Casting Magic Missile:
The Effect of Role Playing Video Games on Creative Thinking

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Abstract

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Video games are currently a hot topic in educational research. There are studies on almost every aspect of their production and consumption in various stages of completion, yet their effect on creative thinking has not been fully explored. The objective of this study is to show that there is a connection between digital role-playing games (RPGs) and the creative thinking skills students are learning while playing them. How those skills are used outside of the game world is also explored. The study consists of a 10 question survey completed by 97 high school boys and 6 qualitative interviews with the same population. Existing research in the fields of creativity, games and role-playing games, identity, visual culture and art education is examined. Researchers and experts studied include James Paul Gee, Jane McGonigal, Sir Ken Robinson, David Williamson Shaffer and Linda Jackson. This study found that while strong evidence exists to tie DRPGs to creative thinking skills a definitive conclusion was not possible within the scope of the study. The results however appear to support the conclusions of previous research into games and creative thinking. Many correlations between the skills learned from gaming and the skills that support creative thinking were also found. The study includes a discussion on the domain generality of creativity and the argument's impact on art education. The recommendation of this researcher is that a larger, more in-depth study is necessary in order to reach a firm conclusion on this thesis topic.

Keywords: video games, creativity, role-playing games, RPGs, art education, identity, visual culture.

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Video games are a 21.5 billion dollar industry. According to data collected by Epsos MediaCT for the Entertainment Software Association in 2014[1], 59% of Americans play video games; 51% of US households own a dedicated gaming console; 62% of gamers play with others, either in person or online; 44% of game players believe that video and computer games give them the most value for their money compared with DVDs, music and going out to the movies (ESA, 2014). It is important to note that this data is collected by the video game industry itself from a relatively small sampling of 2200 American homes, however it does shed interesting light on who plays video games and how. What was once considered a subculture has evolved, largely due to the connectivity afforded by the internet, to include the majority of American households. People see value in video games and more often research is validating this.

There is debate in the field of art education as to what should and should not be included in its scope. While some maintain that teaching the Eurocentric curriculum of art history and fine art should be the only focus, others believe that we should be moving towards a field that is inclusive of visual culture (Hicks, 2004). New media is a strong presence in students lives and as such some art educators have recognized a need for the study of it in the art curriculum (Parks, 2008). While there has been debate over the inclusion of visual culture in the art curriculum, Dr. Laurie Hicks (2004) art education professor at the University of Maine describes her reasons for inclusion saying that, "art education has an obligation to consider the ways in which art and, more broadly, visual or material culture, affect and are affected by the broader social world in which they

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[1] "The 2014 Essential Facts About the Computer and Video Game Industry was released by the entertainment Software association (eSa) in april 2014. the annual research was conducted by ipsos mediact for eSa. the study is the most in-depth and targeted survey of its kind, gathering data from more than 2,200 nationally representative households. heads of households, and the most frequent gamers within each household, were surveyed about their game play habits and attitudes."

exist." (pg. 286). This broader social world includes video games for the majority of the population.

I used to say that a computer game called The World of Warcraft stole my friends. I said it with a smile but truth be told there were times when I actually felt animosity towards a bunch of pixels on a monitor. As if the game was the reason we couldn't have a conversation without someone bringing up the Blood Elf Hunter character they just created, or their efforts to collect the Njorndar Bone Bow, a prized weapon in the fictional Icecrown Citadel. My friends were all recent college graduates with degrees in creative fields and jobs that didn't challenge them. We were a group of theater majors, writers and artists with a host of creative and interesting skills and yet, no matter the conversation, somehow it all came back to the World of Warcraft, or WoW as it's commonly called.

I was the one holdout of the group. I have never thought of myself as a gamer. While I enjoy games and play them from time to time it has never been with the passion and dedication that I see in the hardcore gamers I know. Sure, I played video and computer games when I was younger. I spent hours trying to, unsuccessfully, vault Roger Rabbit over the fence in his neighbors back yard. I even called the pay by the minute help line after getting so frustrated I convinced myself the system was broken. In the days before you could save your progress I guided a little blue hedgehog named Sonic to the final enemy of the game with 99 tries at defeating him remaining and died each and every time. I even played the table top role playing game Dungeons and Dragons in college and spent hours and weekends hashing out just what would happen if you hit the ceiling of an ice cave with a Wand of Shatter. I still play games and I can spend hours loosing myself

in the puzzles of Portal or fighting back zombies with my friends in Left 4 Dead. Despite this propensity towards gaming I resisted the siren's call of WoW.

My friends made an effort to include me in their pastime but also maintained that it was a huge time commitment and I might be better off if I didn't start. After a while of putting it off I decided to enjoy being the holdout. The one out of the group who didn't play. I was surrounded by gamers and I absorbed their knowledge to the point that I could follow their conversations and even participate, almost like learning another language. At the same time I was separate from it. I could see it's positives and negatives without the investment in the game that the players around me had.

Two years later as an art education masters candidate I began to wonder about the creative aspects of role playing games and their connection to the people I know. All of my friends had been gamers since high school. What was it about these games that seemed to lend itself to creative thinking and problem solving? Did role playing games teach these skills? *Just what, exactly, is the role of creativity in the video game world and do role-playing games affect creativity outside of that world?* What was it about these games that made me notice so many creative thinkers playing them? From there I began to wonder if these people were actually developing their creative problem solving skills by playing the game. Did playing *World of Warcraft* make people more creative and if so, how? These questions are what ended up informing my thesis topic.

I am fluent in gamer jargon to the point that I regularly get mistaken for a gamer myself. Finding the right questions is something any successful research project strives for and someone who is used to hearing the jargon of the gaming world is better

positioned to ask those questions. As a non-gamer with a strong interest in video game culture as well as games effect on the people who play them I felt this topic was one I was uniquely prepared to explore.

The world of digital gaming has grown exponentially in the 40 years since it's birth. In 1972, the single player game *Pong* was released by Atari and widely considered to have started the video game industry. Almost 4 decades later in 2011, the Massively Multi-Player Online (MMO) world of *The Elder Scrolls V: Skyrim,* which was developed and marketed for $85 million dollars, boasted 231,593 people playing concurrently, on one of it's three gaming platforms, the first day of it's release (Bethesda Game Studios, 2013). Today's gamers have their choice of platforms with games available on video game consoles, personal computers, handheld gaming devices, tablets and cell phones. This is radically different from the days of *Pong* which was only available as a freestanding unit that you had to travel to your local arcade to play.

Digital games are a medium that encompasses entertainment, story-telling, problem-solving, reflex, strategy, and many more cognitive functions. A game such as the football simulation game (sim) *Madden 25*, available on the Playstation 4 and XBox One console platforms, allows the player to be the manager of any national football league team. They can trade and draft players, run training camps, play a full 16 game football season and, if their team is good enough, advance to the Super Bowl. *Portal*, a physics based puzzle game offered on the personal computer (PC) or XBox 360 console, gives you the problem-solving task of creating a path through increasingly complex rooms in order to advance your character toward freedom from a robot controlled laboratory.

Plants vs. Zombies, available on the PC as well as tablets and cell phones, falls into the strategy game categorization. It challenges the player to protect their home from a horde of slowly advancing zombies using the strategic landscaping of their front yard with offensive and defensive plants. The console based role playing game Final Fantasy XIII gives players access to a complex storyline with movie quality cut-scenes to advance the plot, characters that grow stronger with experience, fast paced combat and over 100 hours of game play. With so many variations it is challenging to decipher what the focus of a study on digital games should be and which variables will impact the results.

Research on games is extensive. It has told us that playing video games, improves the way we see (Green and Bavelier, 2007), helps us learn (Shaffer, 2006), improves memory (Nauert, 2013), and makes us more creative (Jackson et al., 2011). Despite so much data in the field the negative stereotype that playing games is a waste of time persists. Many educators dismiss games as frivolous at best and damaging at worst. They cite research that says video games make kids violent, though the general consensus in the field is that game violence does not impact the viewer any more than other forms of violent entertainment (Sherry, 2001). Despite this these studies are less publicized or outright dismissed. Anecdotally, educators have a difficult time expressing what it is they don't like about video games apart from a feeling that students should be doing something more productive with their time. In direct opposition to this, a 2011 study from the University of Michigan showed a "significant and positive" correlation between every type of video game playing and creativity (Jackson, et al., 2011).

A creative person, as defined by the renowned developmental psychologist

Howard Gardner, is someone who "regularly solves problems, fashions products, or

defines new questions in a domain in a way that is initially considered novel but that

ultimately comes to be accepted in a particular cultural setting." (Gardner, 1993, p. 35).

Sir Ken Robinson, creativity expert and subject of the most watched TED talk of all time

with 26 million views, put it more simply. He calls creativity "the process of having

original ideas that have value." (Robinson, 2011, TED video). The term creative, or the

skill of creativity is often thought of as one that you either have or don't have. People will

state that they aren't creative because they: can't draw, can't paint, aren't good at studio

art. Looking at Gardner and Robinson's definitions of creativity we can see that "the

process of having original ideas that have value" and "solving problems, fashioning

products and defining new questions" doesn't rely on studio art as a measure of

competence. The Torrence Test of Creative Thinking, widely regarded as the best

measure of creative thinking in the field to date, takes into account several different

measures to determine its results. These include both visual and written components and

assess many different types of creative thinking. Creativity is multidimensional.

Robinson (2011) sums it up neatly in his book *Out of Our Minds*, stating "everyone has a

huge creative capacity as a natural result of being a human being. The challenge is to

develop them." (pg. 3). Creativity is a vital skill that can and must be developed.

The aim of this study is to show a connection between digital role-playing games

and the concepts students are learning while playing them. Particularly the concepts that

have an observable impact on creative thinking and how it is used outside of the world of

the game. It intends to show that digital role-playing games enhance the same areas of learning that game researchers speak of when discussing epistemic games as well as the effect that digital games have on creativity as relevant to the field of arts education.

The research applicable to this study intersects the fields of: games and learning; creativity and learning; visual culture and art education; role-playing games; identity; creativity; as well as research into games and creativity. This study will attempt to show that students who participate in role playing computer and console games can, and do, connect the creative thinking skills they are developing to their lives outside of those games, including classes and school activities.

This is a qualitative, ethnographic study that includes 14 to 18 year old boys in a private, all boys, prep school outside of a major metropolitan area on the east coast of the United States. The survey included was sent to the entire high school, of grades 9 through 12 and answered by 97 of 333 students. There were also five in-person interviews with students who responded to the survey as well as one email interview with a sixth student. As an art teacher at this school I included the students I teach, as well as others in the school that I have access to for the limited scope of this project. While limiting the study to only high school boys may affect my results I believe that they will be a good representation of the male, high school gamer population.

The subjects surveyed in this study speak about their video game playing with passion and get excited when they find someone who shares their interest. While the stigma towards thinking of game playing as a waste of time is slowly being disproven it is still prevalent in the college bound world of this all boys private prep school. Students

are not permitted to play computer or video games during school hours and talk about game playing at home is usually met with disapproval or redirection.

In her TED (Technology, Entertainment, Design) talk *Gaming Can Make a Better World,* Jane McGonigal (2010), an American author, writer, game designer and researcher at the Institute for the Future breaks down the number of hours the average student in a computer gaming society will spend playing games. By age 21 it's 10,000 hours. She points out that 10,080 hours is the number of hours a student in the United States will spend in school from 5th to 12th grade if they have perfect attendance. "So we have an entire parallel track of education going on where young people are learning as much about what it takes to be a good gamer as they are in school." (McGonigal, 2010, TED video). With this amount of time spent playing games it is imperative that we learn what it is that gamers are getting good at.

Marc Prensky (2001), author of *Digital Game-Based Learning,* is a writer and speaker on learning and education, particularly in the digital world. Prensky notes that in a 1991 study "When Play is Productive" William H. Starbuck and Jane Webster found with regards to adults and play at work: "Playful tasks foster creativity. If the playful tasks are new ones, they will put much effort into learning them and exploring them, usually trying to control their own learning." (Prensky, 2001, pg.116). Sivasailam Thiagarajan, a great proponent of game-based learning says, "I think people want learning to be painful. If you look universally at every language, every culture has the equivalent of 'no pain, no gain.' as a proverb. I think it's partly due to the survival need of human beings that usually suffering results in learning. Unfortunately, human beings took

the converse of that to be true; that is to say, if you don't suffer you're not going to learn." (Prensky, 2001, pg. 109).

A researcher at Arizona State University, James Paul Gee has worked in psycholinguistics, discourse analysis, sociolinguistics, bilingual education, and literacy. He has written several books on the subject of video games and learning including, *Good Video Games, Good Learning* and has been widely published in journals on education. From Gee, "When we think of games we think of fun. When we think of learning we think of work. Games show us this is wrong. They trigger deep learning that is itself part and parcel of the fun. It is what makes good games deep." (Gee, 2007, pg. 43).

David Williamson Shaffer is an associate Professor of Learning Science and the University of Wisconsin-Madison and a game scientist at the Academic Advanced Distributed Learning Co-Laboratory. For him "Computer-based games expand the range of what players can realistically do—and thus the worlds they can inhabit and obstacles they can overcome." (Shaffer, 2006, pg. 127). He also argues that "epistemic frames are stable structures that explain how experience in the cultural context of one community can influence how people act in another." (Shaffer, 2006, pg. 163). Shaffer and Gee also discuss the role that identity plays in learning and the opportunity games give to "try on new identities." (Gee, 2007).

Games as shared worlds which their players inhabit is a concept discussed by American sociology professor Gary Alan Fine in his book *Shared Fantasy: Role-Playing Games as Social Worlds*. Fine is widely regarded as the leading expert in the field of role-playing games. There are many game configurations that fall under the categorization of

role-playing games, which are commonly referred to as RPGs. These run the gamut from table top RPGs played with extensive rule books and dice such as *Dungeons and Dragons*, to Massively Multi-Player Online Role-Playing Games (MMORPGs) like *World of Warcraft* and *Elder Scrolls V: Skyrim* played on desktop computers or gaming consoles.

For the purpose of this paper, digital role-playing games will henceforth be referred to as DRPGs. In order to define what makes a DRPG we first need to look at all of the elements that are considered necessary to the category. There are several criteria that a game must include to be considered a DRPG: configurable player characters that improve with experience, a strong story line (Rollins & Adams, 2003, pg. 347), community building, and problem solving (Bowman, 2012). As put by new media professor Matt Barton, "[I]t seems safe to say that the appeal of the [RPG] is more about interacting with other players than roaming about the countryside killing things." (Barton, 2008, p. 40).

The research and opinions put forth by McGonigal, Prensky, Gee, Shaffer, Jackson, Gardner and Robinson will constitute the bulk of this study on digital role-playing games and their effect on creative thinking. It is their ideas and research, supported by qualitative data collected for this paper, that will answer the question as to the effect of these games on transferring creative thinking skills to tasks outside of the classroom.

There is a joke in the table-top gaming community regarding magic using characters called sorcerers. As new, low level characters in the game *Dungeons and*

Dragons, sorcerers aren't very useful. They aren't strong, they get hurt easily and they can cast only one decent spell, Magic Missile. It's not a very powerful spell since it only does low levels of damage to the enemy, but it hits it's target every time and is the one thing sorcerers are good at during the early parts of the game. The joke, popularized by the comedy troupe Dead Alewives, is that when you ask a sorcerer what their next action is going to be, no matter the situation, they will inevitably say, "I'm casting Magic Missile." (Dead Alewives, 1996). In the comedy sketch they take the joke to an absurd level when the character of Galstaff, Sorcerer of Light, finds himself in a cave. For his first action he casts Magic Missile and announces "I'm attacking the darkness!" While Galstaff's decision to attack the darkness may be part of a comedy routine it still highlights the ingenuity of the player and their willingness to take a risk. How many of us would think to solve the problem of a dark cave with a spell, the description of which in the Dungeons and Dragons Player's Handbook includes an image of a man throwing what appears to be a sparkling ball of electricity (Gygax & Arneson, 1974)?

Literature Review

The topic of digital role-playing games (DRPGs) and their effect on creative thinking is one that is at the periphery of current research. Research on games and learning is well documented as is research on creativity and learning. Games, especially digital games, and creativity is a more recent topic of inquiry. While games scholars sometimes touch on creativity in their writing, it is often in reference to creative thinking or problem solving skills as a component of learning. Art education researchers talk about video games in the frame of visual culture and their possible value in the study of art

education from a social viewpoint. Closing this thematic gap in the available research involved looking at creativity, art education and game research for instances where the available information aligned. DRPGs, being a subset of role-playing games as well as digital games required scrutiny through both the lens of a games researcher and a creativity researcher.

Creativity Defined - Creativity has been a topic of research since the early 1960s and of intense debate for longer than that. As recently as 1962 it was still believed that creativity wasn't clearly distinct from intelligence (Runko, 2006). It wasn't until 1965 that Wallach and Kogan completed testing that would become the Wallach-Kogan Creativity Test, and found IQ and GPA to be separate from divergent and original thinking (Runko, 2006). There is no consensus on a comprehensive definition for creativity and the closest definitions are highly dependent on context. In order to determine what impact DRPGs have on creative thinking it is vital that a comprehensive definition of creativity be established. The chosen definition is equally important for determining the role of art education in the framework we are attempting to create.

International leader in creativity research Dr. E. Paul Torrence is known for developing the Torrence Test of Creative Thinking, one of the most widely used measures of creative thinking in the field (University of Georgia, n.d.). Torrence defined creativity as

> a process of becoming sensitive to problems, deficiencies, gaps in knowledge,
>
> missing elements, disharmonies, and so on; identifying the difficulty; searching
>
> for solutions, making guesses, or formulating hypotheses about the deficiencies;

testing and retesting these hypotheses and possibly modifying and retesting them;

and finally communicating the results (Torrence, 1966, pg. 6).

The Torrence test is used as one of several measures to identify gifted learners. It has also

provided evidence that levels of creativity can be measured and then increased through

practice (Childs, 2003). Two preceding studies, which will be discussed later in this

literature review, on the impact of video games on creative thinking both used the

Torrence test as their measurement system. There is some debate over the validity of the

test in the context of measuring creativity. The Torrance test has many components and

guidelines for assessment and it is difficult to analyze if they have been administered

correctly. There is also some question as to whether the test adequately separates

creativity and intelligence and if it has an element of racial or socio-economic bias. The

two studies discussed take different stances on these issues of validity yet both maintain

that their results are accurate.

If three creativity researchers were asked to define the term they might respond

with three different definitions. This lack of a standardized definition results in difficulty

within the field of study and a great deal of conflicting information. When looking at

sample articles from the *Creativity Research Journal* and the *Journal of Creative*

Behavior only 40% were found to explicitly define creativity (Plucker & Beghetto, 2004).

Torrence's highly subject-specific definition is stated in the paragraph above. Ken

Robinson simplified the varied answers down to "The process of developing original

ideas that have value." (Robinson, 2011, pg. 2-3). This, while straightforward and easy to

understand, fails to give context to the words "original" and "value". It does not tell the

reader what qualifies as original. Is it original to the creator or to the world as a whole? What gives an idea value and who is it valuable to?

Educational psychologists and creativity researchers Jonathan A. Plucker and Ronald A. Beghetto define creativity from a social viewpoint as "the interplay between ability and process by which an individual or group produces an outcome or product that is both novel and useful as defined within some social context." (Plucker, & Beghetto, 2004, "Creativity Defined", para. 2). For the purpose of this paper, this is the definition of creativity that best aligns with the topic of inquiry. This should be paired with Gardner's definition of a creative person as someone who "regularly solves problems, fashions products, or defines new questions in a domain in a way that is initially considered novel but that ultimately comes to be accepted in a particular cultural setting." (Gardner, 1993, pg. 35).

