

Minecraft as a Creative Tool: A Case Study

Maria Cipollone, Temple University, Philadelphia, PA, USA

Catherine C. Schifter, Temple University, Philadelphia, PA, USA

Rick A. Moffat, Temple University, Philadelphia, PA, USA

ABSTRACT

Many scholars are enthusiastic about the potential learning opportunities present in the sandbox-style gaming environment, Minecraft. In the following case study, the authors explored the use of Minecraft in a high school literature class and the presentation of characterization and plot in three student-made machinima, or films made in the game world. The authors demonstrate that Minecraft offers a unique opportunity for students to display their creativity and understanding of concepts in ways that are more feasible than if they were attempted in the “real” world. It is also relevant to point out that the epistemology associated Minecraft is constructionist in its nature, which implicates a different style of instruction than is typically employed in the U.S. classroom. The authors pose some questions about the diffusion of games like Minecraft in the future, based on their discussion of similar technologies in the past.

Keywords: Constructionism, English Literature Curriculum, Learning, Minecraft Video Games

INTRODUCTION

Over the last decade, the affinity between video games and learning is an energized subject across educational and industry settings. Academics posit that video games provide endless opportunities for players to learn via innovation, persistence, and problem solving (Gee, 2007, Malone & Lepper, 1987; Shaffer, 2006, Squire, 2005). Connolly (2011) notes that the advantages include, “increased motivation and engagement, an enhanced learning experience, and improved student achievement and retention” (p. vii).

James Paul Gee is one of the many scholars to recognize the benefits of video game-based learning and its potential for deep and meaningful learning practices. Gee was certainly not the first to advocate for video games as a form of learning (McGonigal, 2008; Prensky, 2006; Salen, 2008; Shaffer, 2006; Squire, 2005), but his interpretation of the challenges and opportunities inherent in video games has drawn attention to “good video games” (Gee, 2007, p. 12). To summarize his complex discussion, “good video games” are games in which game design is dedicated to enjoyment and challenge, rather than educational ends. The games Gee

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speaks of happen to be some of the more commercially popular titles (e.g., *Halo* and *Legend of Zelda*).

Scholars at the forefront of this movement claim that game-based learning activities are “most powerful when they are personally meaningful, experimental, social, and epistemological all at the same time” (Shaffer, Squire, Halverson, & Gee, 2004, p. 105). To investigate the learning outcomes based on this claim, the authors conducted a case study using *Minecraft*, a commercially popular video game, as a learning tool. The authors discuss the results of the case study to elucidate the potential uses of commercially popular video games like *Minecraft* in formal educational settings.

Although Gee is often credited for his role in video games and learning scholarship (Alexander, Eaton, & Egan, 2010; Epper, Deryberry, & Jackson, 2012; Mishra & Foster, 2007), other technological and economic factors have contributed to the growing interest in the potential of video games. The explosion of casual gaming on smart phones and tablets have led to presence of digital games in everyday life (Juil, 2010). Whether through mobile applications (e.g., *CandyCrush*), “gamified” systems (e.g., *Nike+*) or social network site games (e.g., *Farmville* or *Mafia Wars* on Facebook®), many more people spend their time in the game space.

Additionally, research shows that video game culture is embedded in the culture of most young people in the United States. Young people represent a large portion of those who engage in these types of game spaces, thus their popularity among this population presents many clues about their preferred modes of participation, interaction, and collaboration. The Pew Internet and American Life project report summarized the common practice of video gaming in the lives of young people stating, “Video gaming is so widespread among American teenagers that to paint a portrait of a typical teen gamer is to hold a mirror to the population of teens as whole. Nearly every teen plays games in some way, regardless of gender, age, or socioeconomic status” (Lenhart, Kahne, Middaugh, Macgill, Evans & Vitak, 2008, p. 7).

