at the heart of what a narrative does, and a more dynamic description is needed. He finds help in Freud's concept of transference, where the analysand's story comes to the analyst in incomplete parts – lacking significant details that the analyst must infer or draw out in order for the illness to be cured. Brooks sees a similar exchange between narrator and audience. He writes, "we may conceive of the text as an as-if medium, fictional (as any set of signs must be) yet speaking of the investments of desire on the part of both addresser and addressee, author and reader, a place of rhetorical exchange or transaction" (Brooks 234). In this narrative exchange, the audience picks up the incomplete world of the story, and we "intervene" by interpreting it through the lens of our real world. This is the act of creatigation, as the audience does much more than receive information, answer questions, and move on. The audience instead develops

a creative competency to imagine crucial details that will help them navigate the narrative.

Jesper Juul, in *Half-Real: Video Games Between Real Rules and Fictional Worlds*, addresses the notion of incomplete worlds and their pull on readers. “In most cases, the incompleteness of a fictional world leaves the user with a number of choices in the imagining of the world” (Juul 123). This process of imagining is the transference Brooks identified in narrative exchange. When audiences find that there is something missing from the story, they engage in creatigation; they naturally work to fill in the blanks. This is not far from the work readers, writers, and fans do with fan fiction.

Narrative structure is, of course, much more than simply “this happened, and then that happened, and finally that happened.” Instead, a full story contains the plot of things that happened, as well as things that perhaps were expected to happen and then didn’t, or things that a character might have said but didn’t. This deliberate leaving out of details contributes to an incomplete world in different ways, as the audience has to fill in the blanks or read between the lines in order to fully understand the message. In composition and literature classes, this process is known as inference. In science courses, this may illustrate much of the scientific process of testing a hypothesis.

In *Story Genius*, author Lisa Cron examines the way our minds react to stories, and what makes us engage with them. Throughout her work, she refers to the “third rail,” demonstrating that plot is the direction in which the story is moving, but the third rail represents the energizing force for everything. It is the character’s motivation. In fact, this third rail is many times the things the character does and doesn’t do, the things the character says and doesn’t say, and it is this that readers truly find compelling (Cron).

While students playing through a visual novel (VN) would be, in a sense, making plot decisions in their game choices, the goal is for careful narrative game design to encourage making these choices in response to what the students think *they themselves* should do in those situations.

In education, the question becomes whether educators currently seek this type of exchange in our lessons. Are we asking students to pay attention because we expect them to intervene and participate in a discourse that will fill in the blanks of the third rail in a narrative – and, by proxy, their understanding of the actual world? Or are we asking them to pay attention because this happened first, and that happened second, and all of this will be on the test?

Taking a close look at the narrative structure of school lends a valuable insight into the truth of our pedagogies – and why they often fail to reach that holy grail of "engagement" so many educators seek.

What is Engagement?

"…high school is just a game. You've got to play to win," begins a light-hearted blog on insego.com, in which the author uses game strategy as a metaphor for getting through school. Though it's meant to be a figurative comparison, this statement is not altogether untrue. School shares the general characteristics we recognize as being necessary in games, such as goal-oriented tasks, rules, and outcomes measured in wins and losses. In fact, school had these characteristics before teachers gave out digital

badges for solving algebra equations or assigned *Angry Birds* clones for reviewing vocabulary. Therefore, it is not unfair to posit that school is, in fact, a game. It's just not often an engaging one.

Over the course of many years, working in education in a variety of capacities, I have had the privilege to observe pain points in both students and teachers regarding engagement at all levels, from child to adult.

A Gallup poll conducted in the fall of 2015 surveyed students about their perception of school and their ability to succeed. The survey looked into four different areas of interest, including career/financial literacy and entrepreneurial aspiration. The other half of the survey examined students' feelings in two sections: hope and engagement, and the results in these areas are particularly telling about what engagement means *to students*. The poll document itself defines engagement as "The involvement in and enthusiasm for school" (Gallup). The engagement question for which students gave the lowest score was "I have fun at school." Within the hope section, the lowest score went to "I have a mentor who encourages my development."

According to edweek.org, the study "found that only half of adolescents report feeling engaged in school, and a fifth are actively disengaged. About 10 percent of students are classified as both disengaged and discouraged." Gallup's findings reflect Beymer's observation that student intrinsic motivation declines over time, just as schools tighten their control over the maturing students and lessen student autonomy. Together, the data suggest that reduced autonomy as students get older may result in reduced enthusiasm and engagement.

This striking information indicates a serious problem – but what, exactly, is the engagement students seek?

Florida educator Michelle Lux has taught grades 6-12 for over 21 years. She has a specific interest in online education, as this is where much of her most recent experience has been. Her view of engagement is that it can be measured in a several ways, including whether the student voluntarily spends extra time researching the material. “In online education, working ahead of pace can be a form of engagement, as this means spending extra time in the course” (Lux). Unfortunately, studies indicate that this extra time spent in class tends to diminish as students age.

“The report suggests that engagement drops as students age because older students feel less cared for by adults and see less value in their own work” (Brenneman). Conversely, students who felt high levels of hope were more likely to succeed in school. It appears that, without a class leader who encourages students and allows them to have fun with their lessons, the academic future of those students is at risk. Practiced transference and encouragement to intervene with class material may be strong tools for achieving engagement.

In fact, it is not only literary assignments in English courses that must utilize a narrative version of Freud’s transference in order to accomplish deeper learning. All subject areas, from algebra to driver’s education, require that students receive information – but their pedagogies don’t necessarily require creative thinking and discourse. There is a story being told to students in their school environment, but instead of providing a narrative structure that keeps them interested, curriculum is often passive and disengaged. Even when educators include games in classrooms, these games often

lack stories, themselves, and they do not require intervention from the student to creatively navigate; instead, the student clicks until he or she achieves the necessary score and can move on. Whether we actively structure our narratives – both in games and in the classroom as a whole – so that those students intervene with the material through creatigation is crucial to their success.

Lux described her preference for using stories in her teaching. "I think stories help provide a reference and a way to remember the concept being addressed" (Lux). One might expect this argument from an English teacher or a creative writing teacher, but Lux's areas of expertise are physics and chemistry. "Most students do not know what a vector is, but they do know how to get to Taco Bell during the lunch break. A story can show them they are using vectors (aka directions) to get from point A to B" (Lux). The question when we are designing curriculum becomes whether we are actively designing stories that increase engagement and encourage the use of necessary creatigation skills.

As mentioned above, one common response to the lack of engagement in classrooms is to include video games in the curriculum. It is important to analyze this movement for several reasons. Primarily, schools are increasingly interested in "gamification" of their lessons, pulling from observations that students are much more engaged in video games than their studies. Also, as Brian Richardson explores anti-mimetic authors in his interrogation of the meaning of narrative, he finds it is impossible to ignore the role and allure of second-person experiences. These are often found in the player's control of a character in a game.

Juul takes his analysis of narrative and applies it to games, identifying a difference between "incomplete worlds" and "incoherent worlds." Games, he says, may utilize one

or the other – or even both, at times. Using the example of *Donkey Kong*, Juul points out that a player can easily imagine and navigate through an incomplete, fictional world in which a gorilla has kidnapped Mario's girlfriend. However, this incomplete world does not provide any hint of explanation for why Mario has three lives and can resurrect after being killed. In fact, all signs in *Donkey Kong* point to death being just as serious for these characters as it is in the real world. If the gorilla were to kill Mario's girlfriend, we assume she would not be able to come back. This is what Juul refers to as an incoherent world. There is no explanation within the story that makes any coherent sense, and, therefore, players fall back on "appealing *to the rules of the game:* With only one life, the game would be too hard" (Juul 130). Juul's interrogation of games and game mechanics goes deeper into this tricky problem, and he makes special note of games that manage to include their mechanics within the story.

This is an important distinction that can also apply to the structure of school. There are core narrative components in lessons, and these are carefully examined by committees and governments with the clearly stated goal of preparing students for college and career. And then there are school-specific rules that students must follow, often without truly adhering to anything coherent in college and careers, for which we are presumably preparing them. There is occasionally a disconnect between the narrative game of school and the mechanics required to succeed.

But how can this disconnect inform levels of engagement? Game designer Nicole Lazzaro of XEODesign, Inc., studied gamers' emotions across a variety of game genres and identified what she calls the four keys to fun in her whitepaper, "Why We Play Games: Four Keys to More Emotion Without Story." This continually updated study

seeks to evaluate how games can increase emotional reactions beyond the basic level of the stories that already exist. In other words, she looked closely at how the mechanics of a game contributes to the appreciation of the overall experience and, when there is one, its story. Her findings show that gamers enjoy what she calls Hard Fun, Easy Fun, People Fun, and Serious Fun. According to her research, games that incorporate at least three of these keys are engaging and tend to be market successes.

Let's take a look at how Lazzaro's keys to fun might be used in an educational visual novel (VN):

"Hard Fun creates emotion by structuring experience towards the pursuit of a goal" (Lazzaro 3). This kind of fun specifically "inspires creativity in the development and application of strategies," and offers "compelling challenges with a choice of strategies" (Lazzaro 3). One of the benefits of a VN is that players tend to review the material closely, trying to achieve all possible endings. The more complex the material, the more challenging this becomes, and players develop strategies to find the best path through the story in order to find all ending points. This is part of the gameplay, but it is also, of course, exactly the kind of sustained analysis that teachers try to encourage in the classroom on a regular basis.

Continuing with the importance of sustained analysis, we can move to the next key to fun. "Easy Fun maintains focus with player attention rather than a winning condition" (Lazzaro 4). In this key, she finds that "Ambiguity, incompleteness, and detail combine to create a living world," and players feel enticed to "linger, not necessarily in a 3D world but to become immersed in the experience" (Lazzaro 4). This meditative sense of lingering interest in material may at first seem misnamed as "Easy Fun," when many of

the games Lazzaro listed as prime examples (*Myst*, *Civilization*, *Halo*) are decidedly not easy. However, these are examples of games that excel in more than one key, and these titles (as well as many VN titles) rely heavily on story and the player's ability to take his or her time exploring the story. This is what "awakens in the player a sense of curiosity" and "entices the player to consider options and find out more" (Lazzaro 4).