Gardner says that 10 years of focused inquiry leads to creativity in a specific domain. (Gardner, 2006). "Those youngsters who are (and who feel) marginal, within their culture, those who are ambitious and stubborn, those who can ignore criticism and stick to their guns are 'at risk' for a creative life." (Gardner, 2006, pg. 47). This is a narrow view of what might lead to creativity. Others such as Lubart and Guignard offer the following personality traits and circumstances as leading to creativity,

> Creativity-relevant personality attributes include perseverance, willingness to take
> risks, willingness to tolerate ambiguity, openness to new experiences, and
> individuality. The motivation for creativity may be either intrinsic or extrinsic as
> long as the motivator energizes a person to work and allows the person to keep his

or her   attention focused on the task. Finally, the environment is considered a

resource for creativity because it can provide physical or social stimulation to help

generate ideas and to nurture these ideas. The environment additionally evaluates

creativity through social judgment (Lubart & Guignard, 2004, "What attributes

lead to Creativity", para. 3).

These traits are closely related to the skills that are believed to be taught by video games

and in fact perseverance, willingness to take risks, willingness to tolerate ambiguity,

openness to new experiences, and individuality are all reliably found in gamers

(McGonigal, 2006; Prensky, 2001; Gee, 2007; Annetta, 2008; Ott and Pozzi, 2012).

Using Plucker and Beghetto's definition of creativity allows a comprehensive

understanding of the topic in a social context by including the designation "person or

group" as well as "within some social context" This is important to the study of DRPG

video games and creative thinking because many DRPGs are, by nature, social

environments. The role of social identity in DRPGs is discussed in depth later in this

literature review but it is important to note that a persons chosen identity and the ability

to think in the context of that identity is believed to be a large part of what allows mastery

in different domains of learning.

Creativity and Domains of Learning - Within the definition of creativity and the

traits it encourages must be a discussion of domains and their relationship to art. Gardner

speaks of ten years of inquiry in a specific domain leading to creativity. A domain being,

"any kind of organized activity within a society, in which one can readily array

individuals in terms of expertise." (Gardner, 2006, pg. 31). Baer calls it, "The set of

representations that underlie and support thinking in a specific area of knowledge; also, any specific area of knowledge, such as art, literature, history, or astronomy." (Baer, 1999, pg. 591). Examples of domains could include any occupation or role found in society such as horticulture, guitar performance or role-playing video games. Though possibly not the clearest definition for the digital generation, as Gardner defines them, "The domains in a society can be thought of as the kinds of roles listed in the Yellow Pages of a phone book—anything from accounting to zoology." (Gardner, 2006, pg. 31).

When speaking of domains and creativity it is important to include the discussion of whether creativity is domain-specific or domain-general. For many years the general assumption was towards domain generality which says, if a skill is learned in one domain, that knowledge can then be translated across all other domains (Baer, 2011). For creativity, this means that if you complete a task in one domain that improves your divergent thinking skills, your divergent thinking skills should improve across any other domain they are used in. Domain specificity, according to Baer, is "a theory that argues that the skills, traits, or knowledge that underlie creative performance in a given domain are largely unrelated to the skills, traits, or knowledge that underlie creative performance in other domains." (Baer, 1999, pg. 591). In other words, the skills for creative thought you learn in the ceramics studio are not going to transfer to photography, because the two are not part of the same domain.

The debate between proponents of domain specificity and proponents of domain generality has gone back and forth since the concept was first introduced in the late 1980s (Baer, 1998, 2011; Plucker & Beghetto, 2004). Baer, who first published on the domain-

specificity of creativity in 1993, narrowed the concept further by proposing that not only is creativity domain-specific, it is also task-specific. This means that just because the task you have completed has improved your skills in creative writing, does not mean you will also improve your poetry writing skills. While writing is a domain, creative writing and poetry are what some call micro-domains or task-specific (Baer, 1998). The issue some find with domain-specificity is that it does not account for important theoretical and methodological issues such as the the definition of creativity used in some key studies (Plucker & Beghetto, 2004).

These issues are important when discussing the question of role-playing video games and their effect on creative thinking across domains. If Baer is believed to be correct there could be no impact of creative thinking skills learned in DRPGs when they are applied to other subjects. However, while the question has not been definitively settled, Plucker and Beghetto propose a solution to the debate. As they see it, the problem lies in the way, or lack thereof, creativity has sometimes been defined for research. To prevent this they propose their own definition, saying that creativity, "is the interplay between ability and process by which an individual or group produces an outcome or product that is both novel and useful as defined within some social context." (Plucker & Beghetto, 2004, "Creativity Defined", para. 2). The "interplay between ability and process, observable outcome or product, novelty and usefulness, and social context" (Ibid.) that they describe has been observed to have both domain-general and domain-specific elements. They say that while some components of creativity may in fact be domain specific, others are domain general and the amount of each changes as a

person develops into adulthood. Their belief is that too much training with the assumption of generality leads to a lack of depth in study, which will hinder creativity. Too much study in a specific domain or micro-domain leads to stagnation. "The optimal condition for creative production is a flexible position somewhere between generality and specificity." (Plucker & Beghetto, 2004).

The division Plucker and Beghetto (2004) are referring to between domain specificity and generality is in the difference between what is know as "big C" and "little c" creativity. Big C creativity, according Karen Kersting (2014), staff writer for the *Monitor on Psychology*, "occurs when a person solves a problem or creates an object that has a major impact on how other people think, feel and live their lives." Little c, on the other hand, "includes everyday problem-solving and the ability to adapt to change." (pg. 40). While big C creativity is quite possibly domain-specific, little c creativity is considered to be domain-general.

Gardner (2006) states that "creativity in physics turns out to be quite different from creativity in poetry" pointing toward a domain-specificity of creativity (pg. 67). Yet in the same paragraph he also states that "Generalizations about creativity are destined to be weak." As mentioned before Gardner believes that domain mastery occurs after 10 years of study in a domain, and that creativity can not occur until this has taken place. The creativity he is defining in this context is big C creativity. While he agrees that little c creativity exists he argues that it is not able to effect a domain beyond a minimal amount (Gardner, 1999). Interestingly, Gardner also lists traits commonly seen in "aspiring creators" including

- Early exposure to other people who are comfortable with taking chances and

  who do not easily admit failure. (It helps to be born in Renaissance Florence, for

  example.)

- The opportunity to excel in at least one pursuit when young.

- Sufficient discipline so that a domain can be more or less mastered in youth.

- An environment that constantly stretches the young person, so that triumph

  remains within grasp without being too easily achieved.

- Peers who also are willing to experiment and who are not deterred by failure.

- Late birth order or an unusual family configuration that encourages or at least

  tolerates rebellion.

- Some kind of physical, psychic, or social obstacle or anomaly that makes a

  person marginal within his or her group (1999, pg. 121).

Many of these traits, much like the ones listed by Lubart & Guignard (2004) and

discussed previously, are also commonly seen in gamers such as "perseverance,

willingness to take risks, willingness to tolerate ambiguity, openness to new experiences,

and individuality." ("What attributes lead to Creativity", para. 3).

Based on the chosen definitions of creativity, and taking into account the skills

shown to be present in gamers, it is likely that many of the skills that lead to creative

thinking learned during video game play fall into the category of little c creativity with

the potential for crossover to big C creativity in certain situations. Zimmerman (2009)

makes a valid closing argument to the debate, saying,

"It would not be productive in art education to adopt the point of view that

children and students cannot be viewed as being creative. Then, there would be no

reason to include any concepts related to creativity and creative behaviors in art

education theory or practice." ("Definitions of Creativity", para. 4).

Taking all of the various opinions and theories into account, the most logical course of

action in the field of art education is to leave the question of domain generality verses

domain specificity unanswered. This allows art educators to work under the assumption

that both are true.

Creativity and Social Identity - The elements that form identity can encompass

a multitude of concepts. A human beings identity can include their, racial identity, gender

identity, social identity, creative identity, and more. Throughout history artists of every

ability level, in every medium, have created works that explore their own understanding

of identity. Researchers in art education, psychology, and even business have discussed

the theories behind the exploration of different identities through art. More recently

games researchers have begun adding to the body of research on the topic, discussing

identity in games of all genres and formats.

Most everyone can identify elements of their own personal identity, be it their

culture, their race, their occupation or their skill set. Someone who regularly creates art

might identify themselves as an artist or creative. Someone who play video games on a

regular basis might identify as a gamer. Jaussi, Randel, & Dionne (2007) say that

creativity is "largely dependent on an individual's intrinsic motivation to be

creative." (pg. 249) and also that people are most often motivated by the the identities

they hold important (Jaussi, Randel, & Dionne, 2007). Therefore if those importantly

viewed identities are creative, such as the identity of an artist, it can be reasoned that they will have a positive impact on that persons creativity.

There are many ways identity can be described as shown by Schwartz, et al. (2011),In scholarly work, the term "identity" has been used to refer to many different things — referents as diverse as people's internal meaning systems (Marcia, 1966; Schwartz, 2001), characteristics and attachments conferred through group memberships (Brown, 2000; Tajfel & Turner, 1986), nationalism (Schildkraut, 2007), positions taken in conversations (Bamberg, 2006), and social–historical currents in belief systems (Burkitt, 2004) (Schwartz, et al., 2011, pg. 2).

An example of an identity that revolves around art and visual culture is that of the Fan-Artist described by Marjorie Cohee Manifold of Indiana University. Fan-Artists are defined as people, typically teens and young adults, who create both artwork and costumes based on characters from popular culture. Japanese manga (comic books) or anime (cartoons) and video games as well as American comics, TV shows, movies, and video games are the main source of material for these artists. They create diverse artwork based on the characters and share it on the internet or at fan conventions. Their work ranges from drawing to costume making (cosplay) to fan-made music videos. A fan-artist for example, may feel an attachment to the fantasy characters of the Japanese DRPG *Kingdom Hearts* and create innumerable works based on them, yet using their own style of drawing. A fan who cosplays may create a costume based on one of the same characters while striving to make every detail as accurate as possible from the clothing to the props and hairstyle. According to Manifold (2009) these fans develop identities as

artists through self-efficacy or the ability to envision oneself as an artist. She also

describes factors, according to Au (2007), that make students want to continue creating

art as,

> curiosity about an interesting subject; the challenge of engaging in difficult art
>
> learning tasks; involvement in an intrinsically pleasant task; personal status or
>
> importance gained from being perceived as competent; public recognition for
>
> one's successes in art; desire to compete against and outperform others; social
>
> interaction; and support from family, school, and friends (Manifold, 2009, pg.
>
> 260).

All of these factors are found in the fan-artists and lead to a continued identity as an artist

who create works based off of visual culture.

This paper will use the term identity as defined by Schwartz, et al. (2011).

"Identity consists of the confluence of the person's self-chosen or ascribed commitments,

personal characteristics, and beliefs about [themselves]; roles and positions in relation to

significant others; and [their] membership in social groups and categories." (pg. 4).

There are three different aspects of identity that are we need to be aware of when

looking at the relationship between creativity and identity as defined by Schwartz, et al.

(2011). They are, individual or personal identity, relational identity, and collective

identity. "*Individual* or *Personal identity* involves the self-definition of a person. . .

Relational identity refers to one's roles vis-à- vis other people . . . *Collective identity*

refers to people's identification with the groups and social categories to which they

belong" (Schwartz, et al., 2011, pg. 3). We can see from Manifold's explanation of what

makes students want to continue making art, as well as the concept that creativity is based

on a persons intrinsic motivation to have a creative identity, that creativity is inextricably tied to identity.

Returning to the discussion of domains, within the field of identity studies there is a question of whether a person has a singular identity or is able to take on identities in multiple domains. "Within the social identity tradition (Tajfel & Turner, 1986), individuals are considered to have multiple group identities that may shift in salience depending on features of the intergroup context." (Schwartz, et al., 2011, pg. 5-6). The ability to take on identities in multiple domains and use those identities to build skills in different domains, such as creativity, is a concept that can be found in research from creativity, to education and art education, to games studies. The building of identities as a tool for learning is highly relevant to James Paul Gee's (2007) discussion of semiotic domains and learning across domains as it relates to video games.

Creativity and Learning - Leading scholars on creativity and education maintain that the inclusion of creativity in our schools curriculums is vital to the future success of our educational system. In 1953 Manuel Barken put forth 6 prepositions about creativity for a conference funded by the Humanities Division of the Rockefeller Foundation, the fourth preposition being, "the function of art education is to 'provide opportunities for creative experience;'" (Hausman, 2010). Teaching for creativity as a function of art education fell out of favor in the 1980s with the advent of Discipline-Based Arts Education. However in 2010 the journal *Art Education* published an issue with creativity as it's theme and received more than 40 submissions (Zimmerman, 2010). The following year the theme of the 2011 NAEA National Conference was, *Creativity, Imagination and*

Innovation in Art Education. Despite a movement away from creativity as a component of art education in the 80s and 90s, the pendulum has swung back to a growing understanding of its importance. This section will address just what creativity has to offer education as well as art education and how they are inextricably tied, as well as four myths that hurt the study of creativity.

There are some naysayers of including creativity as a component of education. Robinson (2011) believes they are worried that creativity and focused effort are mutually exclusive. He argues against this, saying that creativity is not only about having fun, but also about working in a highly focused way and making critical judgements about ideas (Robinson, 2011). He maintains that creativity is the missing piece in a failing system of education.

The concept that learning must be painful and that you must be suffering to get results, seems to be a long held belief of the American school system. The current system for education in much of the world was developed during the industrial revolution to train workers for jobs in industrial production. "They emphasize linearity, conformity, and standardization." (Robinson, 2011, pg. 8). In other words they were teaching students to follow directions and memorize information quickly and en mass. While this may have been successful in the past, Robinson says that in todays fast-paced global economy we need to think differently about education and what we are trying to accomplish.

Since 2010 forty-three states, the District of Columbia and four territories have adopted the Common Core State Standards for language arts and math. The stated goal of

these standards is "developing the critical-thinking, problem-solving, and analytical skills students will need to be successful." (Common Core State Standards Institute, 2014).

Like any new policy there are both proponents and detractors. The skeptics argue that the core standards are still much too focused on teaching to the standardized tests. "One of the roles of education is to awaken and develop . . . powers of creativity. Unfortunately, what we have is a culture of standardization." (Robinson, 2013, TED Talk). Robinson's issue seems to be with the standardized test based assessment system and not necessarily the core standards themselves. The texts for assessing the common core standards are projected to take between 8 and 10 hours for students to complete (Gewertz, 2013). Robinson agrees that standardized tests are a useful tool, but maintains that they should not be used as an exclusive form of assessment.

There is not yet a consensus on the long term viability of the standards. Due to campaigning by opponents, five states are in the process of repealing the national core standards and implementing their own state standards for education. National Coalition for Core Arts Standards, a part of the National Art Education Association, is creating a set of art education standards that can work with the core standards to support them while also advancing the importance of art education.

The National Core Arts Standards are to be framed in the concepts put forth by Grant Wiggins and Jay McTighe in Understanding by Design ("NCCAS Writing Teams", n.d.). Understanding by Design uses the concept of backwards design, starting with an Enduring Understanding or goal, creating essential questions from that understanding. The essential questions are then used to build the lesson (Wiggins, 2005). Their aim is to

"stimulate thought, to provoke inquiry, and to spark more questions—including thoughtful student questions—not just pat answers." (NCCAS, 2014). They believe that the thought, inquiry and questions created in this type of environment are what will drive creative practices, especially creative practices that will inform other subjects and future lines of inquiry.

> The fundamental creative practices of imagination, investigation, construction, and reflection, which are essential in the arts but equally important for science and mathematics learning, are cognitive processes by which students not only learn within an individual discipline but also transfer their knowledge, skill, and habits to other contexts and settings (NCCAS, 2014, pg. 19).

The National standards say that these four practices are transferable between art and other domains. They also say that these practices "nurture curiosity, creativity and innovation, critical thinking and problem solving, communication, and collaboration" (NCCAS, 2014, pg. 19). The fact that these are believed to be transferable across domains is another piece of evidence for the transferability of creativity in general.

In Robinson's opinion, when teaching for creativity teachers should aim to, "encourage self-confidence, independence of mind, and the capacity to think for oneself." (Robinson, 2011, pg. 270). This is very similar to the stated mission of the core standards. He lists the things teachers should try to achieve in teaching for creativity. "[They] should aim to,

- promote experiment and inquiry and a willingness to make mistakes,

- encourage generative thought, free from immediate criticism,

- encourage the expression of personal ideas and feelings,

- convey an understanding of phases in creative work and the need for time,

- develop an awareness of the roles of intuition and aesthetic processes,

- encourage students to play with ideas and conjecture about possibilities,

- facilitate critical evaluation of ideas." (Robinson, 2011, pg. 270).

Giving students the skills they need to think for themselves and create new ideas, instead of the standard tell/test and rote memorization, is what Robinson believes will create the new generation of "Untouchables", a term borrowed from Thomas Friedman to describe, "Those who have the ability to imagine new services and new opportunities and new ways to recruit work." (Robinson, 2011, pg. 11).

Once again, it is believed that teaching for growth in creative thinking is important to art education. "A model of creativity for the visual arts that is inclusive, rather than exclusive, and views creativity as possessed by all people, not just an elite, is one that should be encouraged." (Zimmerman, 2009). Art education cannot succumb to the belief that creativity does not transfer across domains or it will become irrelevant.

Torrance also strongly believed that it was possible to strengthen creative thinking skills and worked to develop methods of doing this in the classroom.

[Torrance] reviewed 142 studies describing efforts to teach creativity, and he concluded that various creativity enhancement exercises did increase student creativity within educational settings, including those associated with divergent thinking, training in the Creative Problem Solving model, being trained in

creative art or writing, the importance of sustaining a creative climate, and using

various workbooks or programs (Plucker, Waltman, and Harley, 2011).

Robinson too advocates strongly for creativity as a skill that should be taught.

Intelligence is diverse, dynamic and distinct. So too is the creative process. It can

operate in the many diverse fields of human intelligence, it is about making

dynamic connections, and the results are always in some way unique. Creativity is

not a single power that people simply have or do not have. It involves many

different mental functions, combinations of skills and personal attributes. We all

have creative capacities but very many people conclude that they are not creative,

when in truth they have never learnt and practiced what is involved (Robinson,

2011, pg. 165).

Unfortunately, some long held beliefs seem to be working against the inclusion of

creativity in learning. Plucker, Beghetto, and Dow (2004) created a list of what they call

the "four persistent myths" that hurt the study of creativity. They are that people are born

creative or uncreative; creativity is intertwined with negative aspects of psychology and

society; creativity is a soft, fuzzy construct; and creativity is enhanced in a group.

Being creative does usually involve playing with ideas and having fun; enjoyment

and imagination. But creativity is also about working in a highly focused way on

ideas and project, crafting them into their best forms and making critical

judgments along the way about which works best and why (Robinson, 2011, pg.

5).

Only a greater understanding of the benefits of training students in creativity will counter these myths and prevent them from preemptively sabotaging the efforts of art educators. If art educators can continue the practice of teaching to develop the skills of creative thinking, promoting the ability to work in a highly focused way and making judgments about ideas, the benefits of creative thinking far outweigh the possibility that it wont be effective.