The popularity of both games, and in particular, collaborative gaming and knowledge sharing (like that which occurs in *Minecraft*), represents a practice that might inform successful models of twenty-first century learning environments. At this point, the knowledge that young people gain in these gaming environments is mostly informal; they get it by asking friends and searching user-generated content for instruction, rather than a formal instructional experience, or using trial and error (Beck & Wade, 2004). These informal learning networks are of particular interest to many: K-12 education reform advocates, economists, video game developers, and researchers, because the technology of video games provides clues to the types of literacy that will be valuable for future professionals (Beck & Wade, 2004). As digital technologies like video games proliferate, the global economy slumps, and U.S. education systems struggle to prepare students for an unprecedented future, many have placed their hopes on the potential for video games to assist in education (Gee & Hayes, 2011).

As Old As the Games Themselves

Despite the recent surge, the academic interest in the potential learning benefits of video games is almost as old as video games themselves (close to 40 years old); (for a more comprehensive review see Ito, 2008; Randel, Morris, Wetzel, & Whitehill, 1992). Yet, only recently have scholars have acknowledged that non-educational games implicate a different set of learning practices and epistemological outcomes. Ito’s (2008) thorough analysis of children’s software demonstrates that traditional instruction-centered views about learning and curriculum can dampen the benefits of video games, and take motivation completely out of the equation. When game designers try to embed games with traditional curriculum, the motivational, collaborative, and engaging elements of the game are mostly lost on its audience. Ito explains that many video games created for educational purposes are, “[F]ocused on curricular content, rather than innovative game

play” (2008, p. 93). These games emphasize external rewards and reinforcement for very school-like tasks (p. 94). When educational content is forced into the video game medium, young people are quick to recognize the ruse, and find the experience mostly distasteful and detrimental to their motivation (Bruckman, 1999; Ito, 2008).

Video games (i.e., often those that are commercially popular)—which *don't* overlay traditional instructional practices onto gaming landscapes—present players with learning scenarios that differ from the structural elements of the typical K-12 learning environment (Squire, 2005). This study presents a case in which literature concepts were taught using what Gee (2007) might call a “good video game”.

In the present study, participants found a less costly way of exploring literature concepts that were freed from traditional instruction materials using *Minecraft*. However, as the authors discuss in detail later, if those dedicated to the potential of video games in the formal education setting, the successful use of the technology will depend on an acceptance of a new style of teaching and learning—one that is centered on exploration, production skills, and self-(or collaboratively) authored artifacts (Gee & Hayes, 2011, 2012; McGonigal, 2008). After presenting the case study using *Minecraft* in the classroom, this paper will discuss the epistemological outcomes that arise when implementing video game technology, like *Minecraft*, in the classroom. Moreover, the authors draw on previous literature from the learning sciences and technology in education to consider lessons from the past to inform the integration of video game technologies such as *Minecraft* the classroom (Johnson, 2006; Kafai & Resnick, 1996; Papert, 1993; Schifter, 2008).

The next section will describe *Minecraft* and its goals and objectives as well the community of practice that has grown around the game in a few short years. Then, the authors will discuss their rationale for studying *Minecraft* in the classroom, followed by an analysis of their observations.

Minecraft: A Game World, Not Just a Game

Minecraft's lure and charm are difficult to assess when taken at face value. The game was initially designed as a pure sandbox-style game, meaning there is no linear narrative structure that guides players. Like other sandbox-style games, such as *The Sims*, the game's success thrives on the productions that are the result of experimentation with the environment, either alone or on servers with multiple players. However, unlike *The Sims*, *Minecraft's* environment is very graphically simple, and encourages more interaction with naturalistic or almost agrarian activities (e.g., mining coal, crafting shelters, or harvesting wheat) than the activities that are associated with contemporary life in *The Sims* (e.g., purchasing prebuilt homes, or working at an advertising agency).

Markus “Notch” Perrenson, the initial game designer, created *Minecraft* to be intentionally simple and open so that users could interact with virtual environments that are normally static in most video games (Levin, 2013). The entire game environment (e.g., trees, rivers, chickens, and zombies) is composed of $1m^3$ blocks that look like *Lego*[™] bricks. The most basic goal is to break and place these blocks to create structures.