For the last two keys, Lazzaro has updated her findings since the publication of her original whitepaper.

For People Fun, the XeoDesign 4Keys2Fun infographic points out that "Everyone wants to spend more time with their friends" (4Keys2Fun). This is the key that focuses on social bonds and working together as a team, which is a common classroom activity. Can VNs be social? This may be the trickiest area for VNs to incorporate Lazzaro's keys, as VNs are generally meant to be solitary games, much as books are meant to be read alone. However, the creation of VNs as a classroom activity is an option, or the creation of additional branches to an existing VN template, and this can be done as a group. I'm reminded of the classroom thought exercise I experienced in my teens, when we worked together to identify what Romeo might have done differently.

"Serious Fun is play as therapy," the infographic declares of the fourth key. "Purposeful play changes how players think, feel, behave, or make a difference in the real world" (4Keys2Fun). This is a clear and easy connection to school, as engagement levels increase when academic choices and activities are meaningful. For a VN to have meaning in the real world, it will be important to connect VN play with instruction that prepares students to actively develop their creatigational skills as they consider real life connections to the story. In fact, a VN could be a strong platform for testing project-

based learning activities ahead of time in the classroom, especially those that encourage students to solve real-world problems.

With these observations in mind, there is no reason that careful game design for education could not incorporate all four keys to fun. In fact, it absolutely should.

Actually, though, defining what a game truly is has been for decades – and remains to this day – a subject of some debate. One broad but helpful statement by Bernard Suits in "What Is a Game?" finds that "to play a game is to engage in activity directed toward bringing about a specific state of affairs," (my example: attending lessons or doing homework in order to achieve some grade or degree) "using only means permitted by specific rules," (no books or notes may be used on the this exam, or this lab must be completed with one other classmate within two hours) "where the means permitted by the rules are more limited in scope than they would be in the absence of the rules, and where the sole reason for accepting such limitation is to make possible such activity" (Suits 156) (without grades and restrictions such as "no books or notes," the experience of school becomes significantly different and perhaps less of a clear challenge). It's important to note that Suits never declares in his definition that an activity must be enjoyable or entertaining to count as a game.

As a complement to Lazzaro's four keys to fun, it is useful to consider software engineer Andre Malan's outline of the five ways in which school is a game:

- Schools reward students with grades for completing tasks.
    - Games reward players with levels, badges, and items for achieving goals.
- Students take final exams to demonstrate their understanding of a subject.
    - Players battle bosses to demonstrate their ability to use new skills.

- Students explore extracurricular opportunities to develop new skills.
    - Players take on optional side quests to learn new things.
- Students must meet various prerequisites to take and complete courses.
    - Players must meet various prerequisites to reach and complete missions.
- Students earn special status recognition upon the completion of their education.
    - Players earn special achievements to prove they have completed their game.

When presented in this way, it may be perplexing that students often aren't engaged in school. Why do gamers spend countless hours with controllers in their hands, while students count the seconds before they can close their books?

In "Creative Engagement in Schooling," Eric Booth explains that "Learning can be transformed into understanding only with intrinsic motivation. The learner must make an internal shift, must choose to invest herself, to truly learn and understand. The intrinsic motivation required for creative accomplishment in artistic media applies to creative engagement in all media, including STEM subjects" (Booth). Comparing this observation with the results of Beymer and Thomson's study, Booth appears to be missing the critical component of extrinsic motivation, which is crucial to the development of creatigational skills. The value of intrinsic motivation is absolutely valid, though it must be scaffolded, guided, and prepared carefully with attention to the nuanced needs of the learner who requires both autonomy and instruction for engagement.

Thus, creative engagement requires more than reading, listening, and memorizing information; it means the learner must be engaged in guided choice during the analysis of

artistic endeavors, creatively navigating and learning through experience what is required to develop an idea and solve a complex problem.

But are games for gaming's sake the answer to building these imaginative, creatively engaged competencies? As Dr. Douglas Clark of Vanderbilt University points out, this emphasis on gaming is unhelpful because it shifts a focus onto creating any games within budget, and it distracts from the true goal of engaging learners. The 2016 National Education Technology Plan appears to observe this important distinction, as well. While gamified pedagogies receive significantly positive attention in the plan, there is also a strong effort to encourage educators to embrace personalized learning, where students experience agency in pursuing their own education and developing lifelong habits of learning. Rather than simply presenting students with games, the NETP recommends presenting students with *choices*.

The Impact of Choice

We expect students to go beyond the simple pleasure of reading a book; they are asked to engage in exploration by finding the author's purpose, identifying clues in foreshadowing, analyzing elements of cause and effect, and more. In addition, we often ask students to become involved in analysis of the creation of these works. For a reader

who is already well-versed in the methods of critical thinking, a simple read-through and discussion might suffice to gather the larger message of a complex text. But educators are aiming to teach new skills – including essential creatigational skills – to students who will struggle with them at first. These learners will require more engagement and personalized experiences to make the lessons stick.

This is exactly what visual novels, a *Choose Your Own Adventure*-esque genre of games that pulls heavily from graphic novels, seek to do, but they bring readers into a game where the ending is a mystery, and players must go on a journey of interrogating details and choices to visualize multiple outcomes. Though these games are quite popular among their fans, and though they embrace literary, audio, and visual art within the world of coding and digital communication, they have yet to be tapped as reliable, mainstream educational resources.

This may be part of the reason that, though school is technically structured as a game, the user experience often lacks essential elements that would make the experience engaging. Malan follows up his comparison of games and school by asking "why is school a crappy game?" and he gives four answers. Each one may hold a new key to successful classroom/game design.

- Students who fail find themselves in serious trouble.
    - Gamers who fail can try again.
        - This is an important distinction. There is rarely a branching opportunity available that allows for further progression and success for students who do poorly, as there generally is for gamers who misstep. Instead, the "replay" of certain school

events holds a social and often financial penalty, as well as the penalty of lost time. Rather than present students with a losing scenario, the 2016 NETP recommends using assessment technology that is adaptive and can leverage algorithms to identify student skill in real time and adapt quiz or exam questions to both meet the student's skill level and encourage students to improve. This is a change that may help personalize learning experiences further.

- Extracurricular activities can distract from the main purpose of school.
    - Side quests in games only enhance the fictional world and build on the curiosity that powers exploration.
        - With the established necessity for creatively engaged competencies, this fact is troubling. The NETP recommends enhancing technology with regular opportunities for engagement and study, personalizing the student experience and moving it beyond the traditional curriculum environment. This balance that students will subsequently have to find between work and life is another part of the essential creatively engaged competencies that focused, extra-curricular activities can teach.
- In school, students aim for 100% and miss the mark if they don't do everything perfectly.

    - In games, players gain experience points, levels, badges, and other positive reinforcement for their efforts, and they can track their progress clearly.
        - Because of this problematic situation, students are not rewarded for their efforts so much as they are punished for failing to achieve a perfect score. This is not typical of game experiences, which observe player progress and reward them at regular intervals for even minor successes, thus encouraging them to try harder next time.
- School does not have a good story.
    - Games offer experiences that are all linked to an overall narrative experience for the player, and the outcome is rewarding.
        - Malan writes, "You are one of thousands of students with nothing special about you. Complete this numbers of classes, some of them requiring other classes. In each class, your mission is to go to class, hand in the assignments and pass the exam. When you're done, you get your certificate." With personalized learning initiatives, students will find branching opportunities similar to those presented in successful games, and they will develop their own academic stories as they progress through school.

Much of what Malan describes about school has the dangerous potential to fall significantly short of sparking creative thinking and innovative engagement in

students, whose primary focus has become STEM, due in part to a major push from the federal administration. In 2010, President Obama helped create a non-profit called Change the Equation, which lists first in its mission statement that they are "elevating STEM literacy by advocating evidence-based state policies and practices that are known to produce STEM-literate high school graduates" (Change the Equation). However, initiatives that favor STEM-literacy, which can be creative but does not highlight creative work as a priority, over STEAM-literacy or more obviously creative engagement, may be missing out on valuable opportunities to convey the importance of imagination and critical thinking, as well as other creatively engaged competencies.

And yet, in efforts to design courses with STEM-based games that are expected to be engaging simply because they contain gamified elements, students and teachers become part of a growing social trend that may actually be moving away from creative exploration and therefore away from creative problem solving and the kind of innovative thinking that is an integral part of being college and career ready in most fields. Again, games for gaming's sake are not the simple answer that will make school engaging; educational games must involve students in relevant, choice-based activities that develop their creative thinking abilities and reasoning skills.

Because of their design structure that engages players on multiple levels, VNs may be helpful in this area. These comic book/novel/video game hybrids can be used to present students with important new ways to analyze a variety of topics they will study in school. For example, teachers have long observed the importance of visual aids in analyzing literature. In an article for *The Council Chronicle*, elementary school teacher Rachel Sawyer Perkins explained her use of graphic novels in the classroom.

"Using a comic, the students were able to understand that each panel represented a paragraph. The narrative text at the top became the topic sentence of sorts, communicating the main idea of the paragraph. The details were found in the visuals and in the dialogue" (NCTE). VNs can take this even further, prompting students to analyze cause and effect in the texts they read. And, because VNs function as games, they encourage engagement, choice, and exploration beyond passive reading. If the objective is to increase engagement, develop creatigational skills, and improve the overall story of school, VNs might be a step in the right direction.

In *How to Raise a Child with a High EQ*, Lawrence E. Shapiro notes the importance of both creative imagery and game play in the development of the brain and necessary life skills: "Through games, we can give children the opportunities to learn and practice new ways to think and feel and act, and by participating in these games, we can become an integral part in the emotional learning process" (Shapiro xv). For these reasons and many more, an emphasis on imaginative creation and narrative choice in engaging schoolwork becomes a clear necessity in training students to function as healthy adults.