Games and Learning - The origin of games, and dice games in particular, is said to have occurred in the ancient Kingdom of Lydia. As the story goes, Lydia was in the midst of a famine with no end in sight. The King of Lydia decreed that his subjects, in order to have enough food to go around, would on one day eat, and the next they would play games to distract themselves from their hunger. The following day, they would eat again. They played games using dice and knucklebones and were able to pass 18 years alternating between days of food and days of games. The games were able to command their attention so thoroughly that they didn't think about being hungry, something many a digital gamer can attest to (Crabben, 2012; Zichermann, 2011).

The philosopher Bernard Suits (1978) defines games quite simply and evocatively as, "the voluntary attempt to overcome unnecessary obstacles." (pg. 38). In order to discuss the connections between games and learning it is necessary to first define what makes a game a game. What elements must be present to differentiate a game from other parts of play such as simulations or in some cases even toys? Once these elements have been identified we can determine what it is about games that make them possible situations for learning and how those situations can be harnessed. We will also identify

where there is a possibility for games to teach the same creative thinking skills discussed in the previous section.

According to Prensky (2001), there are "six key structural elements of games: rules, goals and objectives, outcomes and feedback, conflict/competition/challenge/ opposition, interaction, [and]representation or story." (pg. 119). Although there are millions of different kinds of games, the majority of them contain these elements. The first three elements are the classic, commonly accepted definition of a game. The next three "are usually thought of as part of the structure of a game—or at least part of the structure of a computer game—by many game designers." (pg. 122). Interactive activities that fall outside of the category of games include toys, simulations, stories and tools (pg. 125-127). Jane McGonigal (2011), has a similar list of categories. Her *Four Defining Traits of a Game* include: a goal, rules, a feedback system, and voluntary participation.

The first element, agreed upon by Prensky and McGonigal, that differentiates games from other types of play is that all games have rules. "The most basic definition of a game is that of *organized play,* that is to say rule-based." (Prensky, 2001, pg. 119). Children and adults both will spend a great deal of time arguing or debating the rules of the game, sometimes to the point that the playing of the game itself becomes secondary. "Rules impose limits—they force us to take specific paths to reach goals and ensure that all players take the same path." (lbid.). At the same time it is fair to say that rules in many games are there to tell the player which paths are off limits, more than they are to tell players which paths to take. Either way, the rules are vital to productive play of a game. Developmental psychologist Lev Vygotsky (1978) says that, "there is no such thing as

play without rules." McGonigal (2011) says, "rules push players to explore previously uncharted possibility spaces. They *unleash creativity* and *foster strategic thinking.*" (pg. 21). The idea that rules promote creative and strategic thinking ties back to the concept that games can be used to enhance creativity. Rules force a player to find new, less straightforward ways to solve a games problems. A good game makes the player work to find the proper path to their goal.

Second in Prensky's (2001) list is *goals or objectives*. "In a game, achieving your goals is a big piece of what motivates you." (pg. 120). McGonigal (2011) lists *a goal* as the first defining trait of a game. A goal can be many things and doesn't have to include the concept of "winning". It is, "the specific outcome that players will work to achieve." (McGonigal, 2011, pg. 21). Goals are what give some games their purpose. Especially games that don't have a clear cut ending place or a definitive winner. "Winning isn't the goal in a game like *World of Warcraft*. You can become more powerful, but even the most powerful player in the game at any point in time isn't the winner." (Shaffer, 2006, pg. 22). In a game, like *World of Warcraft,* a goal or objective is anything you can "measure yourself against." (Prensky, 2001, pg. 120). "The goal provides players with a *sense of purpose*." (McGonigal, 2011, pg. 21). A goal could be anything from achieving a higher level to collecting enough money to buy better armor for your character.

"*Outcomes and feedback* are how you measure your progress against the goals." (Prensky, 2001, pg. 121). McGonigal (2011) describes a feedback system that can "tell players how close they are to achieving [their] goal." (pg. 21). Feedback can take

many forms. It can be points, a score, or levels (McGonigal, 2011). It can be an outside referee, other players, or the computer. "It is from the feedback in a game that *learning* takes place. . . . Via feedback you get rewarded for mastering something, or you get word that you have failed at something, and have to try again or seek help, until you do it." (Prensky, 2001, pg. 121). Without feedback players would not be able to grow and adapt to game play or learn just what it is that made their attempts successful. In some games they wouldn't know they had been successful at all without feedback from a judge, other players or coaches, or from the game itself.

McGonigal (2011) includes a fourth trait in her list of the four defining traits of a game that she calls voluntary participation, which "requires that everyone who is playing the game knowingly and willingly accepts the goal, the rules, and the feedback." (pg. 21). Voluntary participation is important because it allows everyone involved in the game to feel safe and secure in their playing (McGonigal, 2011). Feeling safe in a game is what lets players experiment, take risks, and make decisions. This phenomenon is called risk-taking behavior and it is extremely important to the type of learning that takes place in a game. Willingness to take risks is also one of the creativity-relevant personality attributes as listed by Lubart & Guignard (2004) and agreed upon by Gee, McGonigal and others. This lends validity to the idea that games can be a source of creativity relevant skills.

While Prensky (2001) includes three more structural factors in his definition, conflict, interaction, and representation, he considers those to be more applicable to computer games than to games as a general concept (pg. 122). While they are found in some other games they are more reliably seen in digital games with a bias towards multi-

player digital games. McGonigal (2011) states that everything beyond the four traits of a game she describes, "is an effort to reinforce and enhance [those] four core elements." (pg. 21).

With a solid understanding of what games are we are able to turn the discussion to how games can be used for learning as well as discuss the use of games in art education.

Video Games in Learning and Art. Many students are led to believe that elements of visual culture such as video games are outside of their purview of study (Hicks, 2004). If learning, both within the arts as well as outside of them is going to be relevant to students, they have to be able to connect it to their lives. Video games as a form of visual culture are a huge part of their experiences as shown by the growing number of students who play them.

"Johnson (2005) believed that gaming is both cognitive and physiological in nature. He described the gaming process as one that requires gamers to undertake a variety of complex learning tasks in order to get to the next level." (Parks, 2008, pg. 237).

Malcolm Gladwell talks in his book *Outliers* about the "10,000 Hour Rule" of success which states that it takes 10,000 hours of study or practice to achieve mastery in a field. Gladwell studied the lives of extremely successful people to see what it was there were doing differently from everyone else. What he found was that, on average, they dedicated 10,000 hours to their study or practice before they were considered to have achieved mastery (Gladwell, 2008). While time spent is not the only factor involved, there is also an element of innate talent, it does open the debate to ask how the theory of 10,000 hours can be applied across domains (Baer, 2014).

Jane McGonigal speaks about the parallel track of education that todays video game players engage in. By the age of 21 they have spent an equal amount of time playing computer games as they did in school between 5th and 12th grade. Gamers in 2010 spent 3 billion hours per week playing online games. World of Warcraft players, as of 2010, had spend a collective 5.93 million years in the virtual world of Azeroth (McGonigal, 2010). 10,000 hours has also been calculated as approximately 10 years (Hayes, 1989; Zichermann, 2011). This mean that many players of WoW, which was released in 2004, are currently approaching the 10 year/10,000 hour milestone. McGonigal's question is, in the 10,000 hours that gamers are spending playing video games, "what exactly are they getting good at?" (McGonigal, 2010, 8:06).

Video games, by their nature, must be designed to be the ideal learning experience. They have to draw the player in, make them want to stay, teach them how to play and present them with challenges that are just difficult enough without being unobtainable, keeping the player moving forward and having fun at the same time (Gee, 2007). The best games do this without the player realizing they are being taught. If video game designers didn't teach their audience how to play, they would go out of business because they wouldn't make any money (Gee, 2007). The learning in these games is, by design, invisible. It's doubtful a gamer would list teaching style as something they were aware of in a particular game.

> When we think of games we think of fun. When we think of learning we think of work. Games show us this is wrong. They trigger deep learning that is itself part and parcel of the fun. It is what makes good games deep (Gee, 2004, pg. 23).

Put another way, "A game is designed by a set of problems and how you're going to solve those problems. Since you're selling problem solving, you have to be able to teach people to solve the problems." (Gee, 2012).

Prensky's (2001) "six key structural elements of games: rules, goals and objectives, outcomes and feedback, conflict/competition/challenge/opposition, interaction, representation or story" (pg. 119). are comprised of the same elements that make up digital games. He states that one thing digital games do well is take care of the rules and details so the player doesn't have to spend time figuring them out. Time that they could be spending enjoying the game. He lists many other potential reasons that digital games are so popular including but not limited to:

> digital games take care of the boring stuff; digital games are faster and more responsive; digital games are capable of more, better and far more varied graphic representations; the whole world is available as a potential player; digital games can be played at differing levels of challenge; and digital games can be customized to and by the desires of each player." (Prensky, 2001, pg. 128-129).

Gamers consider their activities "games", even when the task is boring or repetitive. Many types of games involve what is known as leveling, building your character's skills and abilities to a certain level so that you may continue on in your quest to the next, more powerful, enemy (Shaffer, 2006, pg. 22). One example is in the adventure game *Kingdom Hearts* which requires the player to participate in many hours of tournament style fighting to gain the experience necessary to move on to the final

stages of the game. Despite many a player complaining about leveling or, to use a more evocative term, level grinding, it is still thought of as "playing" the game.

What is it about digital games that keeps players level grinding for hours or days in the DRPG Final Fantasy VIII or in WoW? Recently, a player of the WoW expansion World of Warcraft: Mists of Pandaria, known by the in-game name Doubleagent, succeeded in reaching the level 90 experience cap without choosing a side (Stickney, 2014).

One of the main components of WoW is that all players are required to choose a race. Each race is assigned to either the Alliance faction or the opposing side know as the Horde. Throughout your time in the game world your quests, allies and enemies are guided by the side you chose. When WoW introduced the Mists of Pandaria expansion to the online universe it included a race from an isolated island called the Pandaren. Once a player levels their Pandaren to level 12 they are allowed to leave the island and venture out into the rest of the WoW universe. At this time they are forced to choose a side between the Horde and Alliance. Doubleagent made the choice to remain a neutral character, which means he is unable to leave the small island. He took it as a personal challenge to reach the level 90 cap as a neutral character. To do this he spent over 170 days of in-game time mining ore and gathering herbs which slowly built up his experience points, allowing him to climb levels. It took him over 2 years in real world time to accomplish this. When asked by journalist Nick Wilson about his goals for the future Doubleagent, who has several other characters in WoW that are assigned factions, said, "I won't be picking a faction. I do intend to level to 100 come the next expansion. If

for some reason I cannot level any higher, I will park Doubleagent there forever at 90." (Wilson, 2014).

Mining and gathering herbs in WoW falls firmly into the category of level grinding, being a very repetitive task that builds your experience points slowly. While Doubleagent's accomplishment is not common, in fact it garnered more than 20 articles in online magazines when he finally reached level 90, it is a fascinating aspect of the game world. The desire for the incremental reward of increasing levels is so attractive that players are willing to spend hours and days to achieve it. This type of leveling is an extreme example of the type of dedication games can engender.

McGonigal (2010) has created a list of four things that she believes gamers are developing by playing video games. The first is Urgent Optimism, defined as "the desire to act immediately to tackle an obstacle, combined with the belief that we have a reasonable hope of success." The next is Social Fabric. Research shows that, "playing a game together actually builds up bonds and trust and cooperation. And we actually build stronger social relationships as a result." Third is Blissful Productivity. "we know, when we're playing a game, that we're actually happier working hard than we are relaxing, or hanging out. We know that we are optimized, as human

beings, to do hard meaningful work. And gamers are willing to work hard all the time, if they're given the right work." The fourth thing gamers are developing is Epic Meaning. "Gamers love to be attached to awe-inspiring missions to human planetary-scale stories." (McGonigal, 2010, TED video).

One important element of Urgent Optimism is the ability it affords gamers to take risks. "Video games create what the psychologist Eric Erickson has called *psychosocial moratorium*--that is, a learning space in which the learner can take risks where real-world consequences are lowered." (Gee, 2007). This psychosocial moratorium allows divergent thinking and problem solving to occur in such a way that the gamer feels optimistic about trying. If their idea doesn't work they can always go back to the last time they saved their game and try something different.

When discussing Social Fabric we need to look at it's connection to learning and creative thinking. Gee (2007) argues that learning "is a matter of being situated in a material, social and cultural world." The Gamer Generation is "very comfortable working with people they've never met. . . never knowing how old they are. . . their background. Its simply what you can produce, and if you're not producing something good than I'll move on to the next person." (Prensky, 2001, pg. 57). "As a result of their connected experience, Games Generation people tend to think differently about how to get information and solve problems." (Prensky, 2001, pg. 58). For many of todays gamers, play is inherently social. Their games are played on-line, in groups or with a team (Gee, 2007). Prensky includes this in what he calls Interaction. Part of interaction is the interaction between the player and the computer, but the other is "the inherently social aspect of games — you do them with other people." (Prensky, 2001, pg. 123). "Gamers generally prefer human competitors, and critics who see computer gaming as an isolating activity, should be aware of this." (lbid.).

In gaming, a large part of the players motivation is achieving goals (Gee, 2007). Players achieve Blissful Productivity by doing hard, meaningful work that leads to achieving goals such as leveling up or defeating a difficult enemy. "Starbuck and Webster boil play down to two common elements 'playful activities *elicit involvement* and *give pleasure.'*" They also point out that, "'Playful tasks foster creativity. If the playful tasks are new ones, they will put much effort into learning them and exploring them, usually trying to control their own learning.'" (Prensky, 2001, pg. 116). Researcher Mihaly Csikszentmihalyi refers to a mental state he calls "flow" during which "problems and your ability to solve them are almost perfectly matched, and you often accomplish things you didn't think you could, along with a great deal of pleasure." (Prensky, 2001, pg. 124). The state of flow is tied closely to McGonigal's (2010) idea of an Epic Win.

"An epic win is an outcome so extraordinarily positive you had no idea it was even possible until you achieved it...When you get there you are shocked to discover what you are truly capable of." (McGonigal, 2010). McGonigal (2010) breaks down the emotions tied to a gamer "on the verge of an epic win" as urgency, fear, concentration, deep focus, optimism and surprise. Epic Meaning is often seen in games where the representation, stated by Prensky (2001) to be the narrative or story, of the game is rooted in fantasy and gives the player the opportunity for world-changing, life-saving accomplishments.

That's not something that we have in real life that easily, this sense that at our fingertips are tons of collaborators. And also there is this epic story, this inspiring story of why we're there, and what we're doing. And then we get all this positive

feedback. You guys have heard of leveling up and plus-one strength, and plus-one

intelligence. We don't get that kind of constant feedback in real life (McGonigal,

2010).

One place where the the opportunity for world-changing, life-saving

accomplishments is readily presented is in military service. It is also a profession where

games as a training tools have been embraced and developed whole-heartedly.

The military uses games to train soldiers, sailors, pilots and tank drivers to master

their expensive and sensitive equipment. It uses games to train command teams to

communicate successfully in battle. It uses games to teach mid-level officers how

to employ joint force military doctrine in battle and other situations. . . . It uses

games for teamwork and team training of squads, fire teams, crews, and other

units; games for simulating responses to weapons of mass destruction, and

terrorist incidents, and threats; . . . and it even uses games for teaching how *not to*

fight when helping maintain peace (Prensky, 2001, pg. 296).

"The US Military is the worlds largest spender and user of Digital Game-Based

Learning." (Prensky, 2001, pg. 296). "[They have] embraced Digital Game-Based

Learning with all the fervor of true believers. Why? Because it works for them." (pg.

295).

The acceptance that video games have value both as a form of visual culture and

as a tool for learning allows students to explore them as a medium for learning. While

this acceptance is not pervasive the growing body of research into games and their benefit

to learning is a huge positive step in that direction. Conferences such as the National Art

Education Association's annual conference has had a growing focus on what video games have to offer art educators in recent years ("2010 NAEA National Convention: Art Education and Social Justice," 2010). It's difficult to say is this shift towards video games as a resource to be explored is due to the research being done or because of it. Whichever the cause it is allowing a new focus on video games as a topic of interest for art education.

Semiotic Domains and Epistemic Frames - One major idea of video game playing is that in order to play a game well you have to care about what the game wants you to care about. As Shaffer puts it, "To play any game well, you have to learn to care about the kinds of things that matter in the game. . . . any good game ends up by making you value what you are doing and how you are doing it." (Shaffer, 2006, pg. 123). This is a product of becoming part of the semiotic domain of the game and thinking in terms of the games epistemic frame.

The Merriam-Webster Online Dictionary defines *epistemic* as "of or related to knowledge or knowing"("Epistemic," n.d.). *Epistemology* is "the study or a theory of the nature and grounds of knowledge especially with reference to its limits and validity" (lbid.).

Epistemic frames are a way of thinking about an activity while the domain is the activity itself (Shaffer, 2006; Gee, 2007; Gardner, 2006; Goffman, 1974). For example, in playing WoW you may choose to play as a character from the Elven (elf) race, which would place you in the Alliance faction. You would learn to look at the world through the epistemic frame of an Alliance faction member, seeing the story through your character's

eyes. This would lead you to believe that the Horde characters are the enemy and inform other decisions you make throughout the game. The game itself is your domain and the way your character thinks is your epistemic frame.

"Epistemic games create virtual worlds that push players into dilemmas that can be resolved only by developing the skills, knowledge, epistemology, and values that guide innovative thinking." (Shaffer, 2006, pg. 130).

Gee (2007) combines the ideas of epistemic frames and domains into what he refers to as *Semiotic Domains,* defined as "an area or set of activities where people think, act and value in certain ways" (pg. 19). He lists areas such as video gaming, physics, and bird watching as semiotic domains (pg. 19). He then goes on to explain the difference that occurs when students learn a semiotic domain in an *active* way, rather than as passive content. He believes three things happen:

> We learn to experience (see, feel, and operate on) the world in new ways. Since
>
> Semiotic Domains usually are shared by groups of people who carry them on as
>
> distinctive social practices, we gain the potential to join this social group, to
>
> become affiliated with such kinds of people (even though we may never see all of
>
> them, or any of them, face to face.) We gain resources that prepare us for future
>
> learning and problem solving in the domain and in related domains (Gee, 2007).

While Shaffer (2006) references Gee's (2003) *What video games have to teach us about learning and literacy* in regards to epistemic frames, he is referencing the 2003 version of the book. The 2006 version *What video games have to teach us about learning and literacy* (Revised and updated edition) has no mention of epistemic frames and only

describes semiotic domains. The major difference between the two may be that Gee's semiotic domains identify the individual as part of a group, while Shaffer's epistemic frames refer to the activity the individual is performing without taking the social element into account.

To move from active learning to what Gee (2007) calls critical learning, students need to not only understand and produce meanings in a semiotic domain, they also need "to learn how to think about the domain at a 'meta' level as a complex system of interrelated parts." (Gee, 2007, pg. 25) Perhaps most importantly, "the learner also needs to learn how to innovate in the domain—how to produce meanings that, while recognizable to experts in the domain, are seen as somehow novel or unpredictable." (Ibid.).

Returning to Plucker and Beghetto's (2004) definition of creativity, "the interplay between ability and process by which an *individual or group produces an outcome or product that is both novel and useful as defined within some social context*. [emphasis added]" ("Creativity Defined", para. 2) we can see that by their definition, critical learning in a semiotic domain would qualify as creativity.

Games and Identity - When they are playing games "children are running simulations of worlds they want to learn about in order to understand the rules, roles, and consequences of those worlds." (Shaffer, 2006, pg. 25). "Gee has argued that every game gives players an opportunity to try on new identities." (Shaffer, 2006, pg. 158). Identities in a game are about the relationship between real, virtual, and projective identities. The real identity is

the player, the virtual identity is the character and the projective identity is the kind of character the player wants to be in the game world (Shaffer, 2006).