There are two options for game play in *Minecraft*: survival mode or creative mode. In survival mode, players must craft tools by collecting materials (e.g., cobblestone, oak wood) to harvest food (e.g., wheat for bread) and structures (e.g., houses or huts) to survive menacing threats (e.g., zombies that eat players or skeletons that kill players with arrows). Survival mode is a more goal-oriented mode, where a player attempts to harvest as many resources and thrive as fruitfully as possible given finite resources (i.e., going beyond merely surviving starvation and death, such as mining diamonds or creating fire). A player is successful in survival mode if he or she can not only survive threats, but also thrive despite that threat. A more successful player will be distant from the threat of death (e.g., having created

an underground city, free from the threat of zombies or being able to harvest a vast amount of food and materials). In contrast, creative mode offers the player an unlimited amount of resources with no threat of death or starvation. Although creative mode is safer, players demonstrate creativity and skill in the way they chose to survive. The goal in creative mode is to explore the environment and to construct any landscape, structure, or scene that the player or players desire.

Though there are millions of other games that involve the elements of survival, creation, and multiplayer collaboration, *Minecraft*'s game developer, Mojang, has intentionally legitimized and relied upon the contributions of its player community in ways unlike many other game developers. The game's popularity has been partly based on the fact that the player community has created a vast and well-documented community of practice that includes tutorials, modifications, communal servers for multiplayer engagement, and creations that have incorporated *Minecraft*-based recreation of popular culture. For example, players have created a replica, to scale, of the *Starship Enterprise* and the Hogwarts School from *Harry Potter*. There is even a modification to the game to make the landscape into the space from the popular literature series the *Hunger Games*, where players can act as the characters. Lastowka (2012) aptly points out that this "amateur" production is typical in digital gaming (and germane to Web 2.0 practices), but *Minecraft*'s commercial success is based on the creative production of "amateurs". In Lastowka's words, "To play *Minecraft* is to use the game as a creative tool. *Minecraft* requires players to be creative, even if that creativity is limited to designing a crude shelter or tunneling the layout of a mine" (2012, p. 10).

Another creative aspect of the game is the continuing updates, which can have users import and share pre-built structures as modifications—most of these were not initiated by the creator of the game but by users who saw a need and "created" a modification to solve the need, thus transforming the game environment. In 2012,

a modification called *MinecraftEDU* was created specifically for use in educational settings (Levin, 2013). Truly, the *Minecraft* community of players is based on creative prowess, from the ingenuity inside game worlds to the creative modifications that players make to the game experience itself. The case study presented in the paper accepts Lastowka's (2012) argument that *Minecraft* is rooted in the free exchange of creativity and users' creations, and shows that *Minecraft* can serve as a creative space for students to express their understanding of literary concepts. The next section of the paper describes the research setting and the student films that served as data for the case study.

PROCEDURES

This case study presents a research scenario where one English teacher from the Northeastern region of the United States used the game *Minecraft* to explore literary concepts required by the state's core curriculum in the high school classroom. The authors agreed to provide a communal server for the participants and instructor to produce their creations, and they observed the participants' films, or machinima, as a demonstration of their learning. The author also interviewed the instructor at during and at the end of the six week unit.

The high-school instructor proposed that he would use the game to explore the concepts of characterization and plot with a small sample of ninth and tenth ($n=20$) grade participants in his English literature course. The participants were divided into five groups of four participants each. According to the instructor's informal survey of the class, only one student was playing the game at that time. Thus, 19 out of 20 participants were unfamiliar with the game and how it was played. After introducing them to the game environment, he then introduced the assignment. The instructor gave the participants a prompt that they could use (it was optional to use this plotline) to assist their creativity. The assignment was as follows:

Parents are out of town and kid is being pressured to host a party. He/she agrees and the party quickly gets out of hand.

The desired outcome of this assignment was a video of the narrative, or machinima, developed by each group to demonstrate their understanding of the literary concepts. Machinima (the amalgamation of “machine” and “cinema”) are 3D animated films created within a gaming environment. They are a common cultural practice among more dedicated (i.e., “hard core”) video gamers (Johnson & Pettit, 2012).