Of course, games have long been the focus of study around their potential for making schoolwork engaging. In "U.S. Department of Education: The Future of Education Includes Video Games," Erik Martin of the U.S. Department of Education is quoted saying that "Video games can really provide formative, quality assessment about how a kid tackles a problem and how they fail and overcome the challenges around a certain context a game provides them" (Crecente). Of course, it is imperative that educators not fall into the easy way of thinking that any game is sufficient to meet

this need. Not all games present students with mysteries to solve or spark ideas that encourage them to take action in their own learning experiences.

This is where the largely untapped – for educational purposes – hybrid of narrative storytelling and game mechanics may provide a crucial insight into deepening classroom engagement. By using VNs and the structures and tropes that work for them, can educators increase engagement, inspire lifelong learning, and foster creatigational skills?

As Kurt Squire explains in *Video Games and Learning*, "Games differ from simulations in that they give roles, goals, and agency; elicit fantasies (including transgressive play); and design experiences to manage complexity and learning" (Squire 29). These goals and agency, when they make up the core elements of games that connect students to a larger story, are part of the journey of uncovering a mystery, and they may be the key to transforming important texts to digital platforms for learning.

Dr. Loretta Jackson-Hayes, in her article for the *Washington Post*, writes "To innovate is to introduce change. While STEM workers can certainly drive innovation through science alone, imagine how much more innovative students and employees could be if the pool of knowledge from which they draw is wider and deeper. That occurs as the result of a liberal arts education" (Jackson-Hayes). There are ways to encourage creative thinking in our students as we get them ready for college and careers. However, we as educators must remain creative in our own thinking, and we must explore innovative technologies and possibilities for allowing education to transform as it moves to new platforms – rather than simply shifting what we can to

gamified software that ignores the importance of choice and narrative in the educational experience.

The development of engaging narrative exploration can also be seen as a starting point for further engagement across all subject matters, as educators aim to make school in general a better game with a better storyline.

"In the end, video game companies have spent billions in money and in man-hours in order to find ways of keeping people engaged in highly repetitive tasks. I think educators should be looking at how they can rework some of the success that game developers have had into the classroom" (Malan). Because VNs are interactive examples of storytelling in digital formats, they are uniquely well suited for education. The 2016 National Education Technology Plan calls for educators to move away from printed text books in an effort to explore more options that are available in digital formats. To clarify, I find no argument with printed text whatsoever, and this study does not seek to demonstrate that reading print is somehow lesser than reading on a screen. However, digital texts in classroom environments are becoming more and more ubiquitous, and it is prudent to examine ways to move toward the best possible outcomes for students. This shift is, in part, to prepare students for regular use of technology – an important skill for college and career readiness – but the push for digital texts also aims to encourage engagement with educational materials on second screens – which are, for many students, favorite free time devices – outside the classroom.

Visual novels may be useful options to respond to this call for digital texts because they are so versatile. As I will demonstrate, the format of a VN makes it possible

to transform nearly any text into a branching narrative with options that take readers through choices and consequently guide users through critical thinking.

Jesper Juul writes, “The fictional world of a game strongly depends on the real world in order to exist, and the fictional world cues the player into making assumptions about the real world in which the player plays a game” (Juul 168). Juul describes several video games in which players engage, digitally, in simulations of experiences they would recognize in the real world. However, these experiences are significantly limited in their interactions. For example, in *FIFA*, players press few buttons to run down the field and pass the soccer ball. In actuality, there are many ways to perform these movements, but in the fictional world of the game, these movements are restricted. “By removing detail from the source domain, the game focuses on a specific *idea* of what the game is about such as capoeira, soccer, tennis, driving cars. A game does not as much attempt to implement the real world activity as it attempts to implement a specific stylized *concept* of a real-world activity” (Juul 172). In fact, some games choose to create metaphors for movement rather than simulate the movements at all. In *Top Spin*, as Juul describes, the experience of delivering a tennis serve is replaced with a timed, coordinated movement of pressing buttons in the correct order at a precise moment. How does this replace the body movements required to serve a tennis ball? “The basic answer seems to be that both tasks are *difficult:* instead of performing a serve by mimicking the actual tennis activity, the serve has been replaced by another difficult task. The video game activity is a metaphor for the tennis activity” (173). In this way, video games may be able, in the right circumstances, to hold a mirror up to school life, altering it in metaphoric ways to engage students in a storyline that can have a lasting effect.

It's not only creative game design that makes video games so engaging. As it turns out, the visual element may be a strong creatigational guide to players – and to students who play gamified lessons. For struggling readers in particular, classroom texts may prove difficult, as students fail to create mental images while they read. According to research, illustrations can address this problem by promoting "positive attitudes toward reading in general" (Hibbing 762).

Analogue: a Hate Story handles the problem of rules vs. story world, of an incomplete world vs. an incoherent one, right from the beginning – and it does so with visual images to aid the creatigational process of making mental images through reading. One tricky part of VNs is that the player receives options for actions or responses, but those options may not reflect what the player truly wants to do in that situation. To combat this immersion challenge, *Analogue* creator Christine Love used the story world to explain the restrictive choices. At the start of the game, the main character – a computer AI system – tries to get the player to type whatever he or she wants.



Figure 1. Screenshot From *Analogue: a Hate Story.* Screenshot permission: Christine Love

However, in the fictional world, the computer system is damaged, so the AI cannot read what the player has to say.

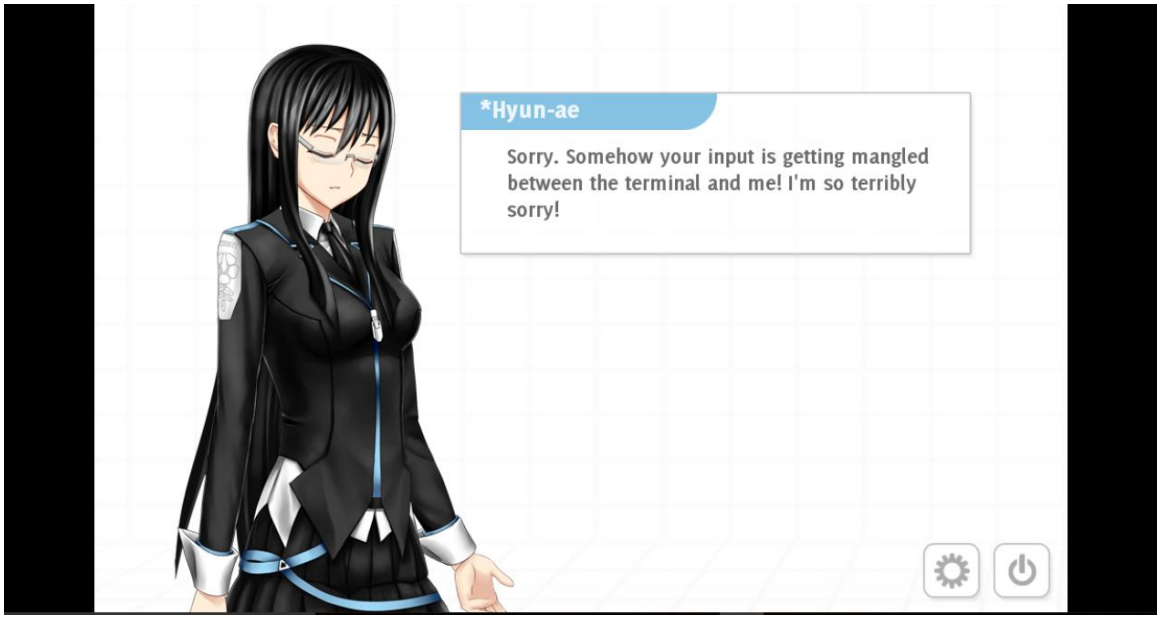


Figure 2. Screenshot From *Analogue: a Hate Story.* Screenshot permission: Christine Love

Therefore, the computer creates binary options for the player to select.

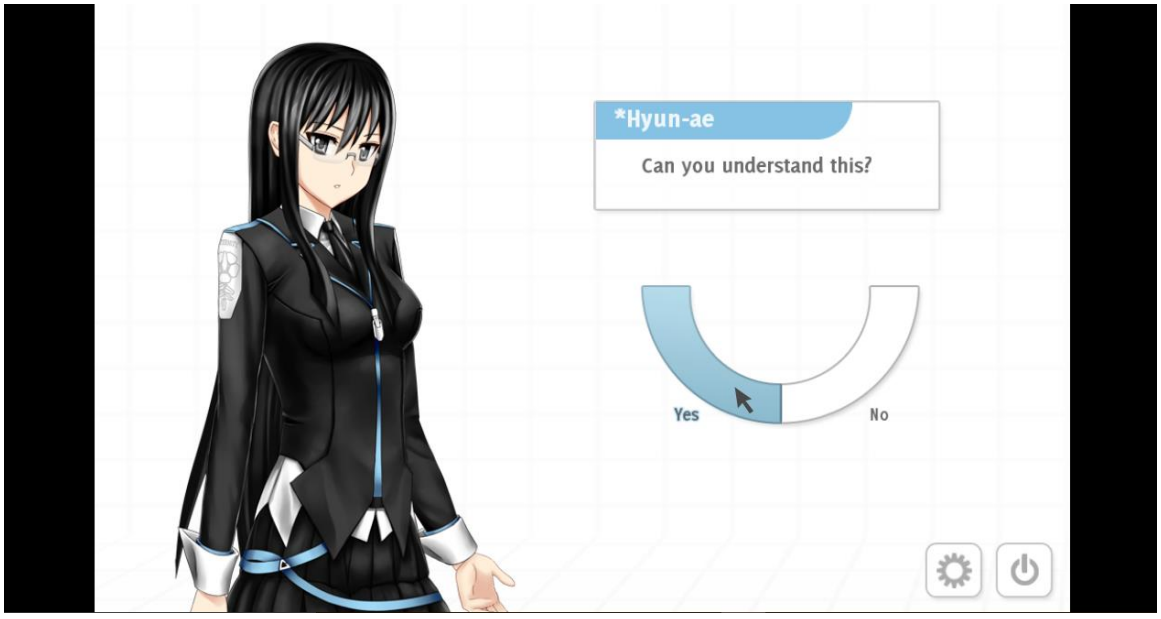


Figure 3. Screenshot From *Analogue: a Hate Story.* Screenshot permission: Christine Love

Because the necessity of this choice system is built into the story of the world, the player remains immersed.