> If the virtual world and virtual identity at stake in learning are not compelling to the learner, at some level, then little deep learning is libel to occur, in part because the learner is going to be unwilling to put in the effort and practice demanded for mastering the domain (Gee, 2007, pg. 59).

Gee (2007) also describes the Identity Principal of learning which "involves taking on and playing with identities in such a way the the learner has real choices and ample opportunity to meditate on the relationship between new identities and old ones" (pg. 64).

So what do games have to tell us about identity? "Good games offer players identities that trigger a deep investment on the part of the player." (Gee, 2007, 2008, pg. 32).

Video Games as Tools for Education. The American philosopher, psychologist, and educational reformer John Dewey wrote about the power of authentic activities, strongly advocating for an activity-based system of education where students would "learn by doing" (Jackson, P. W., 1998; Shaffer, 2006). "Dewey [looked at] the expert or the specialist in the various domains of knowledge as charting the overall direction in which all formal instruction . . . should eventually move." (Jackson, P. W., 1998). Psychologists Brown and Campione, developers of the Facilitating Communities of Learners curriculum, believe that "learning takes place only as part of a coherent system, and many failed attempts to implement good educational ideas have been the result of seeing what should be a coherent whole as a set of isolated parts." (Shaffer, 2006, pg. 179).

According to Zichermann (2012), game based learning allows players to learn from failing in a low threat, low risk situation. It creates exceptional multi-tasking skills and concentration when players have to chat (voice and text), operate a character, manage short term objectives, manage long term objectives, and manage interruptions all at the same time. Game based learning provides real time feedback and lastly, gaming is immersive and, as Zichermann points out, fun (TEDxKids@Brussels, 2012).

In his presentation to The Games Summit 2012, Gee explained that, "Humans, if given problems that are abstract and with nothing at stake cannot learn well. When things are embedded in a narrative they get it right." He makes the point that knowledge, and more specifically critical learning, if separated from learning within a semiotic domain is more difficult if not impossible to obtain.

> If you focus on facts and information you can teach to the test, but it will   never
>
> correlate to real life. When you focus on teaching the facts as tools to solve the
>
> problem you get problemsolving and fact retention. In games you get the facts for
>
> free (Games Summit 2012, 2012).

Shaffer (2006) posits that computer and video games let people see in new ways.

> Computers make it possible to create virtual worlds and to think and learn by
>
> inhabiting those worlds. The represent a change in thinking on the order of the
>
> development of the printing press, or writing, or even language itself. The new
>
> kinds of games that computers make possible are a form of communication, of
>
> interaction, of play uniquely suited to the high-tech, digital, on-demand and just-

in-time postindustrial world of global competition that information technologies

are creating (pg. 191).

It is vital that we give children the tools to learn the epistemologies of creative

innovation. "Computers are creating a world that places a premium on innovation and

creative thinking, and computer games make it possible to prepare young people for a life

in that world." (Shaffer, 2006, pg. 10).

Digital Games and Creativity - "Gamers are creative, persistent and always up for a

good challenge." (McGonigal, 2011, pg.240). A team from Seattle, WA that included

medical scientists, computer scientists, engineers, and professional game designers

created a protein folding game called *Foldit* (fold.it/portal). "*Foldit* harnesses the real

brain power of gamers, challenging them to use their creativity and ingenuity to fold

digital proteins by hand." (McGonigal, 2011, pg. 241). The game had 112,700 registered

users within 18 months of its release.

In August of 2010 in the scientific journal *Nature*, the team announced that "in a

series of 10 challenges, gamers beat the world's most sophisticated protein-folding

algorithms five times, and drew even three times." (McGonigal, 2011, pg. 241-242). This

is due to the ability of gamers to make intuitive leaps, and take radical creative risks

while a computer program much follow a strict set of guidelines and procedures. The

research team hopes that, "one day Foldit players could design proteins that battle HIV

and other incurable diseases." (Fahey, 2010).

Research into the correlation between video game playing and creative thinking is

in its infancy. At this time there are only two published studies on digital games and

creativity. The first was published in 2009 in the journal of Educational Computing

Research. The study, done by doctoral candidate Karla R. Hamlin looked at 118 fourth

and fifth grade students in an attempt to measure if video games made them more or less

creative. The students completed a survey on their video game playing habits and then

took the Torrance Test. All of the children surveyed played approximately the same

number of hours of video games per week with some deviation. Analysis of the Torrance

test found that the amount of time spent playing video games did not affect the students

scores on the text. However, there was no control group of students that did not play

video games, nor was creativity measured before playing video games and then compared

to a second test after playing video games. Overall the results did not answer any

questions other than, does playing 1 - 3 hours of video games a week made students more

or less creative than playing 4 - 6 hours of video games per week? While this may have

been the first study on video games playing habits and creativity, it does not provide

usable data for this paper due to the lack of a control group.

    The second study was completed by Linda A. Jackson, et al. in 2011. In this study,

from the Children and Technology project, Jackson looked at the relationship between

children's use of information technology and creativity.

    In this research we took an exploratory approach to examining relationships

    between a complex and important concept – creativity, and a variety of

    information technologies, specifically, computers, the Internet, videogames and

    cell phones. Because so little is known about the causes of creativity, and because

    so little is known about the effects of IT use, examining their relationships is an

important first step in understanding both. We were particularly interested in the relationship between videogames playing and creativity because playing videogames has become a core activity in the lives of today's children (Entertainment Software Association (2011) and, most likely, tomorrow's adults (Jackson, L. A. et al., 2011, pg. 2).

The researchers set up a study of 491 twelve year olds and administered the *Torrence Test of Creativity*. Among their findings was that "Correlations between videogame playing and every measure of creativity were significant and positive. . . . No other technology use measure was related to creativity." (Jackson, L. A., et al., 2011, pg. 3). They also found that "videogame playing was related to multiple dimensions of creativity, regardless of the type of videogame played." (Jackson, L. A., et al., 2011, pg. 5).

Within the study they also had children take a survey that asked them to list their favorite video game. This resulted in 205 unique results. The researches broke these results down into the following categories using Wikipedia and other online gaming resources:

(1) Violent videogames. Games in this category include first-person shooter games and games in which violence is at the core of game play. Games named by participants that fell in this category are Zelda and Super Smash Brothers.

(2) Action–adventure videogames. Games in this category typically involve role-playing, strategy and problem-solving to ''win'' the game. Examples of games in this category for our participants are Half-Life 2 and Star Wars.

(3) Racing/driving videogames. Driving and race simulation games fall into this

category. Examples are Need for Speed and Big Mutha Truckers II.

(4) Sports videogames. Games in this category include all types of sports/athletic

games. Among our participants the most popular games in this category were

NBA basketball and NFL football.

(5) Interpersonal videogames. Games that involve interpersonal relationships or

caring for others, humans or non-humans, were included in the category.

Examples from our participant are Sims and Animal Crossing.

(6) Other videogames. Games that did not fit into any or the preceding five

categories were placed in this category. Examples are Parkalline and Spider

Solitaire (Jackson, L. A., et al., 2011, pg. 3).

It is also stated that most of the games could be placed into more than one category, and

that an "alternate categorization scheme might better capture the dimensions of children's

game play that are important to predicting children's outcomes of game play, such as

creativity." (Jackson, L. A., et al., 2011, pg. 3).

The categories selected were similar but not identical to the typical sub-domain

categorization of video games. "Today computer games are generally recognized as

falling into one of eight "genres", which often overlap." (Prensky, 2001, pg. 130).

Prensky (2001) lists these as, action games, adventure games, fighting games, puzzle

games, role-playing games, simulation games, sports games, and strategy games.

Creativity and semiotic domains in video games. Shaffer (2006) says it's

possible to build games that teach players to think creatively. He points to epistemic

games like *Digital Zoo*, a sim that allows the players to become biomechanical engineers and design virtual creatures, as creating micro-worlds that teach experimentation, critical thinking and problem solving. Dewey (1934/1958) and Gardner (1982) agree that "innovation doesn't happen in a vacuum." (Shaffer, 2006, pg. 94).

The definition of a game's virtual world as a semiotic domain leads to the question of whether knowledge and skills from a video game domain can be transferred into other domains. Gee (2007) asks "Can various subdomains in the larger domains of video-game playing serve as a precursor domains facilitating later learning in and out of school?" (pg. 40) After conducting interviews with gamers, who have successfully translated their skills to mastering other semiotic domains, he and his research team have determined that it is possible (Gee, 2007, pg. 40).

> I believe that the sorts of active and critical learning about design—and   the type of problem-solving identities—that a game . . . can involve may well relate to later learning in domains like science, at least when we are talking about teaching and learning science as an active process of inquiry and not the memorization of passive facts (pg. 40).

Dewey (1938) says "Every experience influences in some degree the objective conditions under which further experiences are had (pg. 37)." (Shaffer, 2007, pg. 157).

The ability to transfer creativity across domains may be debated but Plucker and Beghetto's concept of "little c" creativity *is* transferable across domains and "includes everyday problem-solving and the ability to adapt to change." (Kersting, 2014, pg. 40). We know from Prensky (2001) that "Games Generation people tend to think differently

about how to get information and solve problems." (pg. 58). And from Gee, "A game is designed by a set of problems and how you're going to solve those problems. Since you're selling problem solving, you have to be able to teach people to solve the problems." (Gee, 2012). As well as, "Video games create what the psychologist Eric Erickson has called *psychosocial moratorium."* (Gee, 2007). This psychosocial moratorium allows divergent thinking and problem solving to occur in such a way that the gamer feels optimistic about trying (Gee, 2012).

> Fantasy role-playing games are another well-defined subdomain. People who have earlier played and mastered the *Dungeons and Dragons* semiotic domain (as make-believe play or with books and cards) are advantaged when they play fantasy role-playing games, since such games developed out of *Dungeons and Dragons*, though they now contain a good many additional elements (Gee, 2007, pg. 39-40).

Games can teach people to think creatively. This is reinforced by the idea that every experience reenforces the next. If people are experiencing games that force them to think in new ways, using new, problem solving identities, and those identities are that of innovators in a domain it stands to reason that they are learning little-c creativity. This ability to adapt to change, and feel optimistic about trying new things, implies a mental state that is optimal for promoting creativity.

Role-Playing Games - Role-playing games (RPGs) have a history that began long before the World of Warcraft became one of the most played RPGs of all time. In January of 1974 Gary Gygax and Dave Arneson released the very first box set for their table-top

role-playing game *Dungeons and Dragons* (D&D) (Appelcline, 2013). Similar to the world of JRR Tolkien and *Lord of the Rings*, D&D is filled with heros and monsters, elves and orcs, sorcerers and fighters.

Unlike a typical board game, the original D&D box set contains only three books of rules and instructions (Appelcline, 2013). The first book explains how to create your own character from race, to class (job description), to strength and intelligence, to the equipment you will carry. The other two books are for your group's Dungeon Master (DM), a combination storyteller and referee responsible for creating they game and making it run smoothly (Gygax & Arneson, 1974) .Once everyone in the group creates a character, the DM guides them on adventures where they can battle monsters, find treasure and possibly even save the world, all while gathering experience points in the game. Experience points lead to stronger attacks for fighters, more powerful spells for magic users, and enhanced abilities all around. D&D games are referred to as "campaigns" and can span years of weekly game nights if the group is invested enough.

D&D is a table-top game, played with dice, a rule book and the players imaginations. Not all table-top RPGs are fantasy based like D&D. Others commonly encountered include but are not limited to, horror, science fiction, super hero and oriental fantasy. The component they all share is that they game play is discussion based, meaning there is very little acting apart from possibly role-playing a conversation between characters. Players describe their attacks or actions to the DM and then role dice, which are compared to the character's statistics, to find the result of the action.

The distinct subdomains of RPGs include the previously described table-top

RPGs (sometimes called a pen and paper RPGs), live action RPGs (LARP), text-based

RPGs, and digital RPGs (DRPGs) (Harrigan, Wardrip-Fruin, & Crumpton, 2010)

> LARPs follow the same terminology (role play, storytelling, rules, good play) and
>
> require the same in terms of player knowledge prior to game start: a character, the
>
> establishment of a fictional contract detailing the fictional world and how to act in
>
> and with it, and an opening situation (coined *event zero* for LARPs by Emrick,
>
> 2001) (Tychsen, Hitchens, Kavakli, & Brolund, 2006, pg. 254).

The most striking difference between LARPs from other types of RPG is the "live-

action" element wherein players act out the action, often wearing costumes and having

mock battles with foam weapons. (Tychsen, Hitchens, Kavakli, & Brolund, 2006)

Text-based RPGs can take on several formats including a game based format

known as a Multi-user Dungeon, or MUD, that is a precursor to digital RPGs. They can

be play-by-post in forums, chat rooms and mailing lists. Finally, text-based RPGs can be

real time, human moderated games much like a web based version of D&D. (Harrigan,

Wardrip-Fruin, & Crumpton, 2010)

"[Digital] RPGs, like their cousin, the strategy game, are another genre [of RPG]

derived from pen-and-paper games." (Rollins & Adams, 2003, pg. 347).

> [Digital] role-playing games comprise an interestingly diverse genre, ranging
>
> from simple arcade style games such as the Diablo series, to ponderous graphical
>
> adventure style games, such as Anachronox. The two things role-playing games
>
> have in common are as follows: Configurable player-characters that improve with
>
> experience [and] strong storylines (Rollins & Adams, 2003, pg. 347).

Gary Alan Fine, a sociologist and professor at Northwestern University is one of the preeminent researchers on role-playing gaming. The description of fantasy RPGs from his book, *Shared Fantasy* is evocative and accurate to the table-top games he was researching.

> Fantasy gaming is a social world, luxurious in imagination and filled with mysterious delights. This is a world of distant keeps, regal castles, glistening starships, fierce hippogriffs, rainbow dragons, and fiery jewels. It is also a world of dank dungeons, villainous necromancers, green slime, and omnipresent death. It is a world of dreams and nightmares; yet unlike these constructions of our sleeping mind, these worlds are not experienced in a state of reverie or unconsciousness. These worlds are experienced collectively—they are shared fantasies. This shared component raises issues not present in private fantasies (Fine, 1983, pg. 72).

> Other scholars have pointed out, fairly, that "Fine's discussion of the gaming subculture's social and communication network structure predated the emergence of the internet." (Torner & White, 2012). This is especially important in regard to the social aspect of DRPGs. The fan-base is vastly changed from what it was in 1983.

It is important to point out that Fine also recognizes the vast changes that have occurred in the domain since he completed his research.

> If I were doing this research now—and I'd be doing it online—one of the things that's very striking is that when you play World of Warcraft or you play Second

54

Life, the other people who are in your party may come from anywhere around the world (Fine, 2009).

RPG Video Games - The game titles that are considered to fall under the RPG Video Games, or digital role-playing games (DRPGs) umbrella are as varied as the definitions of creativity. In 2001, Prensky offered a definition that is now considered to be outdated.

> Generally some form of Dungeons and Dragons brought to the computer screen. They are mostly mediaeval in their imagery and involve quests, usually to rescue someone of something. You play a character, who has a "type" (human, orc, elf, wizard, etc.) and a set of individual characteristics you assign it. You acquire equipment and experience via action and fighting. Things such as spells are a big deal. The classic example is EverQuest. RPGs are most often played online and with others." (pg 130).

While Prensky's definition fails to include the advances and modification made to the genre since 2001 it is still an important piece of the history of DRPGs. Today, there are many more well known DRPGs, though *Everquest* still holds a strong role historically, such as the 2011 DRPG, *The Elder Scrolls V: Skyrim* for the Xbox 360 console platform. There are also entire subdomains such as Japanese RPGs or JRPGs that includes massively popular titles like *Final Fantasy VII* (as well as the entire *Final Fantasy* series).

While the titles and how they are categorized is varied, there is a general consensus on what a game must include to be considered a DRPG. DRPGs are know for

their strong story lines. Game worlds have detailed history and there is a an overarching plot and goals the player is trying to accomplish. The second necessary feature of a DRPG is the character development. Characters begin the game at a low level with just enough ability to survive. It is up to the player to collect equipment, build strength and skills and determine how they want their character to grow.

Beyond these two basic requirements there are many others found in typical DRPGs such as the ability to customize your character from the ground up, choosing gender, race, class and sometime even facial features. Many DRPGs are "quest based" meaning the player spends a great deal of time completing small missions that may or may not be part of the overarching plot of the game.

Also important to the definition of DRPGs is an explanation of MMORPGs, or Massively Multi-Player Online Role-Playing Games. MMORPGs differ from the traditional single player DRPG in that they can be played by a nearly infinite number of people at one time. *World of Warcraft*, already heavily described in this literature review is an MMORPG. MMORPG characters are created from the ground up much like a D&D character. Players usually join teams or guilds, made up of other players whom they may or may not know in a real world capacity, during the course of game play. Most MMORPGs also consist of open ended game play. There is a plot structure throughout the game world like other RPGs, but the majority of the game is spent on smaller side quests that the player can complete on their own of with their team/guild. Players spend most of their time leveling their characters and interacting with other player-characters inside the game world and not necessarily trying to advance to an "ending" point.

Sarah Lynne Bowman includes the following as her definition of RPGs (which also functions for MMORPGs) "As a preliminary attempt, I have proposed in previous work that all role-playing games include three of the following basic functions: community building, problem solving, and identity alteration." (Bowman, 2012, pg. 32). With the variety of titles currently being marketed as DRPGs, this definition is the most inclusive and contains the elements of an RPG that are important to this research.

RPGs and Identity - Returning to the definition of identity from Schwartz, et al. (2011). "Identity consists of the confluence of the person's self-chosen or ascribed commitments, personal characteristics, and beliefs about [themselves]; roles and positions in relation to significant others; and [their] membership in social groups and categories." (pg. 4). Role-playing games can easily be described as self-chosen commitments. The definition of "game" itself from McGonigal (2011) includes voluntary participation as one of it's key elements. RPGs are based on creating your own character, Bowman's (2012) identity alteration*,* and then participating in the social world and story of the game. We have also already established games as social groups per McGonigal's (2011) social fabric.

Gee (2007) describes the three identities involved when playing his DRPG character Bead Bead as "'James Paul Gee as *Bead Bead.'* where Bead Bead is italicized to indicate that . . . the stress is on the virtual character." This is considered the virtual identity. "'*James Paul Gee* as Bead Bead,' where James Paul Gee is italicized to indicate that, in this identity, the stress is on the real-world character James Paul Gee playing [the game]." This is the real-world identity. The third is identity is "'James Paul Gee *as* Bead Bead' where the word 'as' is italicized to indicate that, in this identity, the stress is on the

interface between . . . the real world person and the virtual character." (pg. 49-50). The

process of switching back and forth between these identities is vital to the concept of

role-play. All three identities are responsible for building the character and all three

become deeply invested in the characters success or failure in the game world.

Role- playing games are "not 'ordinary' or 'real' life. It is rather a stepping out of

'real' life into a temporary sphere of activity with a disposition all of its own (Huizinga

1950:8)" (Williams, Hendricks, & Winkler, 2006, pg. 21).

"'to be creative, a person has to internalize the entire system that makes creativity

possible,' including both knowledge of the domain in which he or she is working and the

professional judgement of the field of people who work in that domain." (Shaffer, 2007,

pg. 95).