The high school instructor gave the participants two options to achieve the assignment – they could use *Minecraft* to create their video using game play captured using free software called Bandicam (Bandisoft, 2013), or they could video their story using a video camera. One group of four female participants decided to physically act in their own film, while the other four groups (one of which did not finish the final film) groups chose to develop their stories using *Minecraft*. When the authors followed up with the participants about why they preferred not to use the game and why some did not finish the project, they expressed a lack of interest in the game or that they found it boring. Although they did not have time to follow up further on why these participants found the game boring, the authors found this result to be both a limitation and an opportunity for further research. The outcome suggests that simply bringing a commercially popular video game into the classroom will not automatically encourage all audiences, and there are technological and motivational barriers that will fail to engage some learners. Furthermore, the teacher did not provide the authors with the film that the participants in this group had made, or the authors might have been able to look at differences in the creative expressions. Instead, this case study focuses on the machinima that the participants produced.

The instructor carved five class periods for the participants to capture their narratives using either *Minecraft* (the “classic” version, not *MinecraftEDU*) or using the video camera.

Prior to the first of these five class periods, the participants were to collaborate outside of class to start to develop their storyline. Then, during these class periods, the participants went to a computer lab to practice their stories, capture pieces in video to review, and then given time to revise their stories. The all-female group was also given time to capture their storyline using the video camera. When the *Minecraft* groups were capturing their video within the game, the authors observed how the teacher interacted with them in that environment to assess how the instructor facilitated the participants’ use of the game environment.

Creativity That is Less Costly

The case study presented in this paper demonstrates that *Minecraft* can be used a space for participants to express their creativity in ways that would typically be much more costly. Also, the open-nature of the game allows the participants to experiment with various conceptions of characterization and plot that are not limited to physical materials. They are able to create fantastical characters and storylines because the game world provides participants with the space to do so. The authors will now discuss the type of plots and characterizations that they observed in the machinima, and try to assess the understanding of characterization and plot the participants demonstrated.

The older ($n= 4$, ages 15-16) participants in the study took a complete departure from the suggestion prompt, and developed their own story, “A Burning Passion”. The story features Joseph, a young man who had the unfortunate experience of watching his parents burn in a fire when he was very young; a fire that he mysteriously caused. The first scene features him weeping by his parents’ graves, and refusing to go and live with his uncle because if Joseph lives with him, his uncle will soon meet a similar fate. As Joseph warns his uncle, the audience sees a lightning bolt ignite a fire in the distance. Here the participants offer the audience their version of characterization by introducing a

Figure 1. In “A Burning Passion”, participants crafted a character that struggles with his fatal flaw--those he loves are doomed to burst into flames



character with a tragic flaw—everyone he loves is doomed to burst into flames.

In their story, “The Hole”, ($n=4$, ages 13 and 14) a group of ninth graders introduce the audience to another type of characterization via Roy, a delusional young man who is restrained by his family because he insists on digging holes. Roy digs holes because he is instructed to do so by a fun-loving bunny rabbit, that only he sees. Beneath his house, Roy has constructed an entire world where he and his bunny friend can cause destruction. When Roy expresses his distaste for the rabbit’s incessant chattering (about nonsensical things), he barks at the rabbit: “Who are you, anyway?” The rabbit answers: “But Roy, I am *you!*” Here, the participants create Roy, who is odd and anti-social, but who has control in his purpose (to create underworlds), even if his mind deviates from reality. The participants have developed a character with multiple personalities, using the space of the game to explore a complex range of character traits.

The third group of participants created a horrific tale called, “Flesh Eating Predator” ($n=4$, ages 13 and 14), where three friends are trying to find a party, but they seem to show up to an empty house with a creepy host (who is potentially the predator). Two of the friends, Anna and Caroline, are relatively concerned with the appropriate social behavior (wanting to party), but their other friend, Kelly, seems intent on saying socially inappropriate things about her dog and her mom. The character of Kelly seems to represent a social outcast. Once again, the participants are experimenting with different types of characterization, and *Minecraft* provides them with a world in which to explore these concepts.

In both of the stories “The Hole” and “A Burning Passion”, the audience witnesses participants developing characters that who struggle with character flaws. These flaws offer the promise of doom, but overcoming the flaws offer the promise of stability. In the case of “A Burning Desire”, the plot centers on Joseph’s struggle to be intimate with others, because

Figure 2. In “The Hole” Roy is a character who must choose between the love of his family and his alter ego—a bunny rabbit who wants him to commit evil deeds



he fears that they will catch on fire (as all the people that Joseph tends to love happen to do). The participants also grappled with the idea that character flaws may or may not be overcome, as was demonstrated in their plot constructs.