Visual novels often pull upon an internal voice, asking players to immerse themselves in the minds of the characters they are playing, and when options appear, the players view those much as they would potential answers on a BuzzFeed quiz. Which would *you* like to do? This is a simple but often effective way of maintaining the fictional world and asking players to creatively navigate it on their own by making choices.

CHAPTER FIVE: *HAMLET*, THE VN

"Now might I do it" (*Hamlet*).

For my first attempt at designing a visual novel, I considered the implications of my research and aimed to tell a story while engaging students with physical "lean back" play, but "lean forward" creatigation through choice in the narrative. I met with two instructors and together identified several standards that would be used in a typical classroom setting to teach William Shakespeare's *Hamlet*. From there, I selected one pivotal scene in which Hamlet might have made different decisions to alter the outcome of his story. I wrote and created, using the software TyranoBuilder, a VN that starts at this pivotal moment – when Hamlet decides whether to kill Claudius at prayer – and contains four different endings.

In the game, Hamlet's first branching option comes when he looks at the praying Claudius and has to decide between "And now I'll do 't," and "No. That would be scanned." This is a crucial moment in Hamlet's story, when he has to make a serious decision that impacts the rest of the story.

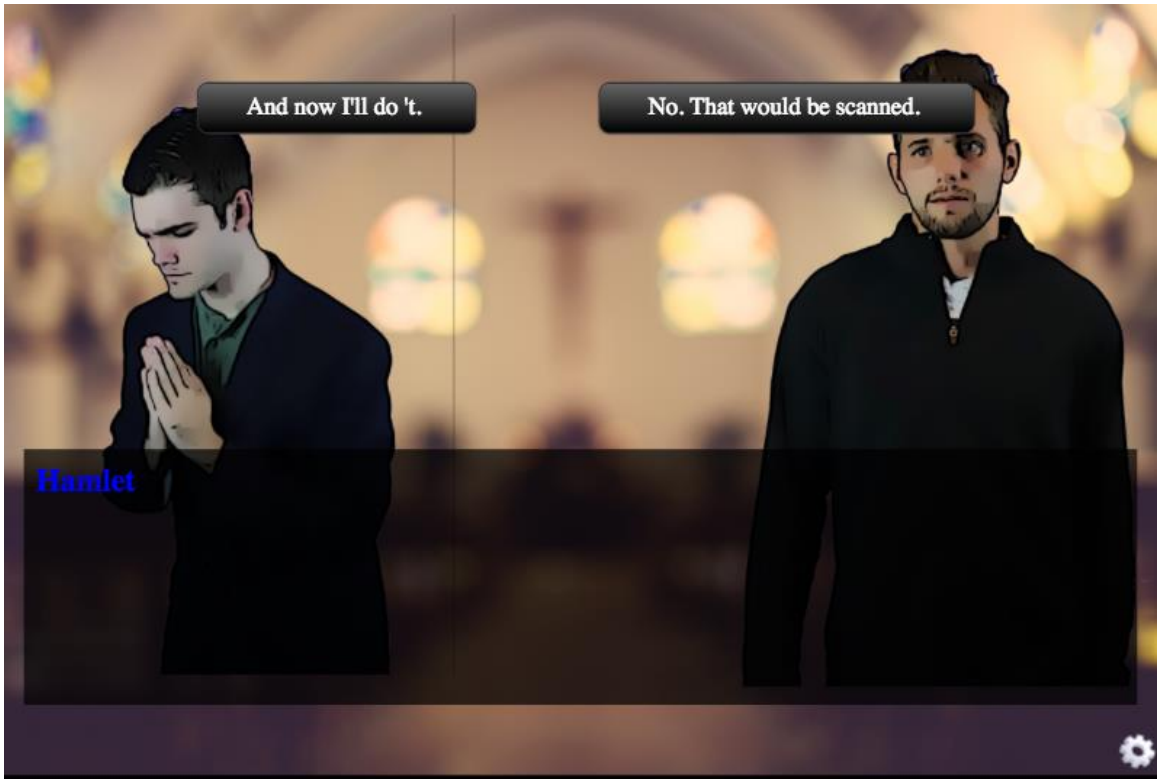


Figure 4. Screenshot From my visual novel version of Hamlet depicting the branching story options

I selected this part for one main reason. The scene that starts my VN presents a clear moment where Hamlet has to make a decision, and that decision makes a difference in the outcome of the story. Not only is this branching moment an integral trope of many VNs, but it also is essential to the "lean forward" analysis that I would like students to engage in as they build creatigational skills. For example, had I selected a moment in the play where Hamlet decided something less pivotal – perhaps whether to be sarcastic or polite to Polonius, – that would have carried less ethical weight than the decision to commit murder. In addition, it would have had less of an impact on the events of the story. For students to engage in the development of creatigational skills, they must experience events of meaningful choice that yield clear results.

To zero in on measurable, classroom-based objectives, I spoke with a middle school instructor who identified two Common Core course standards. Specifically, LAFS.7.RL.1.3, “Analyze how particular elements of a story or drama interact (e.g., how setting shapes the characters or plot)” and LAFS.7.RL.1.2, “Determine a theme or central idea of a text and analyze its development over the course of the text; provide an objective summary of the text.” As teachers create their lessons, they must take care to ensure their instruction adheres to the standards their state and school have adopted. In this case, the teacher I spoke with expressed a need to enhance her instruction around these two standards.

In this case, the requirement is for students to be able to both analyze and summarize. While summary is not usually considered an activity for high-level assessment, it is a good benchmark for basic understanding of a plot. Analysis, on the other hand, does call for high-level comprehension, usually demonstrated in the ability to write about the topic intelligently.

My goal with this VN was to meet both standards, at least for this example scene, by encouraging students to play through the game multiple times. One version announces at the end that students have reached the “True Ending,” which indicates they have played through the story relatively as William Shakespeare wrote it.



Figure 5. Screenshot From my visual novel version of Hamlet depicting the multiple endings

However, students are encouraged to think through the different actions Hamlet might have taken at this difficult point in his life, and they can select options that will show them alternate endings, as well. Teachers should feel comfortable encouraging their students to imagine additional scenarios that the game does not provide. This process of exploration within the story is a form of analysis, and it is meant to stimulate creatigational skills.

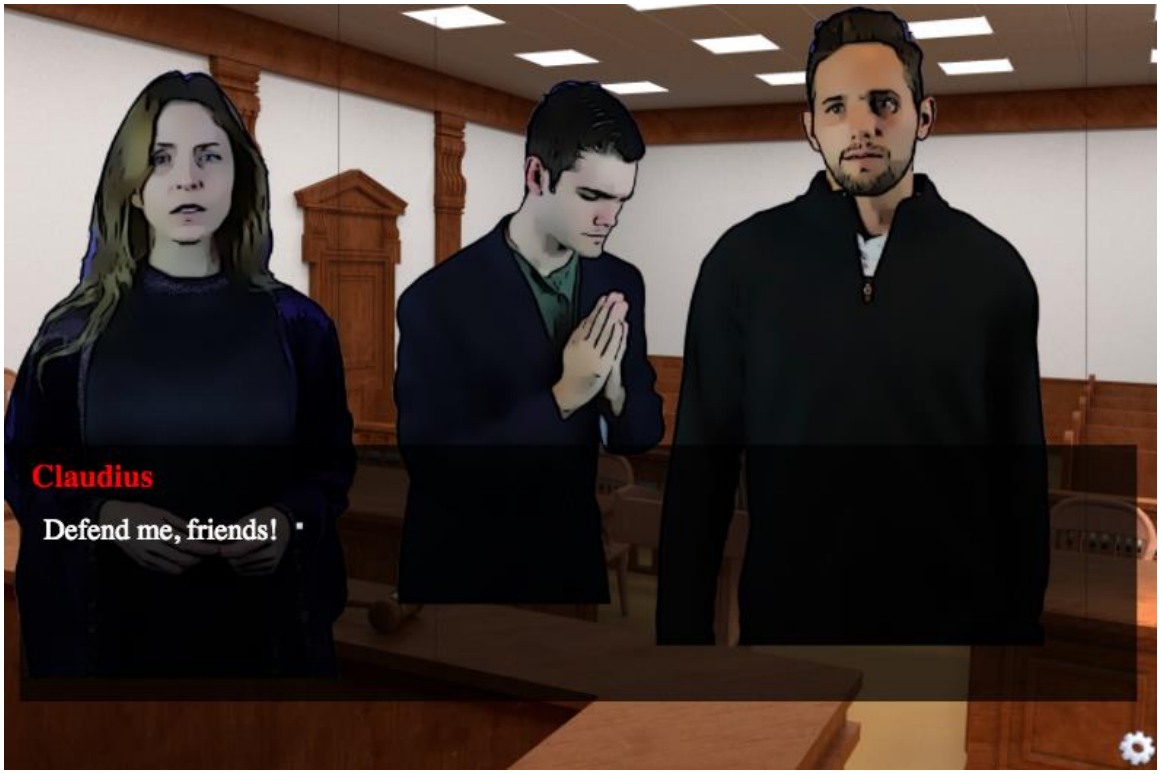


Figure 6. Screen shot from my visual novel version of Hamlet depicting an alternative scene students can choose.

A recommendation for further study is, of course, to test this VN or another like it with students who are already familiar with the basic plot of *Hamlet*. As with most class lessons, I have no illusion that one interactive experience alone could fully meet the standards required. Rather, the point is to enhance students' understanding of the necessary material, guiding them through choices that they feel they have some level expertise to help them understand (from previous class instruction on the play), while encouraging creatigation through a subject with which they may have otherwise struggled.

Future field research with VNs should focus on clear communication with the instructors to determine what the students will and will not understand of the material before they test the game. Surveys prior to the test should consider whether students

enjoy playing video games (and, if so, what kinds), as well as whether students enjoy reading (and, if so, what they enjoy reading). Surveys following the experience should ask students to evaluate whether their understanding of the material has changed, as well as provide feedback about what they felt when they played the VN itself.