> Though less common than standardized social rituals, role-playing games also
>
> manifest as a form of ritual behavior where the rules of reality are temporarily
>
> altered and new ones are established. While some of these roles can become
>
> formalized or standardized -- such as the leadership role of the storyteller/
>
> Gamemaster -- role-playing differs from other more codified social rituals in that
>
> the participants have a remarkable amount of creative control over the
>
> experiences enacted within the (game space). The roles they adopt are often
>
> spontaneous and self-generated, even if participants are enacting a particular
>
> "types" of character that serves a specific purpose. This co-creative capability
>
> provides an almost limitless well of imaginative potential; the only limits are

defined be the rules established by the (game) and the expectations of the player

culture within which these performances take place (Bowman, 2012, pg. 33-34).

Burke and Reitze (1981) describe a "promoted creative identity" as something that might

lead to a person viewing themselves as creative and thus seeking out creative tasks. When

talking about identity and RPGs it is possible that the opportunity for role-playing "new"

identities that is inherent in creating characters would have this same effect.

> we assume that "identities influence the choices made" (p. 91), starting with
>
> whether to begin an activity or not. This is how, for instance, a promoted creative
>
> identity is likely to support a person in his or her choice to initiate creative work,
>
> while a denied creative identity might lead to the opposite. We need to
>
> acknowledge however the fact that both identity and behaviour 'reinforce' each
>
> other and their connection is situated within a complex system of social relations
>
> and meanings that evolves over time, so any views of linear and unidirectional
>
> causality need to be replaced by multiple and dynamic relationships (pg. 18).

The concept that identity and behavior reinforce each other also supports the hypothesis

that DRPGs could be a way to advance "promoted creative identity". As Schwartz (2011)

states, a person chooses their identity by the decisions they make and don't make, the

people they surround themselves with and their beliefs about themselves and others.

> Schwartz, et al. (2011) "Identity consists of the confluence of the person's self-
>
> chosen or ascribed commitments, personal characteristics, and beliefs about [themselves];
>
> roles and positions in relation to significant others; and [their] membership in social
>
> groups and categories." (pg. 4).

Tying It All Together - We can now say that digital role-playing games are a subdomain of the larger video game domain, meaning that they follow the definition of "any kind of organized activity within a society, in which one can readily array individuals in terms of expertise." (Gardner, 2006, pg. 31). By defining them as games we are also saying that they are "the voluntary attempt to overcome unnecessary obstacles." (Bernard Suits, 1978, pg. 38), and then role-playing games adds "the following basic functions: community building, problem solving, and identity alteration." (Bowman, 2012, pg. 32). "Good games offer players identities that trigger a deep investment on the part of the player." (Gee, 2007, 2008, pg. 32).

Creativity is "the interplay between ability and process by which an individual or group produces an outcome or product that is both novel and useful as defined within some social context." (Plucker, & Beghetto, 2004, "Creativity Defined", para. 2). Creativity is "largely dependent on an individual's intrinsic motivation to be creative." (Jaussi, Randel, & Dionne, 2007, pg. 249) and "Good games offer players identities that trigger a deep investment on the part of the player." (Gee, 2007, 2008, pg. 32). "'to be creative, a person has to internalize the entire system that makes creativity possible,' including both knowledge of the domain in which he or she is working and the professional judgement of the field of people who work in that domain." (Shaffer, 2007, pg. 95).

This literature, when connected, give a narrowing picture of the various components involved in researching the question put forth by this paper. Do digital role-playing games enhance the same areas of learning that game researchers speak of when

discussing epistemic games? At the same time, what effect do digital role-playing games have on creativity? In the next section the method for gathering supporting data will be introduced.

Methodology

The methodology for this paper is broken down into five sections. The first section discusses the type of study and why it was chosen. The second section discusses the participants and process by which they were selected. The third section discusses the procedure for gathering information. The fourth section discusses how the interviews were conducted. Finally, the fifth section discusses the goals of the study.

In the course of studying the literature for this paper, it became apparent that while there is much data in the surrounding topics of creativity, domains, games, and identity, there is very little directly connecting them to each other. After the frame work was developed for connecting creativity, domains, games, and identity, the goal of this research became to find more correlations between the topics, and then expand upon them. Several different methods of research were considered and then discarded due to the financial and time constraints of a graduate school program. One such method involved administering the Torrance Test to each participant, measuring participants' creativity both before and after playing DRPGs. This was not feasible due to the budget necessary for analyzing the results of the test as well as tracking participants over time. Eventually the resulting study was decided upon. The study is ethnographical and qualitative. It was conducted through surveys followed by a series of interviews. The

results and discussion section seeks to analyze the data collected through domains, learning, and identity.

Creativity is difficult to quantify. There are many different assessments and tests to try to quantify creativity but their validity is often questioned. According to Gardner (2006) "there is consensus that creativity tests have not fulfilled their potential (Wallach, 1971, 1985)" (pg. 176). Others have questioned whether the difficulty in measuring creativity is due to the difficulty in defining what exactly is being measured. Within the many different measures of creativity there "is a subtle shift in the magnitude of the creativity assessed. At the lower level is everyday, psychological, or 'little-c' creativity, whereas at the higher level is eminent, historical, or 'Big-C' Creativity." (Simonton, 2012, "Measuring Creativity", para. 2). The qualitative nature of this study was chosen due to the difficulty of accurately measuring creativity.

Participants. The research conducted for this paper is an educational ethnographic study comprised of an online survey and six in-person interviews. The participants in the survey were 96 high school students, ages 14 to 18, boys in a private, all boys, prep school outside of a major metropolitan city on the east coast of the United States. The participants, according to the school website, are assumed to be from a variety of socioeconomic and ethnic backgrounds, though this data was not collected during the course of the study. The overall population of the school is 33% students of color, and 1 in 4 receive financial assistance to attend (school website, retrieved 6/29/2014). All 333 upper school, 9th through 12th grade, students were invited to participate in the survey. The participants were chosen due their proximity and availability to the researcher who is

an art teacher at the school. The survey was presented first at a school meeting where the researcher announced it as well as the opportunity for participants to be entered into a drawing for a $50 Gamestop gift card.

The six interview subjects ranged in age from 14 to 18 years old. Two are Freshmen, ages 14 and 15; one a Sophomore, age 16; one a Junior, age 16; and two are Seniors, age 17 and 18. All six self identified as gamers.

Interview subject 1 (Student A) is a 16 year old male. According to his interview he has been playing video games since he was 3 years old, both casually and competitively. He is familiar with many platforms for both PC and console gaming. He specifies that he plays video games a few times a week. About half of that time is spent playing DRPG games. He is currently enrolled in art electives.

Interview subject 2 (Student B) is a 17 year old male. He has been playing video games for more than 7 years and currently plays for about an hour each day. Most of that time is spent playing DRPG games. He is not currently, but was formerly enrolled in art electives.

Interview subject 3 (Student C) is a 16 year old male. He has been playing video games for either 1 to 2 or 4 years. He reported 1 to 2 years in his survey but in his interview reported that he began playing at age 12. He currently plays every day for between 1 and 3 hours and plays DRPGs about half of the time. He is currently enrolled in a music elective.

Interview subject 4 (Student D) is a 14 year old male. He has been playing video games for more than 7 years reporting playing with his older brothers when he was 4 or

5. He currently plays every day for 1 to 3 hours and plays DRPGs about half of the time. He is currently taking an art elective.

Interview subject 5 (Student E) is an 18 year old male. He has been playing video games for more than 7 years reportedly starting at 7 years old. He currently plays a few times a week and plays DRPGs a few times a month. He states in his interview that he does not take art classes because he is dysgraphic. He is currently enrolled in a music elective.

Interview subject 6 (Student F) is a 15 year old male. He has been playing video games for more than 7 years, starting when he was 6 or 7. He currently plays every day for 1 to 3 hours and spends most of that time playing DRPGs. He is currently enrolled in an art elective. This interview subject answered questions through email due to scheduling constraints.

The interview subjects were chosen from the respondents to the survey based on the completeness of their answers and their self-reporting of participation in DRPGs. They were also selected based on their age and grade level range in order to have a sampling of each grade level. These students were chosen over others due to their well articulated survey responses as well as their availability to be interviewed and ease of receiving parent permission for the interviews. Of the six students, four are known by their peers and teachers as gamers and have been overheard speaking casually about video games by the researcher, inside and outside of class. All six identified strongly as gamers when asked about this identity during the interview process.

Procedure. The link to the 10 question "Video Game Survey" created for this research paper was sent to 333 students in grades 9 through 12 in March of 2014. The questions were written by the researcher and attempt to extract detailed responses for the participants that go beyond "yes" and "no".

The survey was introduced at a general school meeting as well as through an introductory email, and two follow up reminder emails. Participants were informed that well articulated survey responses would be entered into a drawing for a $50 GameStop gift card as well as other prizes.

The survey, administered through the website Survey Monkey over five days in March of 2014, was comprised of 10 questions (Appendix A). The first five questions asked about the participants' identity for the purpose of the contest, age, and game playing habits. Question 1 was for identification purposes and asked for the respondents name/age and is used occasionally to give context to a response, mainly placing the responses into context according to the age and grade level of the respondent and their expected writing ability at that age. Questions 6 through 10 asked about creativity including the influence of games on the participants' creativity, and the social awareness of games and creativity in the participants' lives. There were 96 respondents to the survey, 60 of whom spent more than 5 minutes working on their responses.

Interviews. Of the 96 survey respondents, 6 were chosen for follow up interviews based on several criteria. The first criteria was the thoughtfulness of their answers. The researcher looked for well formed opinions that pointed to strong critical thinking skills. Second, the researcher looks for a "yes" answer to question number 3 inquiring if the

respondent played RPG or MMORPG games. Third, the researcher looked at the age of the respondents in an attempt to include a variety of grade levels. Fourth, the researcher emailed the respondent to judge their willingness to be interviewed. Once these criteria were met the researcher was left with 6 respondents willing to participate in a follow up interview. The parents of all 6 interview subjects agreed for their child to be interviewed.

Interviews were held at school during students breaks or free periods at a time that was mutually convenient for the researcher and interview subject. They were recorded on a laptop computer with the subjects permission. The first five interviews had the same format and general questions with additional questions included to prompt more detailed responses. The sixth interview was done through email and so only the original questions are included.

Interviews were transcribed verbatim with the exception of interviews 2 and 6. Interview 2 was transcribed with intelligent verbatim transcription with the exception of 2 sections that were skipped because of unnecessary conversation. Interview 6 was an email interview and was not transcribed but copied directly from the body of the email. The goal of the data analysis is to determine which parts of the surveys and interviews are relevant and find themes in the data. This was done by looking for words and phrases that repeat in both the surveys and interviews, as well as looking for ideas that the respondents generated that connect back to the literature review. The data produced was looked at both in its entirety and after filtering for relevant game playing habits of the respondents.

Results and Discussion

As stated in the introduction, the aim of this study is to show a connection between digital role-playing games, and the concepts that students are learning while playing them. Particularly the concepts that have an observable impact on creative thinking and how it is used outside of the world of the game. This impact will be discussed using practical examples gathered through student responses to survey questions as well as interview questions. An examination of the literature reviewed in the context of the student responses will also be used to show possible connections.

The first five questions of the survey were used to gather information about the participants. When looking at the results of these questions it was determined that in order to analyze the survey for the desired information some respondent's surveys would be discarded. The surveys to discard were determined based mainly on the answer to questions 3 "On average, how often do you play video games on any platform (e.g. gaming consoles, mobile phones, computers, etc.)? Write the title of your favorite video game in the "Other" box" (Q3).

Of the 96 responses to Q3, which asks about how often respondents play video games, only 3 respondents replied "not at all" (see table A). These students most likely responded to the survey due to the incentive for responding which was a drawing to win a $50 gift card to GameStop, a well known chain of video game stores. Students that did not play video games had very little reason to respond to the survey. In fact, two of the three respondents that reported no video game playing were current students of the researcher and volunteered the information that they "took the survey because you're our teacher". The third student who reported not playing games on any platform wrote in that

he played games on a tablet. These 3 responses were compared to the same student's responses to question 2 before a decision was made about discarding them.
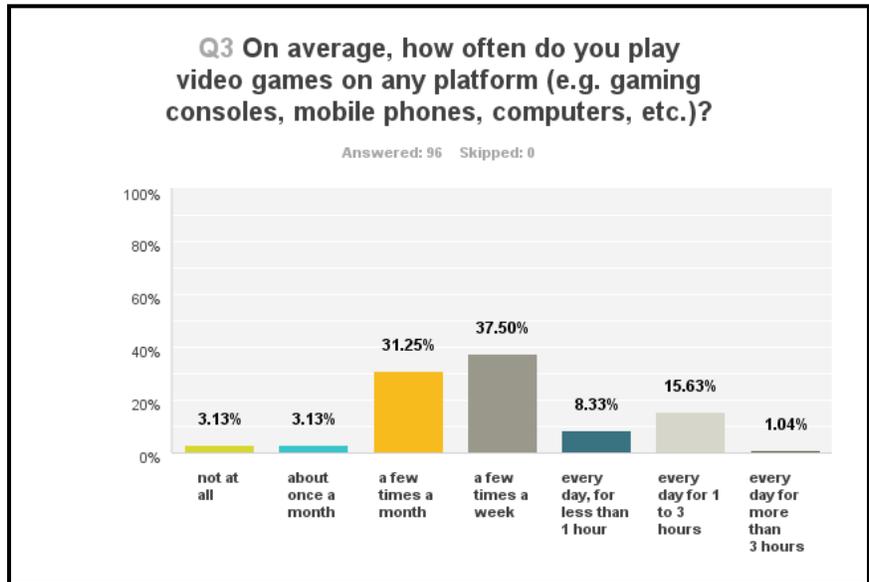
(Table A)

As an addition to Q3, the survey asked respondents to list their favorite video game. 64 respondents submitted an answer generating 30 unique responses. Various sports games including the *Madden* series, *NHL* series and *FIFA* series, accumulated 25 of the responses. *League of Legends*, a team battle game was the most popular with 8 (a very similar game called *Smite* also had one response). Other first person shooter (FPS) games *Halo* and *Call of Duty* each had 3 responses. These results were expected based on the population of high school males taking the survey.

Question number 2 (Q2) asked what system respondents used for gaming and included options including computers, hand held gaming devices, and dedicated gaming consoles. Of the 96 respondents, 57.29% played on desktop or laptop computers, 10.42% played on hand-held gaming devices, and 90.63% played on dedicated gaming consoles.

3.13%, 3 respondents, stated that they had not used any of the available options, although one of the 3 respondents listed a console game as something he plays once a month and therefore did have some video game playing experience though not in the past 30 days (Table B). It was determined that the two students who responded that they played no games would be discarded at this time.
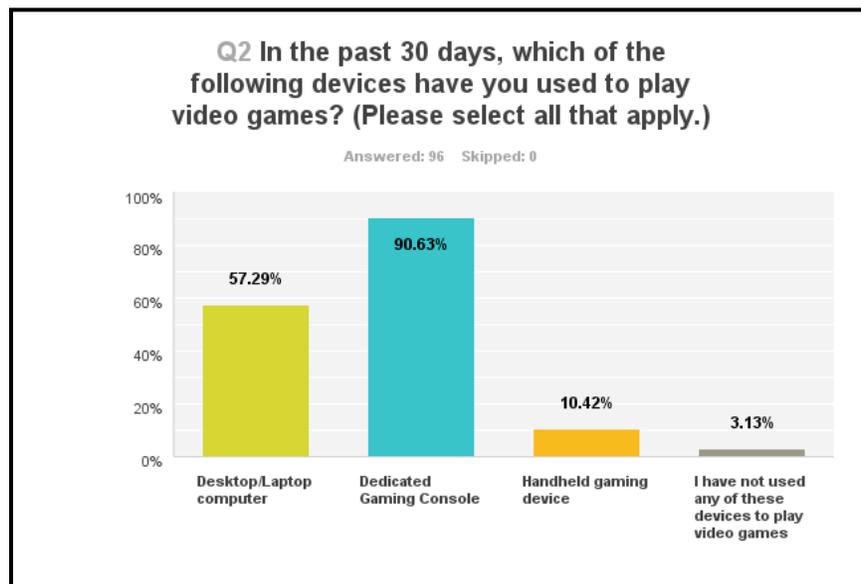
(Table B)

When the data was filtered for respondents who stated that they play DRPGs and MMORPGs the number of responses dropped to 47, or 51.6% of the subjects. This is significant due to the importance of the question in relation to this thesis. To find the anecdotal effect of these two types of digital role playing games on creativity it makes sense to look only at the students who play them.

Of these 47 respondents who play DRPGs and MMORPGs, 76.6% play games on desktop or laptop computers, 19.15% play on handheld dedicated gaming devices such as a Nintendo DS, and 97.87% (46 of 47) of respondents play on a gaming console such as

the Microsoft Xbox 360 (Table C). This is in holding with current research from the

Entertainment Software Association stating that more gamers play DRPGs and

MMORPGs on computers than on gaming consoles. The percentage of console gamers

remains high due to the fact that respondents were able to choose more than one system.
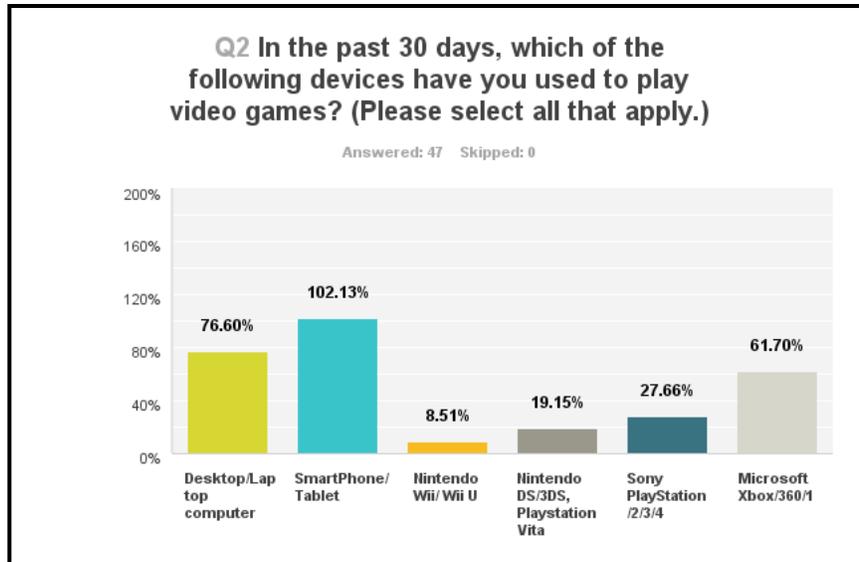
(Table C)

91 of the respondents answered question 4 (Q4) regarding amount of time spent

playing RPGs or MMORPGs. 5 respondents left the question blank. Of the 91 responses,

48.35% do not play RPGs or MMORPGs, 21.98% play for "a few hours a month", 8.79%

play "1/4 of the time", 8.79% play "1/2 of the time", and 8.79% play "3/4 of the time".