In “A Burning Passion”, Joseph’s continued struggle with his flaw may demonstrate that participants have observed many types of characters throughout their development, both via traditional print texts, films, and television. Joseph’s story is reminiscent of a superhero that struggles with his powers, and is isolated from the thing he desires most: love and intimacy. In the story, Joseph finally opens his heart to another (Jessica) and has a child, only to watch them both be engulfed in flames as the dénouement to the tale. *Minecraft* gives the participants a space in which to explore these types of narratives that would otherwise be costly or near impossible in a formal educational setting.

In “The Hole”, Roy, a delusional young man, also struggles with his character flaw, this time presented as a mental illness. Although Roy develops an alternative personality that compels him to dig holes, and build an underworld

(where the walls are lined with explosives), when his sister comes to rescue him, she is able to coax him back from his violent ways. In the final climax, Roy battles his alternate ego and destroys him in order to join the ranks of his more “normal” family. *Minecraft* gives the participants the space to experiment with creative plot lines to understand how characters resolve or succumb to their flaws. In this case, *Minecraft* is a vehicle where the participants can creatively express their conceptions of characterization and plot in less costly and accessible ways.

“The Flesh-Eating Predator” narrative is less resolute. Kelly is murdered by the predator, and her friends meet a similar end. In a follow-up discussion with the instructor, he explained to the authors that the participants in this group failed to plan their machinima well. This lack of planning holds implication for the type of instruction that is needed to scaffold *Minecraft* in the classroom because the teacher does not directly transmit material to the participants, but rather allows them to create their own characters. Not every student will naturally succeed at this

type of project because they are interested in *Minecraft*. The authors discuss this issue later in the discussion section.

The development of the plot in the participants' film gives them a chance to explore the concept of characterization in a way similar to a cinematic perspective, rather than the static identification of elements that are offered in more traditional texts. The open nature of *Minecraft* gives the participants (or players) the tools to construct characters and plots that, while archetypal in their nature, represent their creative understanding of characterization and character development, and are not tied to specific text. Squire (2008) calls sandbox games like *Minecraft* "ideological worlds" where players can develop their own creations, concepts and value systems. Motivated to build a theoretical model, he explains that "epistemic" video games, such as *Supercharged!*, teach students about specific knowledge systems (in this case, physics), but open-ended games provide a much different and extended experience. Squire sees games like *Minecraft* (in his essay; *Civilization III* and *The Sims*) as a place for players to try on new identities and experiment with them via creative production (p. 172). Squire's description of the possibilities in sandbox games resonates with the observations presented in this study: "As learning contexts, these sandbox games function as design possibility spaces for people, spaces wherein they can develop along trajectories of experience into new ways of knowing, learning, and being in the world" (Squire, 2008, p. 172). The authors of this paper posit that there are many examples of digital tools that draw on similar experiences, but that teachers have not been able to easily incorporate them into the school day in a consistent manner. In the discussion section, the authors address Squire's point about implementation.

Minecraft provides students and teachers with an accessible and low-cost space to express their creativity with literary concepts, but the type of teaching and learning that are implicated when using *Minecraft* signify a different set of skills for both instructor and student. In the section below, the authors draw on the literature

from constructionist practices and technology in education to pose potential questions about the implementation of games like *Minecraft* in educational settings in the future.

DISCUSSION

The goal of this section is to discuss two implications that resulted from the authors' observation of the present case study. First, that *Minecraft* implies a more constructionist form of epistemology. Second, that most teachers can't embrace this type of learning and translate it into instruction practices because of the constraints of the US institutional culture of formal education. The authors pose some of the reasons why this may be true, and what it means for digital tools like *Minecraft*.