My reflections on the pros and cons of the design and development process appear in the conclusion of this text.

A completed alpha version of the game is available in the appendix.

CHAPTER SIX: DRIVER'S EDUCATION VN

"This car can save the world – or destroy it."

It is one thing to create a narrative game for the purpose of teaching material in a language arts classroom; it may be another thing entirely to use this method in a different subject area. To test the limitations, I designed a visual novel outline to teach a driver's education lesson. Again, I focused on "lean forward" creatigation as I developed an incomplete story world and meaningful motivation for the player to practice pre-start activities in driving safety.

I decided to work with vehicle pre-start activities for two reasons. First, there are six commonly accepted actions a driver is expected to perform prior to starting the vehicle: Lock the doors, put the key in the ignition, adjust the seat, adjust the mirrors, adjust the steering wheel, and put the seatbelt on. This simple list gave me a basic framework for the direction of my VN.

Second, the clear movements required for these six steps could make strong use of Elaine Scarry's "stretching, folding, and tilting" in *Dreaming by the Book*. In this text, Scarry examines what makes fiction engaging and memorable, breaking down writing techniques into visual descriptors that excite audiences' imaginations. One of these techniques she calls "stretching, folding, and tilting," and it refers to "picturable forms of motion" (Scarry 115), or step-by-step images. This seems a perfect fit for the six pre-start activities in a story, as they can be shown or described in steps. In addition, Scarry notes that repetition – literally re-reading the story – is what helps

make this technique particularly memorable for the audience. “Even though the moving pictures do not lie stacked ready-made in a picture box in our brains, they can, on subsequent rereading, be recomposed and reanimated more vividly, less exhaustingly, than on our first encounter with them” (Scarry 133). This is an important observation, as the goal in a driver’s education VN is to have students play multiple times to reach all possible endings, and, after multiple playthroughs, feel more confident about the rules of safe driving.

To determine the specific classroom goal for this lesson, I consulted CPALMS, the official Florida course information site. There, I located the current course preview for Driver Education/Traffic Safety – Classroom. Several objectives appear, and I selected one that I felt could adequately address pre-start activities: “Describe basic vehicle control, including exterior and interior promotion checks, control of motion and direction, and basic maneuvers.” It is worth noting here that there are, of course, multiple levels of proficiency one can expect from a student along the way to full mastery. The operative verb in this objective simply asks students to be able to “describe” the basics, which calls for a higher complexity assessment than an objective that uses a different verb, such as “identify,” but a lower complexity than, say, “infer.” In other words, all students must be able to do by the end of this experience is confidently discuss their pre-start activities, demonstrating both memorization and comprehension of the tasks.

For this VN, I chose to provide a clear, written outline rather than a completed game specifically to show two different versions of the VN process: a playable game

with visual and audio elements, as it would appear to students in the *Hamlet* VN, and a scripted, text-only version as a teacher might work on it.

The story of this VN also differs from the one I used in *Hamlet*. First, there was no original source material to import from Shakespeare's writing in this VN. Therefore, the story had to be new. This could be a great opportunity for teachers attempting a VN in their course, or it could present a problem of decision paralysis. I deliberately put myself through these challenges to evaluate the level of work required and examine the practicality of teachers creating their own VNs for classroom use. While *Hamlet* posed its own challenges, the lack of any prepared story opened up an entirely new series of challenges in this driver's education VN.

In addition, for this VN, I attempted to present a less serious story than the one in *Hamlet*. As students need only to understand the pre-start activities enough to describe them later, I created an intentionally ridiculous scenario in which successful completion of the tasks saves the world – and unsuccessful completion destroys it.

Building a VN without significant headache and confusion requires mapping out a flowchart of ideas ahead of time. This flowchart must indicate the various branching options a player will encounter, as well as where those branches will lead. Though many high-budget VNs have enormously complex narrative flowcharts, a simple story can be accomplished with only a few branches. This was my goal, as I wanted to explore what might be possible for the average, non-gamer instructor to design.

This flow chart demonstrates a simplistic script template for a VN with four different endings. I created this flow chart and then adjusted it as necessary when I

designed the scripts for both games in this study

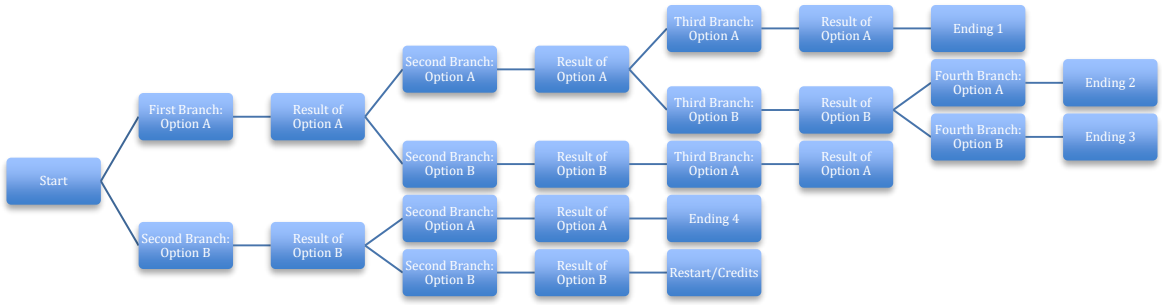


Figure 7. Visual Novel Script Flow Chart

My reflections on the pros and cons of this process appear in the conclusion of this text.

A completed alpha version of the game outline is available in the appendix.

CHAPTER SEVEN: VISUAL NOVELS AND STEAM RESEARCH

"As the competent performer becomes more and more emotionally involved in his tasks, it becomes increasingly difficult to draw back and to adopt the detached rule-following stance of the beginner" (Dreyfus).

With a shift away from arts-based education and arts funding in the United States and a shift toward STEM, rather than STEAM, we may be raising future generations who will lack the requisite skills to solve problems creatively in their daily lives, in their professions, and in emergency situations. This becomes particularly evident in political climates where administrations cite a "failure of imagination" that allowed a terrorist attack, or a President declares he did not realize how complicated health care would be. It is also important for professionals and young adults to develop skills that call upon their imagination, as responses to personal emergencies and stresses at work often require creative thinking.

In addition, with much of education going at least partially online, there is not only a push for STEM-related curriculum, but also lessons that can keep independent learners engaged with technology in front of their monitors or on their mobile devices. For this reason, gamification of education has experienced a surge in popularity. At first, it seems like an obvious solution, as video gamers spend hours riveted in front of screens. However, not all games provide the same level of intellectual stimulation. In addition, not all games are entertaining. In order to successfully gamify education, the games must balance educational content with a "lean forward" intellectual form of engagement. This

engagement must force players to exercise creative decision-making skills, which I call "creatigation," as part of the core game mechanic.

A few already-established genres of gaming rely heavily on pushing players to "lean forward" creatively and intellectually, placing creatigation at the center of the game experience. All of these genres are also known as "story-based" or "narrative" games. Games that receive this description focus more heavily on story and narrative structure than on other mechanics.

For example, a game like *Angry Birds* does contain story elements. It has characters, a back story, and a central conflict. And yet, none of these things follows any narrative structure that is critical to the game mechanics. That is to say, the entire story could be removed, and the game itself would still make sense and be fully playable.

This is not the case in narrative or story-based games. These games, which can be found in several video game genres, place their mechanics within the narrative structure, and thus players are forced to think about the story in order to progress through the game. This is where I pull from Jesper Juul's "lean forward" and "lean back" concepts. He refers to some media that is designed for passive reception. There is no physical activity involved, and there is little mental activity, either. These are "lean back." Most video games require physical activity, and therefore are more "lean forward." And yet, some games do feel more like a book or a film, especially those that are considered narrative games. These become an interesting combination of "lean forward" and "lean back," in that they may allow the player to "lean back" during much of the game, but they are going to "lean forward" mentally and creatively. It is

this activity that may tap into the intellectual stimulation teachers seek, especially in their online students. In addition, the process of story analysis required in certain games may be a strong development tool for students' creatigational skills.

As Hubert L. Dreyfus explained in his paper "Intelligence without representation," it is the immersion in situations that truly teaches the learner how to make decisions and take action later. He uses examples of chess and tennis to show how the process of thinking through various outcomes – and physically practicing the movements of the game – is the process of learning and gaining competency. At first, the learner receives only simple options, but as the learner becomes more advanced, he or she can see more options and make more substantial choices. Narrative games often excel at scaffolding the choice-based, situational learning in their stories.

One genre among these narrative games that may be particularly well suited to developing creatigation is the visual novel (VN). A kind of digital evolution of *Choose Your Own Adventure* novels, the VN has the ability to engage audiences in branching short story or even novel-length texts, complete with graphic novel-style visuals and accompanying soundtrack and sound effects. Audiences play through these stories, making key choices along the way that usually impact the outcome of the plot. This is an excellent exercise in creatigation, and the stories often contain (as stories frequently do) facts about the real world. For example, in one popular VN called *9 Hours 9 Persons 9 Doors*, released on the Nintendo 3DS, players read about, analyzed, and made decisions regarding the history of the Titanic, philosophic interpretations of coincidences, and logical fallacies. None of this was intended for classroom use; the title sold entirely to players who wanted it for entertainment.

For these reasons, I decided to examine VNs and the design process required to make them for a classroom environment. My goal was to evaluate these story-based games for several criteria.

VISUAL NOVEL RUBRIC

I scored my evaluation in a rubric that might be used for student assessment. It's meant to provide an easy-to-read look at the pros and cons of developing VNs for curriculum and using them in the classroom.

The first scoring category is Ease of Design (technology). Here, I evaluated the relative ease a curriculum designer or teacher might have accessing the necessary tools to design a VN.

The second category looks at Ease of Design (story). I found it important to separate technology and story in my evaluation because they pulled from two different skill sets.

The third scoring category is Ease of Visual and Audio Design. This is a major part of VNs that requires some level of production. At the basic level, sprites (characters on the screen), background images, score, and sound effects must be considered for the completion of any VN.

The fourth scoring category examines User Experience. Testing for the alpha version of my *Hamlet* VN is planned for later this year, and the student feedback will complete this rubric score. This section will evaluate, via student and teacher survey,

how players felt during the VN, as well as what they learned, how many endings they voluntarily sought, and what they would have liked to see change.