3.30% play RPGs or MMORPGs "all of the time" (table D). There is a possibility for

confusion in the data here because three of the respondents that listed *League of Legends*

(LoL) as their favorite game stated that they play DRPGs "all of the time". Though it

does share some similarities, *LoL* is categorized as a "multi-player online battle arena"

and does not meet the definition of an RPG. Because of the nature of the questions it is

unclear if 5 of the other 6 respondents were aware of this distinction. One respondent did specify in his answer that he plays RPGs all of the time that he does not spend playing *LoL*. These add up to the same 47 respondents discussed earlier.
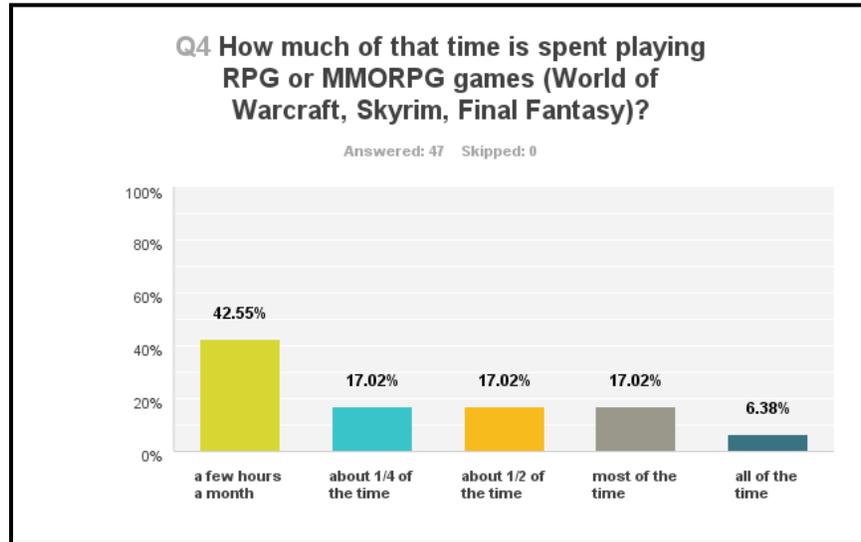
(Table D)

The majority of the respondents have been playing video and computer games for more than three years with only 4 of 91 respondents answering 1 to 2 years, and zero answering less than 1 year. 59.78% of respondents answered that they have been playing video games for more than 7 years. With the oldest respondent reporting that they were 18 years old this means that the majority of respondents began playing at 11 years old or younger. This is in line with the interview subjects who stated ages ranging from 3 to 12 years old as when they began playing video games.

Overall the results of the first 5 survey questions seem to indicate that the population surveyed is in line with what the Entertainment Software Association found when looking at who plays video games in North America. This indicates that despite the

survey being given to only the students at a small, all male private school it is still a good

representation of who the gamer population is according to the ESA.

The next five questions discuss the respondents thoughts about creativity, both

their own and others. Many responses were short, yes or no, answers while others went

into more detail. The single word answers were included for the purpose of totals even

though they did not give detailed discussion on their answers.

34 of the 96 respondents to question 6 (Q6) totaling 35.42% felt that they do talk

or think about video and/or computer games while writing or creating art. Fifteen of them

recreated some game elements within their art. Three felt that they learned about plot and

structure from games. Three others used games as the subject matter of a work. However,

60 of the 96 respondents (64.58%) did not believe that games influenced them creatively.

Six of the respondents felt that gaming was not comparable with writing or art. One

respondent felt that inspiration from games was "copying" and wanted to be original.

This was observed to be the same stigma that many games are faced with, especially

when discussed in a school setting. Students are told that game playing can only be

negative or at best, neutral. If you ask them to look at gaming in a positive light they are

unable because they have been told that gaming is "bad" or a "waste of time". It would be

interesting to note if the respondent who felt inspiration from games was "copying" felt

the same way about studying the works of master painters as a format for learning about

painting.

The following survey response to Q6 is from a seventeen year old high school

senior when asked if he thinks about video and/or computer games while writing or

creating art. This student reported that he has been playing video games a few times a month for more than seven years.

> Video games provide a unique form of expression where in addition to the composition of a game's individual elements (graphics, sound/design, level design, etc.), one of the main elements being explored while playing is the rules of the game itself. Video games reward players who are willing to learn a set of rules and use them creatively to pass through the game's scenarios, a technique that has improved my writing by letting me think of many different ways of expressing the same thing. As a writer for the newspaper, I need to be able to take simple factual information and convey it in an interesting way that also flows well in the other parts of an article. Playing any game where I must complete a simple task in such a way that prepares me for another has helped me in these situations. Similarly, video games also help when trying to design a system or set of rules, since each game is its own set of rules that a player learns to optimize. They have also lead me to think about construction different elements of all art in a more organic way. For example, in an adventure game, the player sees large, interconnected areas whose items and characters are spread out in a way, that tests and rewards the player according to a certain pattern.

In his explanation the student touches on several of the important points that this research attempted to bring together. The first point is when he says "Video games reward players who are willing to learn a set of *rules* and use them *creatively* to pass through the game's scenarios" [emphasis added]. This recalls Jane McGonigal (2011), "rules push players to

explore previously uncharted possibility spaces. They *unleash creativity* and *foster strategic thinking*." (pg. 21). The second point of comparison is where he discusses taking techniques from the way games are made and using them in the domain of writing.

Since the research has established the need to view creativity as transferable across domains it is fair to support this student's statement that he is using the creative processes he has learned from playing DRPGs in his writing. He is equating his identity as a gamer, and the ability of gamers to identify rules and use them creatively, to identify the rules he needs in order to write a good newspaper story. The story is inherent in DRPGs is one of the main components that interview subjects identified as important in bridging the semiotic domain of video games and real world creativity.

Several other respondents list writing and story plots as situations where they think about video games. The first interview subject (Student A) speaks specifically about story in video games, which we know from the literature is a vital component of DRPGs. When describing one of his favorite games, the FPS *Halo*, he states

> I think the reason I like first-person shooters in general is because of the story. So contrary to what most people believe, I'm actually in it for the story. I play the story first, all the time. I try to complete the story then I move on. It's kind of like a ritual or tradition.

So, despite the game *Halo* being categorized as a FPS, Student A still recognizes the story as the driving force behind his desire to play it. Though it isn't a DRPG, this still gives credence to DRPGs and their story telling component having a powerful effect on the

people who play them. The second interview subject (Student B) also talks about story as something that draws him to video games. He brought his Nintendo 3DS to the interview on which he was currently playing the DRPG *Bravely Default*, a classic Japanese style DRPG that relies heavily on story and character development. The third interview subject (Student C) believes "RPGs make [game playing] more like a fantasy book or something like that, so it's actually entertainment."

Another notable response to Q6 was from a survey, the respondent, who is a musician, stated

If a cool or thoughtful scene pops up in the story of a game, sometimes it inspires me to try to depict that in a drawing. Also, sometimes I like to use the soundtracks of games to help me in a jazz improvisation solo.

While music is not the focus of this research it is also the subject of numerous studies about its effect on the human mind and how people think.

The results to question 7 (Q7) were similar when respondents were asked if game characters or avatars influenced them when they were creating art. 32.29% said yes, 63.54% said no and 4.17% said maybe. 14 of the respondents had recreated some elements from games in their own creative work, 7 had done work based on comparative studies of their own characters on game characters and 3 thought gaming gave them an boost creatively. 10 respondents believe gaming and art are incompatible or not relevant to each other. This question may have been too similar to the previous question as the majority of the respondents kept their answer from the previous question, though some

did elaborate more. Student A's detailed response, from his survey, not his interview, is as follows

> Absolutely. My entire freshman year, (in the obligatory drawing class) I spent every ounce of free time I had in the drawing room perfecting a drawing of a helmeted Halo soldier, [I continued working on it] well into my second semester during Ceramics. Now that I think about it, basically all of my drawings included some aspect of something I saw in a video game. When I was drawing a post-apocalyptic scene, I drew elements from Arma II's DayZ Mod [a user created addition for the computer game ArmA II]. When I drew a floating city paradise, I drew elements from Bioshock Infinite. This list goes on, and on.

Gamers like Student A, who has been playing video games since the age of 2 or 3, are well equipped to take advantage of the benefits gaming has to offer. He speaks about gaming competitions, modifying game files, the emotional take away of game stories, and using ideas from games to help him remember facts in class. Recalling Gardner's definition of a creative person "Those youngsters who are (and who feel) marginal, within their culture, those who are ambitious and stubborn, those who can ignore criticism and stick to their guns are 'at risk' for a creative life." (Gardner, 2006, pg. 47) we can easily see where gamers such as Student A who could fit the mold he is describing. Having more than ten years of video game playing experience, Student A was very insightful and able to describe his experiences in detail. A subject with such a varied history of game play, from casual to competitive, gives a added level of expertise to his observations of his own process for both game play and the things that interact with it.

When asked in question 8 (Q8) about their own creativity and whether friends or family members call them creative, 71.88% said yes, 26.04% said no and 2.08% said maybe. In this question, more than 60% of respondents elaborated on their answer. 12 stated they were praised for creative writing, 7 for some type of craftsmanship or building and 6 were called creative for generating new ideas. Furthermore, an additional 35 respondents were praised for for a variety of things including various activities related to art, games, music, and acting. Problem solving, sports and vivid dreams were also listed as instances of praise for creativity.

These percentages changed when the results were filtered for respondents that also played RPGs or MMORPGs. 39 of 47 respondents or 82.97% reported being called creative in some capacity, one elaborated by saying, "I was called creative at one point by aeronautical engineer once, who said that I had an interesting knack for finding solutions to issues in unexpected ways." This question was written to determine what, if any difference there was between respondents views of their own creativity and the views of their peers, parents and teachers. The high number of respondents who responded with an affirmative is reinforced by the results of question 9.

Respondents were also asked in question 9 (Q9) about their feelings on their own personal level of creative thinking. 67.71% answered yes to the question "Do you think of yourself as a creative thinker (Do you have new and different ideas? Are you good at creative problem solving?)?" and an additional 8.33% answered maybe. The responses to this question were extremely varied, though 19 respondents stated that they believe they are creative in generating ideas and an additional 19 said they are creative problem

solvers. The remainder of the responses varied from drawing, to writing to finances, physics, negotiating and procrastination techniques.

When Q9 was filtered for RPG/MMORPG gamers the results were that 38 out of 45 or 80.08% self reported as believing they are creative thinkers, with 2 reporting that they are not creative but then describing a situation where they displayed creativity. While self-reporting creativity is not the ideal measure it, along with respondent descriptions, gave a good basis for choosing interview subjects. Questions asking the respondents to make a decision based on an undefined term, creativity, also resulted in a great deal of ambiguity. This was particularly obvious in the final survey question, 10 (Q10).

The final survey question asked if the respondent believes that gamers, in general, are creative thinkers. The results for this question were widely spread though the majority, with 46.88% responding yes. 29.17% don't believe gamers are creative, 5.21% said maybe, 15.63% believe it depends on other factors and 3.13% didn't give an understandable answer to the question. 15 of the respondents pointed to general problem solving skills as something that makes gamers creative. 9 believe that only certain types of gamers are creative. 8 point to imagination as a measure of creativity. In addition, 8 believe gaming is inspirational. 8 respondents were unwilling to generalize the potential creativity of gamers. Of the respondents that answered in the negative, 5 believe that games only have one or two correct answers and this prevents gamers from being creative. 3 said that gamers are only consuming, not producing anything. 3 don't believe

that gaming affects creativity and 2 don't think games are creative, only derivative. Said one respondent that answered positively

> Because the level of difficulty, the game's music and graphics, and the set of options available to the player change as the player controls the actions of the game, the player can gets a sense of how to put together seemingly disparate elements together in order to create a certain sensation. For example, a filmmaker must think about where to place the camera, how to light and design the set, how to instruct the actors, what sound effects and music to use, and fit these elements together to create a certain sensation in the audience. A gamer already has familiarity with interacting with these elements, since their actions in a game have already given them practice affecting them.

There were several key factors in analyzing the data collected in the course of this research. The first was the divide between what different people believe creativity is. Many students were confused by the term creativity, or creative thinking. This isn't surprising due to the lack of consensus in the academic world on a definition. Some students responded to the term as a construct solely belonging to art. Others took a more general definition, referring to creative thinking in multiple domains. While this produced interesting results on the subject of what high school students think creativity is, in the case of Q10 in particular, it prevented a consensus in the responses. Despite this several well thought out responses were submitted.

The second key factor was the methods in which the respondents and interview subjects described what they believe they take away from playing video games. The topic

that became the most prevalent was the idea of the "story". Interview subject 5 (Student E) described in detail what why he believes the story is a vital part of a DRPG.

> RPGs definitely get their independence from other genres due to their longer pacing, more time spent, [and] usually [a] better-crafted story. It's less about core gameplay and more about the idea of the journey, to interact with it. So I think that's really what sets it apart, is that you spend more time there, you're engrossed in the story, you're making decisions that impact the story- all of a sudden you need to decide to kill one character or save another, or fight with this group instead of this group, and alter the course of the story and go through the branching tree limbs and hopefully you end up at, I guess, the ending you want.

When discussing the connection between DRPGs and their creativity the students interviewed had mixed responses, however, the majority of them were positive. Even if they could not pinpoint a situation where they used creativity gains from a video game they noted a sense that video games were a way to both relax, and focus. To try new things and accomplish something just outside of what they thought they were capable of. Some of them recalled situations both inside and outside of school where they connected video games to a process that they felt was creative. The understanding of the structure a story and the the ability to identify the rules of the story and use them creatively was one take away of the DRPG gamer. Another was a sense that the players had of being an expert in their game identity. This was observed in several instances and refereed to when subjects were asked about game skills used outside of games. The ability to become, or

feel as if they have become, an expert while taking on that identity is optimal for promoting creativity.

Without a method to accurately measure creativity and changes in creative thinking over time these anecdotal situations are the most accurate depiction of a connection between DRPGs and creativity that this study can produce. Though there is much anecdotal evidence a true measure of the results of DRPG playing on creative thinking will have to wait for a larger, more funded study.

Conclusion

The question of role-playing video games and their affect on transferring creativity across domains is large and unwieldy. There are many variables to account for and a great deal of debate in the literature itself. The study of creativity and video games is still so new that there is nearly no literature to compare. Two years ago there was literally no literature as Jackson, et al.'s study had not yet been published. With so much disconnect even in what researchers want to call creativity it is difficult to imagine a comprehensive study that can be reviewed without massive debate.

At the same time this line of inquiry opens the door to many more questions regarding the effect of video games on creative thinking. A notable survey response discovered during the analysis process was to the question "Do you think gamers in general are creative thinkers? Why?" The student respondent, who is a 16 year old high school junior and also well regarded in the art department, stated,

I don't think that playing video games makes you creative. If it did, playing video

games probably wouldn't be as frowned upon as it is. Video games would

probably be part of the curriculum if it made you creative. But it's not.

This bears the question, in an environment such as this private prep school, where any

web site with the word "game" in the title is blocked by the web filter, what part did

stigma and stereotype play in students survey answers? How would their impression of

gaming, and thus their answers, change if the survey was approached differently? How

would the results change if students were asked to participate in one of the epistemic

games discussed by Shaffer or Gee before answering questions?

Future questions that have became apparent in the course of this research include,

- How can we define creativity in regards to video games in such a way that we can
  measure the affect of games on it.

- What elements of DRPGs, as a genre, are exclusive or more prevalent than they are in
  other types of digital games and how do DRPGs affect these elements?

- Is the culture of anonymity surrounding some subdomains of video games, such as
  MMORPGs, a hinderance to any potential creativity?

- Is perseverance an element of playing games and does it transfer to a learning situation?

DRPGs may have a stronger connection to the elements that enhance creative

thinking than other genres of digital games do. DRPGs support many of the same domain

relevant skills that are found in creative thinking. They provide intrinsic motivation that

triggers a deep investment on the part of the gamer. They are a system the player can

internalize and that provides them with skills in "community building, problem solving,

and identity alteration." (Bowman, 2012). All things that have been shown to lead to an increase in creative ability.

While this study is not able to definitively answer the question of digital role-playing game's effect on creative thinking and how it translates to core subjects, it is a step in the process of reaching an answer. Future studies in this field should look at the effect of video game play over time and in relation to a control group of non-gamers. While the results of this paper lead me to believe that the effect of DRPGs on creative thinking is positive and does translate to other domains I also believe that the true depth of this effect cannot be measured in a small study such as this. It is my hope that this research is continued at some point in the future, on a larger scale as well as over time, to find a definitive answer.

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Appendix A

Survey Questions:

Q1: Please include your first name/last name/age for identification.

Q2: In the past 30 days, which of the following devices have you used to play video games? (Please select all that apply.)

Desktop/Laptop computer

SmartPhone

Tablet

Nintendo Wii

Nintendo Wii U

Nintendo DS/3DS

Sony PlayStation

Sony PlayStation Vita

Microsoft Xbox

Microsoft Xbox360

Microsoft Xbox1

I have not used any of these devices to play video games

Other (please specify)

Q3: 3. On average, how often do you play video games on any platform (e.g. gaming consoles, mobile phones, computers, etc.)? Write the title of your favorite video game in the "Other" box.

not at all (skip to question 8)

about once a month

a few times a month

a few times a week

every day, but for less than 1 hour

every day for 1 to 3 hours

every day for more than 3 hours

What is your favorite video game?

Q4: How much of that time is spent playing RPG or MMORPG games (World of

Warcraft, Skyrim, Final Fantasy)?

a few hours a month

about 1/4 of the time

about 1/2 of the time

most of the time

all of the time

Other (please specify)

Q5: How many years have you been playing video and/or computer games?

less than 1 year

1 to 2 years

3 to 4 years

5 to 6 years

7+ years

Other (please specify)

Q6: Do you talk or think about video and/or computer games while writing or creating art (visual or performing)? Give an example.

Q7: Do your video and/or computer game characters or avatars influence you when writing/creating art? Give an example.

Q8: Do your friends/family call you creative? Briefly describe a time when someone called you creative.

Q9: Do you think of yourself as a creative thinker (Do you have new and different ideas? Are you good at creative problem solving?)? Give examples.

Q10: Do you think gamers, in general, are creative thinkers? Why?

Survey Response Data (Q6 - Q10): Coded by an independent research assistant.