Constructionism in Minecraft

From a learning sciences perspective, the type of knowledge production that is encouraged by *Minecraft* can be seen as a constructionist epistemology. Constructionist, the adjectival version of constructionism, is a way of building knowledge through meaningful interaction and experimentation with content. In some ways, one might see the observations from this case study as an account of students experimenting with literary content. Constructionism "shares constructivism's connotation of learning as 'building knowledge structures' irrespective of the circumstances of the learning" (Harel & Papert, 1991, p. 1). It focuses on two processes: an active process through which people construct knowledge in "real" world experiences, which is based in Piagetian *constructivism*, and a the creation of a personally meaningful product (Kafai & Resnick, 1996). In this study, the authors observed the process of meaningful interaction with content, but the analysis focused on the machinima, or final outcome, in order to point to the practical ways that games like *Minecraft* can be tools of creativity.

In the section below, barriers to lasting implementation of tools like *Minecraft* are discussed. First, the authors discuss the initial

impulse to blame teachers, and then they discuss the kind of teachers that typically gravitate to digital tools like *Minecraft*. This discussion leads to a larger contextual dissection of the institutional culture of formal education in the United States, and the ways in which constructionism does not fit well into that culture. Finally, in conclusion, there is a discussion of the implications of these past lessons, and what that might signify for game-based learning in formal educational settings.

Blame the Teacher

Seymour Papert, a prominent student of Piaget's, was one of the first scholars to infuse constructionist practices into digital environments for K-12 students. Papert's *Logo*TM, was designed with constructivist (which he later termed constructionist) learning theories in mind (Ito, 2008). *Logo*TM is a language designed to teach computer programming via the constructionist tradition in K-12 schools. Papert believed, that through experimental interaction with the computing language, students would understand the symbolic functions of the machine on many levels. Although many iterations of *Logo*TM have been introduced since Papert's initial formulation, lessons in computing language still largely remain outside of the formal educational experience. The authors of this paper feel that this is due to two distinct factors. First, the teachers who embrace constructionist technologies or tools are unique compared to the rest of their profession, and second, they value a different type of teaching. A glimpse backwards at the life of *Logo*TM will inform some of the observations from the current case study.

In her work on technology infusion in the classroom, one of the authors of this paper, Schifter (2008), offers two case studies of teachers who successfully integrated *Logo*TM into their classroom curriculum. The first is Mr. Levin, who thought that microcomputing would sharpen his students' analytical and problem solving skills. Levin learned the programming language in the early eighties, and for twelve years, carried out workshops to teach

it to students (until 1994). Mr. DeTolla was a similar story--a teacher who saw the value of programming, and with some administrative support, found ways of teaching the language to as many students as he could reach. These teachers share some major similarities. Cuban (2001) would call these teachers "early adopters" who are technological trendsetters in their school. These individuals are somewhat personally vested in learning the technology (e.g., programming, or playing *Minecraft*), and they insist that the skills they've learned are invaluable to students. They are often correct, but the skills they promote are often lost on other teachers, who are unwilling or uncomfortable with the type of investment it takes to learn the technology they are promoting. In his case studies, Papert (1993) describes one teacher who was not an early adopter. She stopped using *Logo*TM in the classroom because she began to become anxious about having to constantly keep up with her students, and continually learn just beyond their level of expertise. "Early adopters" like Mr. Levin and DeTolla don't face this anxiety, because they are motivated to keep up with the technology no matter the cost of their personal time. But more importantly, they are willing to let students be experts, and be taught by their own students. Teachers like Levin and DeTolla see the technology as inherently fun, and in many ways, it's not work for them to train themselves using the tool (Schifter, 2008).

Like Mr. Levin and Mr. DeTolla (Schifter, 2008), the instructor in the present case study was an "early adopter". He was the only individual teacher in his school to use *Minecraft* to teach literary concepts (or any curriculum at all). In an open-ended response survey instrument, the instructor indicated that he plays *Minecraft* in his personal time, and that he continued to play after the study (C. Reeves, personal communication, June 28, 2012). For the instructor in the present study, there was no steep learning curve; his drive to learn how to play the game was strengthened by his own personal interest in it. While this provides an optimal scenario for "early adopters", these teachers are typically the minority in their profession, and their

interest in the technology has little to do with its widespread acceptance in the school (Johnson, 2006). The authors feel it is important to note that the teacher in the present case study was not a technology teacher in the school as Mr. Levin and Mrs. DeTolla were. Typically, “early adopters” are teachers that are technology teachers to begin with (Schifter, 2008).