Table 1. Visual Novel Rubric

	Highly effective (17-25 points)	**Moderately effective (8-16 points)**	**Needs work (0-7 points)**
Ease of Design (technology)	The current technology is intuitive, inexpensive, and uncomplicated for most people, even without any programming experience.	The current technology requires a little work and/or money for most people to get started, though extensive programming experience is not required.	The current technology is too complex, too expensive, or both to be considered reasonable for most educators to bring to the classroom.
Ease of Design (story)	The narrative structure is intuitive enough for most people to write and design engaging	The narrative structure is relatively intuitive, though most people will require some guidance to write	The narrative structure is too complicated for untrained writers and designers to pick it up in a

	Highly effective (17-25 points)	**Moderately effective (8-16 points)**	**Needs work (0-7 points)**
	material with little to no guidance.	and design truly engaging material.	reasonable amount of time.
Ease of Visual and Audio Design	The current availability of free or affordable, engaging, visual and audio production options is enough to satisfy many curriculum needs.	The current availability of free or affordable, engaging, visual and audio production options is almost enough to satisfy many curriculum needs.	The current availability of free or affordable, engaging, visual and audio production options is not enough to satisfy many curriculum needs.
User Experience	Most players reported feeling engaged, voluntarily played through	Some players reported feeling engaged, voluntarily played through all endings, and felt that	Few players reported feeling engaged, voluntarily played through all

	Highly effective (17-25 points)	**Moderately effective (8-16 points)**	**Needs work (0-7 points)**
	all endings, and felt that they learned something about *Hamlet*.	they learned something about *Hamlet*.	endings, and felt that they learned something about *Hamlet*.

At this point, the highest score I could give the study is a 75, as 25 points are reserved for a field test. From the other three categories, I give the study a 40, which is not a passing score. There are some strong areas and some areas that need improvement. I believe with some work, this score can be improved.

For Ease of Design (technology), I gave the study a 17. This is the lowest score in the Highly Effective category. While there is a variety of affordable options for VN creation that don't require programming knowledge, from simple PowerPoint slide shows to VN-specific software programs like TyranoBuilder, the design process required for placing sprites, text, and options in the correct locations, as well as the logic required to make all branches lead to the correct scenes, can be a recipe for confusion. At the very least, it is time consuming. I can see a dedicated curriculum design team or a teacher workshop event being able to handle this with ease, but an overbooked teacher trying to create a VN alone on the weekend would likely grow frustrated.

For Ease of Design (story), I gave the study a 16. This is the highest score in the Moderately Effective category. The ease of design here will likely depend on the designer's level of expertise in writing. It may be possible for schools to create templates that will help struggling writers come up with ideas, know when to offer branching choices, and what topics might be interesting to their students. However, it is most likely that teachers and curriculum designers will need a workshop on VN creation before they feel comfortable working in this medium.

Finally, for Ease of Visual and Audio Design, I gave the study a 7. This is the highest score in the Needs Work category. Because I did not have a good selection of sprites and backgrounds to pull from for my game, I had to enlist the help of several volunteer actors to play the parts in a photo shoot. While this process worked for my VN, it is not practical to expect every teacher to do this. There is a fantastic resource for royalty-free music available online (MacLeod), and I pulled heavily from this, but it did require some formatting of the files to make the music work in the software I was using to build the VN. If schools were to find VNs to be a useful method of gamifying education, it might be prudent to create a shared database of art and music to improve this part of development.

Creating two different educational VNs for this study was illuminating because it clearly demonstrated several pros and cons.

PROS:

It is entirely possible to create educational content within the unique narrative structure of a VN. It feels like a game, and the mechanics require the student not only understand the material, but also develop creatigational skills by considering different

choices along the way. These choices can require high-level analysis or simple memorization. Therefore, the VN can be used as a complement to lessons at any complexity level.

Of course, these statements reflect upon the process, the research, and the results of the VN development. Student feedback from field tests is required to definitively state whether a VN is truly effective.

CONS:

Ease of design and development is varied. My assumption going into this study was that the technology itself would pose the biggest challenge. However, that was not my experience. There are several software options available that are designed to make this part as simple as possible. With some snags, it was time consuming, though not impossible or even difficult to pick up. Instead, it was the writing and the art and music that were most complicated and, in my opinion, currently serve as true blocks in the progress of VNs as a viable educational tool.

WHAT COMES NEXT?

With a promising concept and challenging design process, VNs offer much to help students develop necessary creatigation, but they also offer a lot of headache to the teachers who choose to create them. It is necessary to gather feedback from field tests with VNs to examine a number of results.

It may be beneficial to survey teachers about student comprehension and engagement levels following any field test with choice-based games. It is also

important to test different types of VNs to determine whether a specific subject matter, writing style, art style, or other component has a more positive effect on student engagement and creatigation.

Should schools plan to utilize this method of instruction, a database of art, music, and writing templates is strongly encouraged. It is possible that VNs will remain an option only for school organizations with dedicated gamification teams. For schools without these teams, but that still want to employ game-based learning, I encourage instructional leaders to look closely at all games prior to accepting them for use in the classroom. Before plugging in a game that may seem meaningless to the students, ask the following questions first:

Does this game have an engaging narrative structure at the core of its mechanics?

Does this game include a series of meaningful choices that the instructor can use to guide students in having autonomy over their learning?

Does this game have a story that requires players to "lean forward" intellectually?

Does this game improve the story of the curriculum and of school itself?

Does this game develop creatigational skills?

If any of the answers are "No," then look elsewhere. Students deserve a better storyline.

APPENDIX A: *HAMLET* VN

An alpha version of the *Hamlet* VN can be found at this url:

https://irenelpynn.itch.io/hamlet-visual-novel-alpha?secret=hfFWyqniApZzhyHtmXBkivPVMuA

APPENDIX B: DRIVER'S EDUCATION VN

The following pages contain the outline for a Driver's Education VN:

Title Screen

(Background: A garage with several cars in it. Mysterious music plays.)

Option: **PLAY GAME** (button takes players to scene i)

Option: **CREDITS** (button takes players to game credits – not provided here)

scene i

(Background: A garage with several cars in it. FATE DRIVER appears. He or she smirks. Mysterious music plays.)

FATE DRIVER

Welcome to Driver's Ed. I'm giving you a new car. Does that sound good?

Option: **YES, THANKS!** (continues to scene ii)

Option: **NO. NOT INTERESTED.** (jumps to Total Fail)

Total Fail

(Sound of an explosion. Background fades in: A map of Earth with no continents on it. FATE DRIVER appears. He or she frowns. Sad music plays.)

FATE DRIVER

The entire world has been destroyed because you didn't even try. Wow. Just think of the people out there who depended on you. And you said no. Let's try that again.

Option: **OK, FINE…** (button takes players to scene ii)

scene ii

(Background: A garage with several cars in it. FATE DRIVER smirks. Mysterious music plays.)

FATE DRIVER

Now before you get too excited, let me explain. This car is a *special* car. A *powerful* car. A *dangerous* car. This car can save the world – or destroy it.

(Background fades in: A normal map of the Earth. FATE DRIVER grins. Tense music plays.)

FATE DRIVER

You must accomplish all six of your pre-start activities *before* you leave the driveway. If you do this, you will be following safe driving rules. Congratulations. In exchange, I will promise to let you keep all six major land masses on your planet.

(Background: One by one, the continents begin to vanish. FATE DRIVER's grin is clearly evil. Action music plays.)

FATE DRIVER

That's right! Fail to do any of the six pre-start activities in this special vehicle, and I will destroy a continent.

(The screen shakes. Background fades in: The interior of a car.)

FATE DRIVER

Let's get started… Mwahahahaha.

scene iii

(Background: The interior of a car. Music: Cheesy, uplifting music plays.)

FATE DRIVER

Let's start with something simple.

(Background fades in: A map of Antarctica.)

FATE DRIVER

Antarctica. What happens if you lose that one? Tons of scientific study thrown out the window. Definitely some problems with climate, I'd imagine. But still. You probably haven't been there before. Maybe you don't even care if I take it off the map. Wow. That's pretty heartless of you.

(Background fades in: The interior of a car.)

FATE DRIVER

Want to prove me wrong? Go for it. What's the first pre-start activity of a safe driver?

Option: **START THE ENGINE** (jumps to Antarctica Gone)

Option: **LOCK THE DOORS** (continues to scene iv)

Antarctica Gone

(Sound of an explosion. Background fades in: A map of Earth with no Antarctica on it. FATE DRIVER appears. He or she smiles. Menacing music plays.)

FATE DRIVER

I knew you didn't care about Antarctica. Fine with me. It's mine, now. You were supposed to lock the doors first. Think about it. If you don't lock the doors, any old alien from another world could show up and start playing a game with you where the fate of your planet suddenly rests in your… ahem. Let's play for South America next. We'll see how much you care about that continent.

Option: **READY…** (button takes players to scene iv alt – alt versions are not written out here; they are merely copies of the normal scenes, keeping track of which continents the player has lost.)

scene iv

(Background: The interior of a car. Music: Cheesy, uplifting music plays. FATE DRIVER's hand appears and clicks the lock of the car door.)

FATE DRIVER

Nicely done. I guess you get to keep Antarctica. Whatever. I'd rather have…

(Background fades in: A map of South America.)

FATE DRIVER

South America. I've always been interested in that one. The history. The culture. The food. The music. When you mess up and get this one wrong, this continent is going to be an amazing addition to our – anyway. Let's get to it. What's the next pre-activity after locking the doors?

Option: **PUMP THE BRAKES** (jumps to South America Gone)

Option: **PUT THE KEY IN THE IGNITION** (continues to scene v)

South America Gone

(Sound of an explosion. Background fades in: A map of Earth with no South America on it. FATE DRIVER appears. He or she smiles. Menacing music plays.)