Q6: Do you talk or think about video and/or computer games while writing or creating art (visual or performing)? Give an example.		
Responses	#	%
no	62	64.58%

yes	34	35.42%
Total	96	

General Categories of responses	#	%
No elaboration or nonsensical elaboration	57	59.38%
Recreated some game element(s) in writing or art	15	15.63%
Gaming/Art incompatibility or nonrelavance to each other	6	6.25%
Learned about plot & structure from games	3	3.13%
Games were the subject matter of a work	3	3.13%
Just think about games all the time	3	3.13%
"think of story lines and characters and what they would do in such situation"	1	1.04%
Learned about combining multiple elements in an artistic piece	1	1.04%
Coordination improvements from gaming improved musical skills	1	1.04%
Disagree, but does think it helped spatial-relation skills	1	1.04%
Disagree, doesn't want to copy other people's art, want to be original	1	1.04%
Games are an inspiration	1	1.04%
Learned many facts from games	1	1.04%
Participating in fan culture	1	1.04%
Subconsciously influenced	1	1.04%

Q7: Do your video and/or computer game characters or avatars influence you when writing/creating art? Give an example.		
Responses	#	%
no	61	63.54%
yes	31	32.29%
maybe	4	4.17%
Total	96	

General Categories of responses	#	%
No elaboration or nonsensical elaboration	55	57.29%
Had recreated some elements from games in own creative works	14	14.58%
Felt there was a Gaming/Art incompatibility or nonrelavance to each other	10	10.42%
Had either based or done comparative studies of own characters to game characters	7	7.29%
Thought gaming gave them an imagination/creativity boost	3	3.13%
Felt games had some subconscious effects	3	3.13%
Were participating in fan culture	2	2.08%
Were inspired by games	1	1.04%
Felt games were just too unimportant to them, personally, to have effect	1	1.04%

Q8: Do your friends/family call you creative? Briefly describe a time when someone called you creative.		
Responses	#	%
no	25	26.04%
yes	69	71.88%
maybe	2	2.08%
Total	96	
General Categories of responses	#	%

No elaboration or nonsensical elaboration	36	37.50%
Praised for creative writing	12	12.50%
Praised for having crafted or built creatively	7	7.29%
Creativity when generating new ideas	6	6.25%
Creative Artwork	5	5.21%
Praised for creativity in gaming pursuits	5	5.21%
Praised for musical work	5	5.21%
Praised for both creative writing and artwork	3	3.13%
Jokes	3	3.13%
Praised for creative ceramics Work	2	2.08%
Praised for their improvisational work	2	2.08%
Praised for creative Problem Solving	2	2.08%
Being inventive with menial tasks	1	1.04%
For having diverse creative pursuits	1	1.04%
For their elaborate event planning	1	1.04%
Praised for creative photography	1	1.04%
Creativity during Sports	1	1.04%
Creativity during Sports, Writing and Artwork	1	1.04%
Creativity for having Vivid Dreams	1	1.04%
Creative because of Website creation	1	1.04%

Q9: Do you think of yourself as a creative thinker (Do you have new and different ideas? Are you good at creative problem solving?)? Give examples.		
Responses	#	%
no	23	23.96%
yes	65	67.71%
maybe	8	8.33%
Total	96	
General Categories of responses	#	%
No elaboration or nonsensical elaboration	40	41.67%
Generating ideas	19	19.79%
Problem Solving	19	19.79%
Problem Solving - Puzzles	9	9.38%
Innovation	5	5.21%
Inventions	2	2.08%
Creating and engineering	1	1.04%
Experimenting	1	1.04%
Problem Solving - Challenges	1	1.04%
Subjects mentioned specifically	#	%
math	9	9.38%
puzzle or puzzles of some sort	5	5.21%
writing	5	5.21%
drawing	3	3.13%
gaming	2	2.08%
sports	2	2.08%
Stories	2	2.08%
critical thinking	1	1.04%
Finances	1	1.04%
physics	1	1.04%
practical day-to-day things	1	1.04%

Negotiating	1	1.04%
photography	1	1.04%
procrastination techniques	1	1.04%
sat sentences	1	1.04%
Website design and creation	1	1.04%

Q10: Do you think gamers, in general, are creative thinkers? Why?		
Responses	#	%
no	28	29.17%
yes	45	46.88%
maybe	5	5.21%
depends	15	15.63%
Didn't give discernable answer	3	3.13%
Total	96	
General Categories of responses	#	%
Non elaboration or nonsensical elaboration	21	21.88%
Problem-solving skills involved in gaming	15	15.63%
Yes for some games, no for others (mostly puzzle gamers yes, shooter no)	9	9.38%
The imagination involved in gaming	8	8.33%
Gaming is inspirational	8	8.33%
Unwilling to generalize All Gamers	8	8.33%
Participant Misunderstood and answered about game creators' creativity	6	6.25%
Games actually only have one or two answers, not creative	5	5.21%
Gamers are just consuming, not producing	3	3.13%
Doesn't believe gaming affects creativity	3	3.13%
Believes gaming increases concentration/multi-tasking	2	2.08%
Experiences basis for creativity, not games	2	2.08%
"It's a form of stimulation"	1	1.04%
Creative people are drawn to gaming	1	1.04%
Gamers are good at ferreting clues	1	1.04%
It's innovation more than creativity	1	1.04%
RPGs involve creativity	1	1.04%
The majority of games aren't creative anyway	1	1.04%
wouldn't be true creativity, just derivative works	1	1.04%

Interview Questions:

When did you start playing video games? How old were you?

Do you think of yourself as a gamer?

What draws you to video games?

How do you think RPGs are different from other types of video games?

Talk about a real world situation where you used a skill or used knowledge you learned from playing video games.

Appendix B

Interview Transcription 1

Researcher: How old were you when you started playing video games?

Student A: I think I was around 2 or 3 years old. I started really young.

Researcher: What kind of games were you playing at that age?

Student A: Back then, I can remember playing car-driving games. I was into the *Need for Speed* kind of thing, so I played a lot of those.

Researcher: What were you playing on? On the computer?

Student A: I was playing on both the computer and the PS2. PS2 is my first system.

Researcher: Do you tend to think of yourself as a gamer?

Student A: Yeah. Normally I would identify myself as a gamer. I feel like I can connect with gamers easier because we have similar interests.

Researcher: Do you have more online gamer friends or school and real-world gamer friends? Or some of both?

Student A: I think I've found a healthy balance between the two. I certainly have enough school friends for me to keep going, but I do have some online friends that I talk to most of the time. I'd like to think I've found a healthy balance between the two.

Researcher: Mostly in this country, or are they all over the world?

Student A: Mostly in this country. Because when you want to play together, you have to be at least in a relatively similar time zone for it to work.

Researcher: That does help.

Student A: Yeah, so on X-Box or PS3, it usually helps to be in the same time zone.

Researcher: I know you listed games like *Kingdom Hearts…*

Student A: *Kingdom Hearts, Assassin's Creed, Halo*, and this one DS game as some of my favorites.

Researcher: Are those all X-box 360 games?

Student A: No, actually. The last one, *The World Ends With You,* is a DS game, *Assassin's Creed* I started to play on the PS2 when the first one came out. *Kingdom Hearts* is also on the PS2. *Halo* in and of itself is all about the X-Box consoles. I think I've been pretty much everywhere.

Researcher: Do you prefer console games or PC games for the experience?

Student A: I feel like the PC gaming community has a larger following and a closer community. Also, the thing with PC games is that you can modify files, so certain games you can change to your liking. I've learned how to do that- going into the technical stuff and changing damage values, all the things like that.

Researcher: How did you learn how to do that?

Student A: It took a little bit of time. I just asked around and, I don't know.

Researcher: Internet research kind of thing?

Student A: Yeah, internet research. But with the console games, I feel like everything runs a bit smoother because the games are meant to fit for that console so it won't be lagging or anything like that, so I usually enjoy the console games because they run more smoothly. That being said, I don't really like the console gaming community because nowadays there's a lot of middle schooler kids and I try to stay away from all the games that lots of people play.

Researcher: Lots of trolls?

Student A: Yeah. So, *Call of Duty* I'm not a big fan of.

Researcher: Do you play any of the first-person shooters?

Student A: Yeah. *Halo* I listed as one of my favorite games. It's not so much the first-person shooter aspect, but the actual story behind it. It has a really rich story. They really spent time on that, so I felt myself immersed in the story and that's why I got hooked on to it. The multiplayer was like the icing on the cake. I turned out to be really good at it and I went to a couple of gaming competitions. I think the reason I like first-person shooters in general is because of the story. So contrary to what most people believe, I'm

actually in it for the story. I play the story first, all the time. I try to complete the story then I move on. It's kind of like a ritual or tradition.

Researcher: You answered my next question already. How do you think that RPGs are different from other types of video games?

Student A: RPGs have the potential to… well, the gamer has the ability to control what he wants to do, and I really appreciate that. I think whoever came up with the genre is a genius, because I think it lets the gamer have a little bit more individuality in that game and can express himself in a different sort of way. I wouldn't really classify *Assassin's Creed* as an RPG but it has many RPG aspects of it. If you put more armor on, it looks a little bit tacky to me, so I would try to go with no armor. You have that choice to do so and I really appreciate that, as opposed to games like *Call of Duty* when you step inside the story mode you have a set loadout or equipment that you have to use. You do have some options to switch around but you have to play along with the story. I kind of like that sense of freedom with RPGs.

Researcher: I want to talk a little bit about how you might use video games outside of the game itself. Can you think of a real world situation where you've used some kind of skill you learned in a video game?

Student A: I could list a couple of things. In my drawing class last year, I used to draw scenes from video games that I really liked, the scenery, characters, anything along those lines and I really enjoyed it. One of my favorite things to do is draw. Even in my free time at home I occasionally draw a dragon or a suit of armor. In terms of real world application, I've played this online military simulation game made by the United States military called *America's Army*, and I'd like to think that I mimic those when I do outside activities such as paintball.

Researcher: How about non-artistic and non-physical skills?

Student A: Especially in JRPGs, there's some kind of meaning behind those so I think you can have some kind of intellectual takeaway from video games. I remember in one *Final Fantasy*, one of the earlier ones, one of my favorite characters died and it had an emotional impact. While it wasn't real, I could experience what it was like to have a loss, maybe not on the extreme real world level but at least it could help me prepare for it in case something actually happens in the real world, so I think you can have an emotional takeaway from it.

Researcher: Are you talking about 7 with Aeris?

Student A: Yeah.

Researcher: I think a lot of people were very impacted by that.

Student A: I was really disappointed about it. It helped with the story, as much as I didn't want them to die, it helped progressed the story and got me more into it, which is kind of ironic.

Researcher: Are there any other classes outside of art classes where you think that video games or things you've learned in games can be useful?

Student A: Absolutely. There's a guy on Youtube, there's a group called the Game Theorists, and what they do is make up theories about video games that can be a variety of things. It can go from myths within a game, such as in *Portal,* is the companion cube actually a person, to in *Bioshock Infinite*, which is also a game that I like, could something like a city in the clouds be actually feasible. They talk about the science behind that and I picked up something along the lines about a super conductor, how it works, and if it could be applied in real life to make a giant city. I think most video games have a scientific aspect to them. You can see that in the *Mass Effect* games and *Halo* games and all of the sci-fi genre. It's also why I like the sci-fi genre in general, because there's some sort of intellectual aspect.

Researcher: Do you find that you make more connections in class when your teacher talks about things and you go, "Oh, I remember that from…!"

Student A: Yeah, we were talking about electron repulsion in science class and in my notes I wrote "refer to Game Theorists' video: *Bioshock Infinite*"

Researcher: It helped you remember it later?

Student A: Yeah

Interview 2 transcription

Researcher: How old were you when you started playing video games?

Student B: Maybe 7, or something? A really young age. I remember I was being babysat at someone's house and they had one of those really old, original Game Boys. I can't remember what game it was, but I remember playing that and being really good at it. I played it for a while and I ended up beating my babysitter's high score. I thought that was pretty cool and I started raving about video games and started playing them a lot more.

Researcher: Did you have computers and stuff at home before that?

Student B: I did. I had a computer at home, it was an old PC and I don't remember the name of the game that was on it. It didn't have a plot or anything but it was one of those really basic quest-style games almost. There was this other one with bumper cars where you navigate through this really weird 3-D world and collect these orbs or something, it was pretty cool. I remember that it would take hours to load and I remember just playing that a lot. I think the first system I think we got was the Playstation 2. Or was it the Nintendo 64? I think it was the Nintendo 64.

Researcher: That one came out before the PS2 I think.

Student B: Yes. I remember playing that one a lot. I remember one of my favorite games was the *LEGO Racers* game, it was pretty cool. I remember lots of portals and jumps to make and cool stunts you could do in the game. I remember playing *Pod Racers* and stuff like that. Then there was *Mario Kart* and *Mario Party*. I remember *Mario Party* because I would play that with my brother and I would beat him in the game, and you know older brothers always know their younger brothers' buttons, so he would always get me really mad whenever I'd beat him because he would say things that weren't actually mean words or terms to just get me mad, it was just the way he could say it.

Researcher: To get back at you for winning?

Student B: Yeah, pretty much. I wouldn't be able to bet him in athletic events at the time, so video games were always something I could crush my brother at. I had slightly better reflexes and attention for them, I guess. I remember that they were always something really stimulating to do, because I had ADD and I'd have to pay attention. I was good in school, but I had ADD and I have a lot of trouble focusing so video games were always really stimulating. They were really interesting and had lots of bright colors and stuff like that. Sometimes it was bad because I would play too much, like in middle school. Middle school was kind of rough, so it was something I liked to do to relieve stress. Once I got to upper school it went away, I started playing in more moderate amounts to a more healthy degree so it became more enjoyable. But I always had sports to do too, which was good to balance it out.

Researcher: How long have you been here?

Student B: I've been here since 4th grade. What were some of the other games I played? I remember the *Pod Racers* game always being pretty cool, because it had all the characters. I still play the game now too, because one of the things that prevents me from doing some of my homework besides the obvious case of senioritis…

[Here is where he stops to talk about moving and his room set up]

I also play some Playstation games. I remember playing *Sly Cooper,* that was a pretty cool.

Researcher: Do you play any RPGs?

Student B: I play a lot of RPGs now. I love RPGs. I like the stories in RPGs a lot. I play a lot of them on my 3DS since I don't really have any on other systems.

Researcher: Do you play any PC games, or all console games?

Student B: I never really played PC games. I do remember that I played a lot of *LEGO Chess* and I was really good at that. I'm not sure if I can attribute that to being good at chess. They had a lot of work put into that game. They had animation sequences for each and every possible battle between pieces. I remember I played that a lot; that was one of my favorites. I played a lot of LEGO games, they're actually really fun. They were kind of glitch too, which made them even more fun. So you could exploit some of the systems in the game. That's what one of the best values I think that I get from video games. I think they teach you how to exploit certain situations, not explicitly exploit, but you have boss battles in games with weak points, but then there's weak points in the code and stuff like that. I can see sequences in actual events, too, so I can say "Oh, I can just do that" and different options and stuff like that. I always thought that was kind of interesting, like you can get better at exploiting the codes

Researcher: Find all the tricks.

Student B: Yeah, something like that.

Researcher: What about with RPGs?

Student B: I like those because they have a lot more story to them. I really love the depth to them. I also like amount of play time they have, because I get really good at games and beat them quickly.

Researcher: And then they're done?

Student B: And then they're done, yeah. But I've recently got into a lot more RPGs like *Shin Megami Tensei 4* on my DS and that's a really long game. It's really interesting because it's one of the older RPGs that's still around. And then I play *Bravely Default* occasionally. I always play *Pokemon,* too, that goes without saying.

Researcher: I've heard great things about *Bravely Default*.

Student B: It's a great game, it's a lot of fun. The art in it is really cool with the colors they choose to use, and it's really good the way they did the turn-based gameplay, I like that a lot more and others. I feel like that unless it's a racing game where there's a lot more reflexes, it shouldn't be half-reflexes and half-game, I feel like it's better to go for the extreme of one instead of fussing with the middle-ground. It's a cool game.

Researcher: Do you tend to think about some of the games you play or the characters when you're working on projects for school or even outside projects? Do you remember working on something and something from a video game pops into your head?

Student B: I've thought about that a lot. I don't really know. I think one of the interesting things about video games is, a lot of people see art exhibits as hard to do- coming from someone who lives in the D.C. area- but when you play games you get- there are some pretty high-quality artists that were on the teams for those things, so you get to see a free window into their creative process by consuming the games they make. So you get to learn a little bit about how people do things if you pay a lot of attention to it. But again, other people can play the game without noticing stuff, but I feel like if you play them long enough you get a finer appreciation for it. Kind of like if someone watches movies so much that they learn about shots and framing. I feel like it's a little like that. I remember I went to a camp where I got to program a game [I skipped this story too since he didn't really go anywhere with it]

Researcher: Can you think of any real world situations where you've used a skill that you might have learned in a video game?

Student B: I don't know. I think it's good for reflexes. Like, anticipating patterns. I think one of the best things about video games is the anticipation for patterns, I think it helps stimulate some of those. And you learn how to tie together a continuity almost, like certain actions, so you get a better sense for when things are about to happen. For track, a lot, you can get an easier lead, for when you want to go do a race, you get better reflexes because you get better tell signs for when the gun is about to go off. I also think it can probably help for sports too. If you see a movement enough times, you learn how to anticipate certain movements and a lot of things in basic physical activities have a lot of anticipatory motions. Not like I can fight or anything!

Researcher: I don't know, you look like a fighter to me.

Student B: Yeah, maybe.

Researcher: How about in classes or anything like that? Do you ever think of in math, science, history, when you are taught something, do you ever think of something you've learned from a game that might be a memory trigger?

Student B: I think about all kinds of stuff in class. I might, I don't know. I think about a little bit of everything. I kind of daydream a lot. Sometimes I think of ideas and how they might make a cool game. I don't know. I don't think too frequently. I'm not too sure.

Researcher: That's okay. It's kind of a meta question. Do you think of yourself as a gamer?

Student B: I think less so than earlier, because I play less games recently, but I need to play more.

Researcher: You need to finish your senior year.

Student B: Yeah, but it's kind of already finished. But yeah, I do think of myself as a gamer. I enjoy playing video games. I can beat people who don't play video games very frequently. I think that counts as somebody who plays games. I also like the minor competitive aspect, too. I enjoy things with a little bit of a competitive edge.

Researcher: Do you play a lot of MMO, or online?

Student B: No.

Researcher: So you're mostly competing against the AI?

Student B: Yeah, the AI. I play against people I know. I've never really gotten into the MMO, because you use your computer for that.

Researcher: Doesn't the PS3 have an online component.

Student B: It does, but I never played PS3, I never saw the point in upgrading consoles because that's definitely a huge marketing scheme. All the older games are fine and there's a lot of good ones out there, if you don't really care about graphics. Graphics are such a huge part of games, and now there are inconceivable differences to the human eye and it's like "meh". But then you play the one game that's blocky that you played five years ago and it never really got old. So I still enjoy the games that I have.

Interview Transcription 3

Researcher: Okay, it's recording… so, how old were you when you started playing video games?

Student C: I was… I think twelve.

Researcher: Twelve? Okay. Well, do you remember what the first game you played was?

Student C: I think it was a… browser game called *Lord of Ultima*, which is… uh, I guess it's a MMO.

Researcher: Okay. I don't know what a browser game is.

Student C: You play in Chrome or Internet Explorer, you [open up a tab?]

Researcher: Okay.

Student C: It's similar to a downloaded game but everything's on an offline server. Err, off-site server.

Researcher: Okay, so you don't have to worry about lag or stuff like that as much?
Student C: Yep.

Researcher: Nice. Um, what are your favorite games now?

Student C: Um, right now, probably *League of Legends*, uh… *Guild Wars 2, Smite…*

Researcher: Okay. Now, I've had some, I've asked a couple different people, do you think *League of Legends* is an RPG?

Student C: I think for a very small part of the community, it is.

Researcher: Okay.

Student C: But I don't believe in general that's the case. Like, people might want to play-act that they're characters or whatever… there's really not room in the game itself for role-playing.

Researcher: Okay, so it's not really a story-based kind of world?

Student C: No I mean, you have the lore, which is released on a separate note, but of the people I know, myself and a couple of people actually follow that, and it's not relevant to actual playing. You don't gain anything from the RPG aspect.

Researcher: Okay. That's interesting. So, you think of yourself as a gamer?

Student C: I would say so, not super-serious, but it eats a lot of my time.

Researcher: It does that, doesn't it? How do you think RPGs are different from other types of games? Other types of video games?

Student C: Um, I think they appeal to a certain kind of gamer because you have like, I dunno, big *Starcraft* geeks or something. They're not super into gore or the RPG aspect, they're like, all about numbers and beating the other guy. And at that level it's kind of basically a sport. But RPG makes it more like a fantasy book or something like that, so it's actually entertainment. Still retains aspects of competitive play.

Researcher: So can you think of any real world situations where you might have used a skill you learned playing video games?

Student C: Okay, um… one that comes to mind quickly is… sports. Uh, certainly not… games like football I don't seem necessarily [can't make out this word] further. I do- I do fencing, and it's about being at a certain level very fast with your hand-eye coordination but also with just like… getting in the zone where you're thinking quickly, you're involved. You can do that in a video game if you practice it a lot and you're better at it. I think it's a valuable skill.

Researcher: Okay. Um, let's see if I had any other questions. So what do you, um, do you think that video games could make people more creative?

Student C: I think so. Yeah. Because… a creative person isn't necessarily being entirely original. You have… every idea, or most ideas anyway, that come about are based on other ideas and so… for people who have had a chance to be exposed to a lot of different lore, like RPG-style games, or even competitive games, they get a sense for a whole different worldview and they can apply that to any aspect of life and their own creativity.