In his essay on schools, Papert (1993) uses the term “progressive” educators for a similar phenomenon. Papert explains, “Progressive educators do not see themselves as offering an alternative way to for students to learn the same list of items of knowledge. They value a different type of knowledge” (1993, p. 63). The authors of this paper would extend Papert’s claim, saying that “progressive” instructors also value a different type of teaching, where the teacher supports students in non-traditional ways, and grows personally with the students. The instructor in the present case study expressed similar sentiments when he explained, “It felt great [to relinquish authority]. I love the idea and the practice of being a facilitator, coach, or mentor, rather than the seat of knowledge. I [previously] had an excellent rapport with this year’s students, so I can’t speak to whether or not this project changed anything on a relationship level. This was not scary at all--as some might think” (C. Reeves, personal communication, June 28, 2012). In this case, the instructor valued that the students were commanding their own experiences with the machinima, and that the responsibility of being the “seat of knowledge” was off of his plate.

Papert (1993) discusses a similar experience with teachers who were anxious about the implementation of *Logo*TM, which he equates with a type of “learning in use”. In his words, “Learning-in-use liberates the students to learn in a personal way, and this in turn liberates teachers to offer their students something more personal and more rewarding for both sides. But this prospect does not come without problems, and some teachers will see it more as a threat than as a liberation” (Papert, 1993, p. 65). In the current case study, the instructor did not perceive *Minecraft* as a threat, but as a way to

develop a stronger rapport with his students. The authors believe this evidences Cuban’s (2001) concept of the “early adopter”, or Papert’s (1993) “progressive educator”, who is inclined to dive into a digital world with students, unlike many of his or her colleagues.

The authors of this article posit this discussion to link *Minecraft*’s recent popularity in formal learning environments (Levin, 2013) with other formulations of constructionist learning tools such as Papert’s *Logo*TM. Lessons from technologies past show educators that similar patterns emerge when examining the type of teacher that gravitates toward these types of technologies. These lessons hold implications for the diffusion of game-based learning environments in the future.

However, the blame for the prior lack of diffusion should not be squarely placed on the heads of instructors who are reticent to experiment with them. There are many instructors who are willing and invest a great deal of professional time into learning new digital technologies (Schifter, 2008). It seems that the culture of formal education in the United States, and its institutional structure, meets tools like *Minecraft* with opposition. The next section gives readers a glimpse of the institutional approach to literary concepts of characterization and plot, and how they denote a type of knowledge that is different from the constructionist knowledge presented in the case study. Finally, the authors conclude with some relevant questions about how the current study and past scholarship might inform the implementation of “good video games” like *Minecraft* in the classroom.

Blame the Institution

To add some perspective on how the literary concepts are typically conceived in U.S. classrooms (particularly in the Northeast United States), the authors consulted the Common Core State Standards, which were defined by the U.S. federal government in 2010 as “core” curricula to standardize all versions of teaching foundational conception to students. Not without controversy, the Common Core State

Standards attempt to align the curricular goals of all 50 states, in order to ensure more efficient teaching, and of course, to ensure that students are taught to take the federally mandated assessments (Krashen, 2012). The state where the study was conducted (Northeast United States) has aligned their K-12 curriculum to match the recommendations of the federal government in 2011 (Common Core State Standards Initiative, 2012). This comparison serves to demonstrate the how K-12 teachers are trained to teach these abstract concepts, and that the type of instruction is explicitly tied to the standardized assessment tools.

The Core Curriculum State standards for ninth and tenth grade students *do* suggest a more complex understanding of diverse perspectives, much like the ones observed in the machinima. For example: “Analyze how an author’s choices concerning how to structure a text, order events within it (e.g., parallel plots), and manipulate time (e.g., pacing, flashbacks) create such effects as mystery, tension, or surprise” (Common Core State Standards Initiative, 2012). But, a more specific example demonstrates how a teacher might implement this: “students summarize the development of the morality of *Tom Sawyer* in Mark Twain’s novel of the same name and analyze its connection to themes of accountability and authenticity by noting how it is conveyed through characters, setting, and plot” (Common Core State Standards Initiative, 2012).