FATE DRIVER

Yikes. That's pretty creepy to look at. What has you just lost? Whatever. Your planet's loss. My planet's gain. Anyway, the next step is to put the keys in the ignition. Really, if you don't, you're likely to drop them and lose them between the seats or something, and that's a huge mistake. Not as huge as literally giving South America away to an alien, but, you know. Still pretty annoying. I wonder what I'll get next. Let's play for… Europe. Whaddya say?

Option: **WHAT ARE YOU EVEN DOING WITH THESE PLACES?** (button takes players to scene v alt – alt versions are not written out here; they are merely copies of the normal scenes, keeping track of which continents the player has lost.)

scene v

(Background: The interior of a car. Music: Cheesy, uplifting music plays. FATE DRIVER's hand appears and puts the key into the ignition.)

FATE DRIVER

Pretty good job. Fine. You can keep South America. Instead, I'll take…

(Background fades in: A map of Europe.)

FATE DRIVER

Europe! Tons of countries throughout this one. It's practically bursting with culture. Can I have the surrounding island nations, too? Well, we'll sort that out once you get this one wrong. Ready? What's the next pre-activity after putting the key in the ignition?

Option: **TURN THE KEY** (jumps to Europe Gone)

Option: **ADJUST THE SEAT** (continues to scene vi)

Europe Gone

(Sound of an explosion. Background fades in: A map of Earth with no Europe on it. FATE DRIVER appears. He or she smiles. Menacing music plays.)

FATE DRIVER

I seriously can't even imagine what people on Earth must think of this. Oh, well. Not my problem. Yeah, so, you're supposed to adjust the seat next. Like slide it into a comfortable position so you can drive safely and see everything. Keep this up, though, and you won't have any land masses to drive on, so it won't matter! Ready to play for Africa?

Option: **WHY DO YOU CARE WHETHER I CAN DRIVE?** (button takes players to scene vi alt – alt versions are not written out here; they are merely copies of the normal scenes, keeping track of which continents the player has lost.)

scene vi

(Background: The interior of a car. Music: Cheesy, uplifting music plays. The screen zooms in and out until it settles in one place, as if the seat has moved.)

FATE DRIVER

Okay, so you saved Europe. Big deal. How about…

(Background fades in: A map of Africa.)

FATE DRIVER

Africa. Now *this* is a continent I'm going to enjoy. The land. The people. The animals. The origin of everything. Yeah, I'm definitely taking this one. Want to stop me? Good luck. What's the next pre-activity after adjusting the seat?

Option: **PRESS THE GAS** (jumps to Africa Gone)

Option: **ADJUST THE MIRRORS** (continues to scene vii)

Africa Gone

(Sound of an explosion. Background fades in: A map of Earth with no Africa on it. FATE DRIVER appears. He or she smiles. Menacing music plays.)

FATE DRIVER

It's all mine. All mine!!! Just FYI, you're supposed to adjust the mirrors. Once you have your seat where it feels right, that's when you check to see whether you can see out of your mirrors. ALL mirrors, btw. You need to be able to see when you drive, obviously. Anyway, want to give me Asia next?

Option: **YOU NEED TO STOP DOING THIS!** (button takes players to scene vii alt – alt versions are not written out here; they are merely copies of the normal scenes, keeping track of which continents the player has lost.)

scene vii

(Background: The interior of a car. Music: Cheesy, uplifting music plays. FATE DRIVER's hand appears and moves each mirror.)

FATE DRIVER

Fine, then. Keep Africa. I'll just take…

(Background fades in: A map of Asia.)

FATE DRIVER

Asia! Look how huge this one is! I almost feel guilty taking it from you to put on my own planet… nope. No guilt at all, here, actually. Let's get to it. What's the next pre-activity after adjusting the mirrors?

Option: **PUT THE CAR IN REVERSE** (jumps to Asia Gone)

Option: **ADJUST THE STEERING WHEEL** (continues to scene viii)

Asia Gone

(Sound of an explosion. Background fades in: A map of Earth with no Asia on it. FATE DRIVER appears. He or she smiles. Menacing music plays.)

FATE DRIVER

Wow. This is going to be the perfect land for plotting our universe domination – never mind that. Focus on your driving! After you've adjusted the mirrors, it's time to check the steering wheel. They can be moved to make it easier to reach them, and that's pretty important. Don't forget! Okay. One more continent on my list… This one is gonna be mine.

Option: **NO WAY I'M LETTING YOU!** (button takes players to scene viii alt – alt versions are not written out here; they are merely copies of the normal scenes, keeping track of which continents the player has lost.)

scene viii

(Background: The interior of a car. Music: Cheesy, uplifting music plays. FATE DRIVER's hand appears and moves the steering wheel.)

FATE DRIVER

Oh, whatever. You're such a do-gooder. So Asia is safe. I think I'll take…

(Background fades in: A map of North America.)

FATE DRIVER

North America. What's that? You don't want me to take away North America? Too bad! There's only one way to stop me. What's the final pre-activity for safety in your vehicle?

Option: **LOOK BEHIND WHILE REVERSING** (jumps to North America Gone)

Option: **PUT ON THE SEATBELT** (continues to scene ix)

North America Gone

(Sound of an explosion. Background fades in: A map of Earth with no North America on it. FATE DRIVER appears. He or she smiles. Menacing music plays.)

FATE DRIVER

Mwahahahahaha! Say goodbye to North America! You can't forget to put on your seatbelt! That's about as disastrous as it gets. Almost as disastrous as me taking North America into space on my – you know, this is none of your business, anyway. But I have some news for you. My people have a rule that there are always second chances. If you'd like to try to rescue your planet, I am honor-bound to let you try. I'll give you the exact same scenarios and pretend we haven't already done this before, so you don't feel awkward. Okay? What do you say? Want to save your planet?

Option: **PLAY AGAIN** (button takes players to scene i)

Option: **CREDITS** (button takes players to game credits – not provided here)

scene ix

(Background: The interior of a car. Music: Cheesy, uplifting music plays. FATE DRIVER's hand appears and pulls the seatbelt over.)

FATE DRIVER

Well, that's pretty good. But, you know… How about we do it again? My people have a rule that there are always second chances. It would only be fair if you let me have another try. I'll give you the exact same scenarios and pretend we haven't already done this before, so you don't feel awkward. Okay? What do you say? Want to save your planet?

Option: **PLAY AGAIN** (button takes players to scene i)

Option: **CREDITS** (button takes players to game credits – not provided here)

LIST OF REFERENCES

4Keys2Fun. Infographic. XEODesign, Inc. Web. 10 Oct. 2017. <http://www.xeodesign.com/assets/images/4k2f.jpg>

9 Hours 9 Persons 9 Doors. Computer software. Aksys Games. Web.

"A Brief History Of Video Games In Education." *TeachThough*t, 12 Sept. 2012. Web. <http://www.teachthought.com/uncategorized/a-brief-history-of-video-games-in-education/>

Adams, Caralee J. "'Soft Skills' Pushed as Part of College Readiness." *Education Week*. Editorial Projects in Education, 9 May 2016. Web. 9 June 2017.

"Amount of Florida Students Attending Online School Doubles." My Fox Orlando. Web. 3 May 2017.

Animal Crossing. Redmond, WA: Nintendo of America, 2008. Computer software.

Belsky, Scott. *Making Ideas Happen*. New York: Portfolio/Penguin, 2012.

Beymer, Patrick N. and Thomson, Margareta Maria. "The Effects of Choice in the Classroom: Is there too little or too much choice?" *Support for Learning* vol. 30, no. 2, 2015, pp. 105-120. Wiley-Blackwell.

Boal, Augusto. *Theatre of the Oppressed*. New York: Theatre Communications Group, 1985.

Bolkan, Joshua. "Compass Learning Unveils Personalized Learning Tool." *THE Journal*. 1105 Media Inc. Web. 9 June 2017.

Booth, Eric. "Creative Engagement in Schooling." Web. 5 Apr. 2015. <http://ericbooth.net/creative-engagement-in-schooling/>

Brenneman, Ross. "Gallup Student Poll Finds Engagement in School Dropping by Grade Level." *Education Week*. Editorial Projects in Education, 10 Mar. 2017. Web. 9 June 2017.

Brooks, Peter. *Reading for the Plot: Design and Intention in Narrative*. Cambridge, MA: First Harvard University Press paperback edition, 1992.

Bruner, Jerome. "The Narrative Construction of Reality." *Critical Inquiry* vol. 18, 1991, pp. 1-21. The University of Chicago.

Campbell, Colin. "Making Your Own Visual Novel Is Becoming so Much Easier." *Polygon*. Polygon, 7 Apr. 2015. Web. 9 June 2017.

Change the Equation. “About Change the Equation.” Web. 5 Apr. 2015. <http://www.changetheequation.org/about-change-equation>.

CPALMS. “Driver Education/Traffic Safety-Classroom.” Web. <http://www.cpalms.org/Public/PreviewCourse/Preview/13935>.

Cialdini, Robert B. “What’s the Best Secret Device for Engaging Student Interest? The Answer is in the Title.” *Journal of Social and Clinical Psychology* vol. 24, 2005, pp. 22-29. Web. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.702.7126&rep=rep1&type=pdf>.

Crecente, Brian. “U.S. Department of Education: The Future of Education Includes Video Games.” *Government Technology*. Web. 14. Apr. 2015. <http://www.govtech.com/education/US-Department-of-Education-The-Future-of-Education-Includes-Video-Games-in-Classrooms.html>.

Cron, Lisa. *Story Genius: How to Use Brain Science to Go Beyond Outlining and Write a Riveting Novel (Before You Waste Three Years Writing 327 Pages That Go Nowhere).* New York: Ten Speed Press, 2016.

Doh, Jane. “Pistolsniffer Industries: Head into the Woods with Earl and Randy.” *ARGNet*. Web. 14 Oct. 2010 <http://www.argn.com/2010/10/pistolsniffer_industries_head_into_the_woods/>.

Dreyfus, Hubert L. “Intelligence without representation – Merleau-Ponty’s critique of mental representation.” *Phenomenology and the Cognitive Sciences* vol. 1, 2002, pp. 367-383. Kluwer Academic Publishers. Web. <https://link.springer.com/article/10.1023/A:1021351606209>.