The type of knowledge disseminated by the core standards is different than asking students to build their concepts of characterization and plot in a virtual space. Here, the knowledge is structured and tethered to specific examples, so that it is organized, catalogued, and easily transmitted to students. Papert (1993) might describe the objectives of the Common Core in this way, “the knowledge [has been placed] into teachable bites so that they can be fed to the students one at a time by a teacher, and this leads straight into the traditional paraphernalia of curriculum, hierarchy, and control” (p. 65). While Papert’s commentary is unnecessarily dark, at

the same time, he implicates an institutional culture that is very real in the United States.

Lipman (2011) suggests that these organizational structures are driven by the need for United States’ urban centers to be more attractive to global investors. Administrators incorporate high-stakes testing and accountability in public school systems in an attempt to clean up visible economic disparities that often appear in achievement gaps. In her study of Chicago schools, Lipman (2011) compares the institutional climate of U.S. schools to a corporate culture where top-down mandates that drive accountability leave instructors unable to experiment with innovative curriculum because they fear losing their jobs. As long as teachers and schools are held accountable for standardized indicators as though they are corporate-like employees, then video games may continue to be antithetical to 21st century classrooms because they represent a risky choice.

The authors hope that this discussion contextualizes some of the reasons that teachers seldom venture into—or stay in—the world of digital technologies, because the institution that they work in is not structured to assess or reward their success with these tools. In many ways, the institutional culture of the U.S. education system encourages instructors to stay within the confines of the hierarchy because it values hierarchical knowledge for student and employee assessment.

The authors of this article acknowledge that tools like the Common Core are valuable for certain types of teaching and learning, but they feel it important to point out that so long as there stands the opposition between the culture of games like *Minecraft* and the institutional practices of U.S. education systems, the participants’ experiences that are presented here will not be common or mainstream.

CONCLUSION

The authors have provided one case study that demonstrates the potential for *Minecraft* to provide meaningful learning scenarios, of which

others have discussed (Gee, 2007; Shaffer, 2006; Squire, 2005). Furthermore, it can provide a space for students to create works that would be costly or impossible otherwise. As a point of discussion, this paper presents the notion that there is a tension between the knowledge production that is characteristic of the game, and the culture of the formal education system in the United States. This leads the authors to question the future of digital learning tools like *Minecraft*. The authors ask: if learning tools similar to *Minecraft* have existed for nearly 30 years, and scholars call for the integration of these tools into the mainstream environment, does the presence of easy, low-cost options like *Minecraft* necessarily mean that the digital revolution of classrooms is now poised to occur? Will educational versions of “good video games” succeed (e.g., *MinecraftEDU* or *SimCityEDU*) where *Logo™*, has failed? The authors feel that, although digital learning tools have transformed greatly since the time of Papert, it is the institutional culture of formal education in the U.S. that does not support the type of learning inherent in constructionist experiences like *Minecraft*. It may be necessary to consider organizational shifts that better accommodate more of these experiences in the future.

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Maria Cipollone is a Minecraft n00b, a Ph.D. candidate in Media and Communication at Temple University, and a User Experience Researcher at a gaming company. Her research focuses on video games, and their relationship with motivation, learning and telepresence. She is particularly interested in the conditions that lead people to be productive and happy gamers.

*Catherine Schifter, Ph.D. is also a Minecraft n00b, an associate professor in Psychological, Organizational and Leadership Studies (POLS) at Temple University, and a Carnegie Scholar (2000-2001). She directs the Instruction, Learning and Technology certificate program at Temple's College of Education. Her research over the last two decades has focused on distance education and technology integration in education, with recent interest in game based design to assess understanding of science inquiry. In addition to publishing numerous articles, she coedited *The Distance Education Evolution: Issues and Case Studies* (2004), sole authored *Infusing Technology into the Classroom: Continuous Practice Improvement* (2008), and coedited *New Media in Education: Beyond Constructivism* (2010).*

Rick A. Moffat is a hard core Minecraft aficionado and an expert in educational technology implementation. He created and led the Temple University Committee on Games and Play, and was selected to organize and host a month long "Minecraft in Education" webinar series for the MacArthur Foundation's Connected Learning group. He hosts numerous Minecraft servers for research projects at Temple and around the world, and serves as an advisor on the impact and value of video games.