Duggan, Maeve. "Gaming and Gamers." Pew Research Center: Internet, Science & Tech. Pew Research Center, 15 Dec. 2015. Web. 9 June 2017.

Ferguson, Christopher. "Video-Game Heroines Can Kick Sexism's Butt." *The Chronicle of Higher Education*. Chronicle of Higher Education, 6 Dec. 2015. Web. 9 June 2017.

Foltz, Mark A. MIT. *Designing Navigable Information Spaces,* 20 May 1998. Web. <http://www.ai.mit.edu/projects/infoarch/publications/mfoltz-thesis/node8.html/>.

“Future Ready Learning: Reimagining the Role of Technology in Education.” Office of Educational Technology. Department of Education, Jan. 2016. Web. 5 Jan. 2016 <http://tech.ed.gov/netp/introduction/>.

GetEducated. “Nursing Degrees Online Use Second Life Virtual Reality for Teaching.”

Web. 30 Mar. 2015. <http://www.geteducated.com/healthcare-a-nursing/339-online-nursing-degree-programs-teach-using-second-life-virtual-simulation>.

Gibson, James Jerome. *The Ecological Approach to Perception*. New Jersey: Lawrence Erlbaum Associates, 1986.

Gilbert, Susan. "The Economic Advantage of Online Education." *Huffington Post*, 17 Apr. 2012. Web. 1 Apr. 2015.

Gottschall, Jonathan. *The Storytelling Animal: How Stories Make Us Human*. Boston: Houghton Mifflin Harcourt, 2012.

Heath, Chip, and Dan Heath. *Made to Stick: Why Some Ideas Survive and Others Die*. New York: Random House, 2008.

Herman, David, et al. *Narrative Theory: Core Concepts & Critical Debates*. Columbus, OH: Ohio State University, 2012.

Hibbing, A.N., and Rankin-Erickson, J.L. "A picture is worth a thousand words: Using visual images to improve comprehension for middle school struggling readers." *The Reading Teacher*, vol. 58, no. 8, 2003, pp. 758-770.

"Is High School Just A Game?" Insego, 16 Sept. 2015. Web. <http://insego.com/high-school-game/>.

Jackson-Hayes, Loretta. "We don't need more STEM majors. We need more STEM majors with liberal arts training." *Washington Post*, 18 Feb. 2015. Web. <http://www.washingtonpost.com/posteverything/wp/2015/02/18/we-dont-need-more-stem-majors-we-need-more-stem-majors-with-liberal-arts-training/>.

Joffe, Mike. "Spect-actors in Novels and Video Games." *Video Games of the Oppressed*, 12 May 2013. Web. 12 May 2013 <https://videogamesoftheoppressed.wordpress.com/2013/05/12/spect-actors-in-novels-and-video-games/>.

Journey. Foster City, CA: Sony Computer Entertainment America, 2012. Computer software.

Kenny, R., & McDaniel, R. The role teachers' expectations and value assessments play in their adopting and integrating video games into the curriculum. *British Journal of Educational Technology*, vol. 42, no. 2, 2011, pp. 197-213.

Kentucky Route Zero. Computer software. Cardboard Computer. Web.

Klimas, Chris. Twine. Computer software. Twine/ An Open-source Tool for Telling Interactive, Nonlinear Stories. Web. <https://twinery.org/>.

Konnikova, Maria. "How Stories Deceive." *The New Yorker*. The New Yorker, 8 June 2017. Web. 9 June 2017.

LaFond, Gerard. "Why Education Needs to Get Its Game On." *Mashable*. Mashable, 13 Oct. 2011. Web. 9 June 2017. < http://mashable.com/2011/10/13/education-gaming/#Yf7dlnbeFkq6>.

Lazzaro, Nicole. "Why We Play Games: Four Keys to More Emotion Without Story." XEODesign, Inc., 8 Mar. 2004. Web. 1 Oct. 2017. <http://xeodesign.com/xeodesign_whyweplaygames.pdf>.

Lindgren, R., & McDaniel, R. "Transforming Online Learning through Narrative and Student Agency." Educational Technology & Society, vol. 15, no. 4, 2012, pp. 344–355.

Love, Christine. *Analogue: A Hate Story*. Computer software. <http://ahatestory.com/>.

Lux, Michelle. Online interview, October 28, 2017.

MacLeod, Kevin. Incompetech. Web. <https://incompetech.com/music/>.

Malan, Andre. "School Is Just a Game… Let's Make It a Better Game." Andremalan.com, 21 Mar. 2010. Web. <http://andremalan.com/2010/03/21/school-is-just-a-game-lets-make-it-a-better-game/>.

Mar, Raymond A., et al. "Exposure to media and theory-of-mind development in preschoolers." Cognitive Development, vol. 25, 2010, pp. 69-78. Elsevier. Web. <https://pdfs.semanticscholar.org/7dd1/db7c157d2ddc561e228132f6e68547802604.pdf>.

"Mathematics through Aboriginal Storytelling." Math Catcher. Simon Fraser University. Web. 9 June 2017.

McDaniel, R., & Kenny, R. Evaluating the relationship between cognitive style and pre-service teachers' preconceived notions about adopting console video games for use in future classrooms. International Journal of Game-Based Learning, vol. 3, no. 2, 2013, pp. 55-76.

Miller, Andrew. "Game-Based Learning Units for the Everyday Teacher." Edutopia. George Lucas Educational Foundation, 26 Sept. 2011. Web.

<http://www.edutopia.org/blog/video-game-model-unit-andrew-miller>.

Miller, Andrew. "Get Your Game On: How to Build Curriculum Units Using the Video Game Model." *Edutopia*. George Lucas Educational Foundation, 17 Oct. 2011. Web. 9 June 2017.

Murray, Janet Horowitz. *Hamlet on the Holodeck -- The Future of Narrative in Cyberspace*. New York: MIT, 1997.

National Commission on Terrorist Attacks Upon the United States. "9/11 Commission Report." Web. 3 Apr. 2015. <http://www.9-11commission.gov/report/911Report_Exec.htm>.

NCTE. "Using Comics and Graphic Novels in the Classroom." *The Council Chronicle*. Web. 30 Mar. 2015. <http://www.ncte.org/magazine/archives/122031>.

Neck, Heidi. "Using Comics and Graphic Novels in the Classroom." *The Council Chronicle*. Web. 30 Mar. 2015 <http://www.ncte.org/magazine/archives/122031>.

Neck, Heidi. "The Entrepreneurial Skillset of Storytelling." *Forbes*, 14 Jul. 2014. Web. <https://www.forbes.com/sites/babson/2015/07/14/the-entrepreneurial-skillset-of-storytelling/#12276add1e56>.

Noel, Katherine. "19 Soft Skills Every Leader Needs to Be Successful." *Business Insider*. Business Insider, 27 Apr. 2016. Web. 9 June 2017.

Novotney, Amy. "Gaming to Learn." *Monitor on Psychology*, vol. 46, no. 4, 2015. http://www.apa.org. American Psychological Association. Web. <http://www.apa.org/monitor/2015/04/gaming.aspx>.

Paul, Annie Murphy. "Your Brain on Fiction." *The New York Times*, 17 Mar. 2012. Web. < http://www.nytimes.com/2012/03/18/opinion/sunday/the-neuroscience-of-your-brain-on-fiction.html?pagewanted=all&_r=1>.

"Pearson Collaborates with Boy Scouts of America to Transform Digital E." PRWeb. Vocus PRW Holdings, 9 June 2015. Web. 9 June 2017.

Perdue, Brandon. "Ethical Dilemmas and Dominant Moral Strategies In Games." *Gamasutra*. Web. <http://www.gamasutra.com/view/feature/134828/ethical_dilemmas_and_dominant_.php>.

Postman, Neil. *Amusing Ourselves to Death: Public Discourse in the Age of Show Business*. London: Penguin Books, 2005.

Reiners, Torsten. *Gamification in Education and Business*. Switzerland: Springer International Publishing. 2016.

Ren'py. Computer software. Tom Rothamel. Web. <https://www.renpy.org/>.

Scarry, Elaine. *Dreaming by the Book*. Princeton, NJ: Princeton UP, 2006.

Scheibehenne, Benjamin, et al. . "Can There Ever Be Too Many Options? A Meta-Analytic Review of Choice Overload" *Journal of Consumer Research*, vol. 37, 2010, pp. 409-425. Oxford University Press.

Schwatrz, Barry. "The Paradox of Choice." TED, July 2005. Lecture.

Sedlacek, William E. "The Case for Noncognitive Measures." *The Case for Adding Noncognitive Variables as Admissions Measures*. Web. <http://williamsedlacek.info/publications/articles/Kimmel-Sedrev-2-14-05.htm>.

Shapiro, Lawrence E. *How to Raise a Child with a High EQ: A Parent's Guide to Emotional Intelligence*. New York: HarperCollins Publishers, 1997.

Sheehy, Kelsey. "High School Students Not Prepared for College, Career." *US News*. U.S. News & World Report, 22 Aug. 2012. Web. 10 Feb. 2015.

ShikemokuMK. TyranoBuilder. Computer software. TyranoBuilder Visual Novel Studio. NYU Media Limited. Web. <http://tyranobuilder.com/>.

Silvia, Paul J. "Interest: The Curious Emotion." *Current Directions in Psychological Science*, vol. 17, no. 1, 2008, pp. 57–60.

Squire, Kurt. *Video Games and Learning: Teaching and Participatory Culture in the Digital Age*. New York: Teachers College Press, 2011.

"STEM to STEAM." STEM to STEAM. Rhode Island School of Design. Web. <http://stemtosteam.org/>.

Suits, Bernard. "What Is a Game?" *Philosophy of Science*, vol. 34, no. 2, 1967, pp. 148–156.

"The Students' Right to Read." *NCTE Comprehensive News*. National Council of Teachers of English. Web. 9 June 2017.

Toppo, Greg. *The Game Believes in You: How Digital Play Can Make Our Kids Smarter*. New York: St. Martin's Press, 2015.

Wiggins, Grant P., and Jay McTighe. *Understanding by Design*. 2nd ed. Alexandria, VA:

Association for Supervision and Curriculum Development, 2005.