Researcher: Do you ever find yourself doing that?

Student C: I think so. I mean, I like to write. So, I don't really know where I'd be if I hadn't had reference points, 'cause like, I might be able to read a fantasy novel and that gives me an idea of, like, a setting, but if I didn't play video games then I wouldn't see that nearly as clearly, because they give you a template.

Researcher: Even Shakespeare used other people's ideas.

Student C: Yeah.

Researcher: Okay, um… let's see… you've answered a lot of my questions so I'm sort of jumping around a little bit here. So you said the setting and stuff influences you when you're writing. Do you think the characters themselves influence you?

Student C: That's harder to say for me, because I think a lot of characters are kind of typesets, uh, and video games play off of that. Like the warrior class, the paladin class, uh… they all have kind of typical character traits. So… in terms of like, I'm not really sure.

Researcher: Okay, that's fine. Do many of your teachers know you're a gamer?

Student C: I think some of them do, but it doesn't really affect my interaction with them.

Researcher: Do you have any idea that they- the ones who do think, do they talk about video games with you, or…?

Student C: Um…

Researcher: Or do they say, like, shut it down if you bring up anything?

Student C: It's not so much as they shut it down. I find a lot of, um, people who are interested in video games are older, like… the Xbox games, or kind of… or console games, I'm not sure if that's because it's closer to the games that were out when they were younger, but there's not that much overlap between computer games and what they like.

Researcher: And you're mostly PC?

Student C: Yeah, I'm mostly PC. I think a lot of people are. I know that they still play Xbox for an hour or two that you want to play with… you don't necessarily go to the console.

Researcher: Okay, well, thank you very much. I appreciate it.

Student C: No problem.

Interview Transcription 4

Researcher: Okay, here we go. So, I just want to ask you a couple questions about video games in general, um, how old were you when you started playing video games?

Student D: Well, um, me and my brothers, we'd always just go downstairs and play video games so I was probably… four or five, um, I dunno, that's probably when I started playing with my brother and his friends.

Researcher: Is your brother older?

Student D: Yeah, uh… both my brothers are older. One's 21, one's 19.

Researcher: Okay, and how old are you?

Student D: Uh, I'm 14.

Researcher: Okay. So, what kind of uh, what game systems were you playing on?

Student D: Uh, back then it was the Xbox, the original one, and the PS2.

Researcher: And what type of games?

Student D: Um. I dunno, we'd play *Madden*, um, and *Halo,* and just a bunch of games.

Researcher: Okay. Do you think of yourself as a gamer?

Student D: Uh, I'd like to. I might not be that good, but I enjoy playing all types of games.

Researcher: Do you have to be good to be a gamer?

Student D: You don't have to be good, but it's… preferable to be good, so you…

Researcher: So you can brag about it? (laughs)

Student D: So you enjoy winning more than you lose.

Researcher: Mmhmm. Um, let's see what my next question is… So, what, um, what RPG games do you play?

Student D: Um, well. I play *World of Warcraft,* and I've played for…

Researcher: Hold on one second.

(Recording stops and restarts after the interruption.)

Researcher: Okay, you played *World of Warcraft?*

Student D: Yeah, uh, I think I first got into when I watched a *South Park* episode about *World of Warcraft,* so I got it for Hanukkah, and that was probably around when I was six or so…

Researcher: Oh, okay. (laughs)

Student D: So really, I didn't really understand what the point of the game was, so I think I quit about- after a few days.

Researcher: Yeah.

Student D: But then uh, I think I came back a few years later, and since then it's been on and off since… well it's been… about on and off for five years.

Researcher: Yeah. Do you play with anybody, or, like with people you know, or do you play on a- what type of server? Tell me about that.

Student D: Well, um, I play with a few of my friends, but mostly I play with my guildmates, um, at one point we switched from one server to another and basically that was just because our server was dying. I play on a PVP server, which is when you mostly… you can go around and, uh, kill other enemy players, but on our server it's mostly one faction, so it's hard to find other players, and when you do, you just kill 'em, but…

Researcher: They're a little outnumbered?

Student D: Yeah.

Researcher: Do you play, uh, Horde or Alliance?

Student D: Alliance.

Researcher: Okay.

Student D: I'm more a fan of organized cities; I'm not really into the jumble of buildings.

Researcher: Okay. Are most of the people in your guild about your age, or is there a big spread?

Student D: Uh, there's a big spread. Um, our guild master, um, he and his wife, I think are around 40 or so, but they've been, they're really nice people. They've just been like- they help out everyone else in the guild.

Researcher: About how many people do you guys have?

Student D: Um, our guild number I think is 230, but like different people- it's probably around 70 or so, just because of different people's alts and stuff.

Researcher: That's a lot. Uh… let's see, so what draws you to games like *World of Warcraft?* What do you like about that that's different from other types of games?

Student D: Well, um, what drew me to *World of Warcraft* more than other MMORPGs, is more of the fact that, um, it's just been a long standing game that people have been

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playing and, um, unlike the newer games that try to invent different ways, it's more of the old style where, um, you have a set base of moves- like, you can't click to attack, you have to use the moves instead, um, which really just enhances the skill level that you need to have to be able to uh, move forward and advance in the gameplay.

Researcher: How about MMORPGs versus games like *Madden*?

Student D: Um, well, I enjoy playing- uh, *Madden* when it's more in the friendly competition between me and my friends, but when it comes to really gaming I don't enjoy playing sports online games because, um, it's just not really my thing. I enjoy more of the competitions than um, then just uh… constantly doing the same plays over and over again.

Researcher: You get to be a little more… do some different stuff and…

Student D: Self-aware, and… aware of your surroundings, and uh… adapting to… just what you need to do.

Researcher: Can you think of any real world situations where you used a skill you learned from a video game?

Student D: Um…

Researcher: A skill or a concept.

Student D: (pause) No.

Researcher: Have you ever been in class and the teacher was saying something and you were like, "Oh, that makes me think of this thing from *World of Warcraft*" or any other game like that?

Student D: Not really. I try not to think of video games when I'm in school in order to- in order to do well.

Researcher: How about in art class? Do you ever use ideas from characters or games for your art? Does it inspire you?

Student D: Well, in art class, I usually just do what the teacher requires, but at home I occasionally just draw things from uh… occasionally I'll just draw weapons. I'll occasionally draw weapons or armor sets from *World of Warcraft*.

Researcher: Okay. So, you mostly do drawing?

Student D: Yes.

Researcher: What about for other creative things like writing, like when you're writing creative writing stories or anything like that? Do you think that video games inspire you?

Student D: Um… not really. Um, because I also try to write in my free time, like… I have a one or two page story I've been writing, but that doesn't really have anything to do with video games, it's more of just my reading genre, which I also enjoy reading.

Researcher: Oh, okay. What genre is your reading?

Student D: More like fantasy novels than others, but I also read like, the law, and law, mystery and those type of things.

Researcher: Cool. I think you answered all of my questions, so thank you very much, I appreciate your help.

Interview Transcription 5

Researcher: Okay, there we go… So, when did you start playing video games? Hold old were you?

Student E: I probably started playing when… I wanna say I was about 7 years old. Um, my family I think got- got me a, uh, one of those, uh, Game Boy Advances, or I think it was actually a Game Boy Color, it was the first thing I ever had, and, um, they originally got- got it for my sisters and then my sisters quickly decided they didn't care for it. So I inherited it. Along the way- somewhere along the way we got a PS- uh, like a Playstation? And we had a bunch of, like, family games that me and my sisters would play each other. So, I want to say about 7 years old.

Researcher: Okay. What were the first games you were playing?

Student E: Uh… it was a lot of these, like, uh, very early… like I said, I inherited the Game Boy, so I think the first one was a *Mary-Kate and Ashley Adventure* game.

Researcher: (laughs) That's awesome.

Student E: Because it was something that I think my sisters had seen- the movie that just came out with them, and they were like, "Oh, this is great!" And then, after that- so that was my first game, and after that we had a bunch of, like, I think the first game my sisters played together was a game called *Fusion Frenzy*, which is kind of like *Mario Party*, like, a primitive form of it.

Researcher: Okay, cool. Do you think of yourself as a gamer?

Student E: I'd consider myself one.

Researcher: Are most of your friends gamers, or do you have a mixture?

Student E: I have a pretty good mixture. Um, it's funny, I'm probably a little arrogant for thinking this, but I consider myself three parts. I'm part jock, part geek, and part nerd, and I tend to have friend groups that span all three, because I have a lot of- like, uh, a good friend of mine is [Carl?] Kennedy, we're both kind of gun nerds. Then I've got some good friends who, uh, who play video games, and some other friends who just play sports.

Researcher: Are your gamer friends more online or do you play with them here?

Student E: Um, I've actually got, uh, primarily physical friends that I play online. I have a few online friends that I don't think I've ever met in person, but very few. I think I have, like, two or three, but then I have about a solid core of about fifteen guys that I play with on the internet.

Researcher: Do you play more console games or PC?

Student E: Um, for a long while I played, uh, I played mainly console, but most recently I got a job and ended up getting, like, a monster PC, so I now start to split my time evenly between the two.

Researcher: What games do you mostly play? What are your top games that you play right now?

Student E: Top games right now are, um, well, the number one game I play is, uh, what's called a MOBA: a massive online battle arena, which is an online game that you play with about nine other guys and…

Researcher: Like *League of Legends?*

Student E: Yeah, exactly. Uh, and, so I play another one of those called *Smite*, and then I play *Pokemon* actually, a lot, because it's a game I can carry with me and we've actually got a pretty solid core of guys here at school who actually play *Pokemon,* so we're always kinda bringing our DS's and playing with each other. Then, the third game I guess I play right now is *Battlefield 4,* which is a first-person shooter.

Researcher: Okay. What about all-time favorite games?

Student E: All-time favorite games. Um, probably my most favorite game ever was a series called *Supreme Commander*, which was a RTS, and I loved that game, and I loved the sci-fi, and, uh, it's a, I'm a huge geek for a lot of the technology and ideas behind that. So I really liked *Supreme Commander,* and then… I guess my favorite first-person shooter has been *Battlefield 4* again because it kind of lets me geek out a little bit while still allowing me to just have fun.

Researcher: Do you play any RPGs?

Student E: Uh, I do. I play *Skyrim* occasionally. It's not my favorite genre just because I have a little bit of a- I have a little bit of a patience issue where, it'll be great up until the time where I'm like, "Okay, I need to grind to level 50". [frustrated sigh] so, I still enjoy *Skyrim,* you know, I actually go back to it from time to time, but it's not as heavily played as a lot of other games.

Researcher: What do you think draws you to video games?

Student E: Well, I think it depends on which one I'm enjoying. Um, for MOBAs and for FPS's, it's a lot of the times, it's just I want something to draw my mind away. When I'm playing a MOBA- *Smite*- I'm primarily there because it's fast-paced enough, but it's not… I don't feel like, uh, I'm not trying to vent, I'm just trying to relax. When I play my first-person shooters, typically, I'm in a little bit of a more venting mood. Uh, like when I play *Battlefield*, I'm either playing with my best friend, who I've actually been friends with since first grade, we both play *Battlefield 4*, and, so I'll play with him online, but uh, when I go to it, I guess on my own accord? It's primarily because I've got either a lot of energy that day, or I'm kinda venting. And then when I play *Pokemon,* it's primarily for, like, a social- social reasons. It's more of a social game because you have to trade, you have to- whenever you want to battle you have to be right next to the guy. So, uh, it really depends on the game. RPGs, it's typically because, uh, I'm just kind of looking for something to, I don't know, intrigue me, or I'm a little bored, I guess.

Researcher: What do you think makes RPGs different from other kinds of video games?

Student E: I think it has a lot to do with the pacing, and- because a lot of video games, their entire, I guess, cult following usually is guys who prefer certain paces to games, and RPGs definitely get their independence from other genres due to their longer pacing, more time spent, um, usually better-crafted story. It's less about core gameplay and more about the idea of the journey, to interact with it. So I think that's really what sets it apart, is that you spend more time there, you're engrossed in the story, you're making decisions that impact the story- all of a sudden you need to decide to kill one character or save

another, or fight with this group instead of this group, and alter the course of the story and go through the branching tree limbs and hopefully you end up at, I guess, the ending you want. And, so I think that- many other games have leveling-up systems, first-person shooters recently adopted leveling up systems for their, uh, for their multiplayer, where the higher level you get, the more guns you unlock. Um, and there are other examples everywhere- in MOBAs, obviously, like *League of Legends* has leveling up built-in. But what really defines it I think is that more story-centric gameplay and really engrossing you in and getting you excited for that.

Researcher: Can you think of any real-life situations where you used skills or information learned from a video game?

Student E: I don't think I particularly have, because I'm kind of a gun nerd, a lot of stuff actually filters over. My aspirations is to hopefully become a defense contractor, and part of, I guess, the bleed over from video games is whenever I see something I'm like "That actually could be applicable in the real world". All of a sudden I start spinning off into ideas, like; I had an idea about plasma rifles. Like, what would be the need for those? I spent actually a good solid two hours just sitting in my room thinking about plasma rifles. I was like, "Okay, well what's the concept of plasma?" I looked it up online and was like, "All right, so this is why plasma is you know, you can weaponize it", and I went through, thought about it more. So, I wouldn't say I guess I've had an experience where all of a sudden I'm in a crisis situation and something in video games has helped me out. I actually do know of one or two stories where there was a video game series called *ARMA*, where the developers decided that they wanted to go hyper-realistic. Where they-the coding in it has whenever you shoot another player, or you yourself get shot, it registers where on the body it hits and it registers a casualty, um, indicator, so if I get shot in the leg, my leg is broken. All of a sudden I need a very specific type of bandage in order to help mend that to set it, and a certain bandage to stop bleed, stuff like that. I actually have heard of a few instances where I think somebody was hit by a car, and the gentleman next to them played *ARMA,* and so he immediately knew, like, "Okay I need to get gauze to stop the bleeding; I need to get something to help set the leg". So he immediately went to work with what limited knowledge he had, and he obviously didn't try to do anything too extreme I don't think, but I think he ended up, uh, saving their leg, because they said if he hadn't been there, they would have had to amputate it.

Researcher: That's impressive. Do you- are you taking any art classes here?

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Student E: Uh, no, I'm actually not. I'm not tremendously an artist. Unfortunately I have disgrafia, so my output disorder is always kind of made it very frustrating for me to try to draw.

Researcher: So did you take music or drama?

Student E: I actually, so I sang in chamber singers for two years and actually sang in the Denizens. Thankfully, my family's voice is not too bad.

Researcher: Thank you, you answered all my questions. Let me just double-check, yeah I think you got all of them.

Interview 6 (Email)

1) My first video game was probably Pokemon Crystal on an old Gameboy Colour when I was like ~6-7

2) I consider myself a gamer, but I'm more into strategy games than violent war-esque games (Call of Duty, Battlefield, etc)

3) I find the sense of completion very very satisfying. I'd honestly rather solve a near impossible Portal puzzle than get an A on a bio test. I just don't get the same feeling of accomplishment.
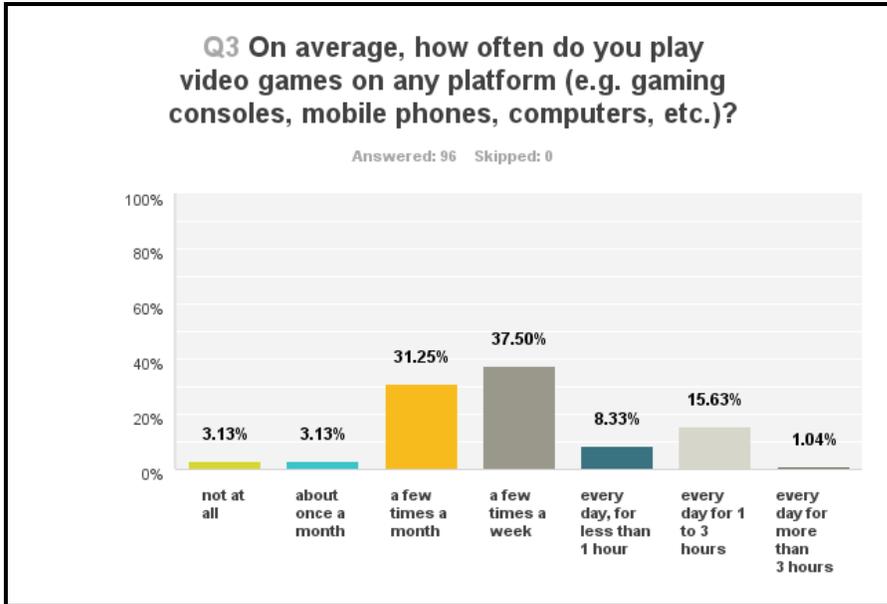
4) RPG's are often hit or miss with me. Some games like Skyrim I absolutely loved! However, games like WoW (too many fetch quests) or Final Fantasy are just not that appealing to me. Overall, I think RPGs are a lot more quest based, whereas FPS's are mission based. Also, most RPGs are in third person. I like RPGs for the most part, but I hate it when developers add quests just to make the game longer.

5) First of all, pretty much everyone has played a videogame of some sort, whether it be Pokemon, COD, or even Minecraft! Video games are a great thing to start a conversation with. As for a real world applications of games I play, I must say I have become a lot more patient since playing Minecraft. Although it sounds stupid, I played minecraft 2 weeks after it was first released as an in browser java game on TIGSource Forums, almost 5 years ago. In my time playing, I had to deal with hundreds of stupid bugs that would completely ruin my last 4+ hours of work. Most notably, when I cranked out 8 hours over one weekend building a massive mansion, only to find on monday that it had randomly moved into the middle of the ocean. Fortunately, I had saved before the impromptu move, but I came close to a heart attack. I also learned more practical things from Minecraft. By the time I was in 7th grade, I thought I'd done everything there is to do, so I decided to try and mod the game. My first attempts ended in game crashes, and at one point, even a BSOD (http://goo.gl/dc9fKC). That summer though, I was determined

to learn at least basic Java. At the beginning of 8th grade, I finally was fluent enough to make pigs 50 feet tall, change the colours of blocks, add some new items, and eventually I was even able to make a custom client. Anyways, one thing led to another, and now I can code in Java, make some basic programs, set up servers, and build computers. A simple little block game took me one step deeper into technology as a whole, and I can never go back.

Appendix C

(Table A)

Q3 On average, how often do you play video games on any platform (e.g. gaming consoles, mobile phones, computers, etc.)?

Answered: 96   Skipped: 0

not at all	about once a month	a few times a month	a few times a week	every day, for less than 1 hour	every day for 1 to 3 hours	every day for more than 3 hours
3.13%	3.13%	31.25%	37.50%	8.33%	15.63%	1.04%

(Table B)

Q4 How much of that time is spent playing RPG or MMORPG games (World of Warcraft, Skyrim, Final Fantasy)?

Answered: 47   Skipped: 0

a few hours a month	about 1/4 of the time	about 1/2 of the time	most of the time	all of the time
42.55%	17.02%	17.02%	17.02%	6.38%

(Table C)

Q3 On average, how often do you play video games on any platform (e.g. gaming consoles, mobile phones, computers, etc.)?

Answered: 96   Skipped: 0

not at all	about once a month	a few times a month	a few times a week	every day, for less than 1 hour	every day for 1 to 3 hours	every day for more than 3 hours
3.13%	3.13%	31.25%	37.50%	8.33%	15.63%	1.04%

(Table D)

Q2 In the past 30 days, which of the following devices have you used to play video games? (Please select all that apply.)

Answered: 96   Skipped: 0

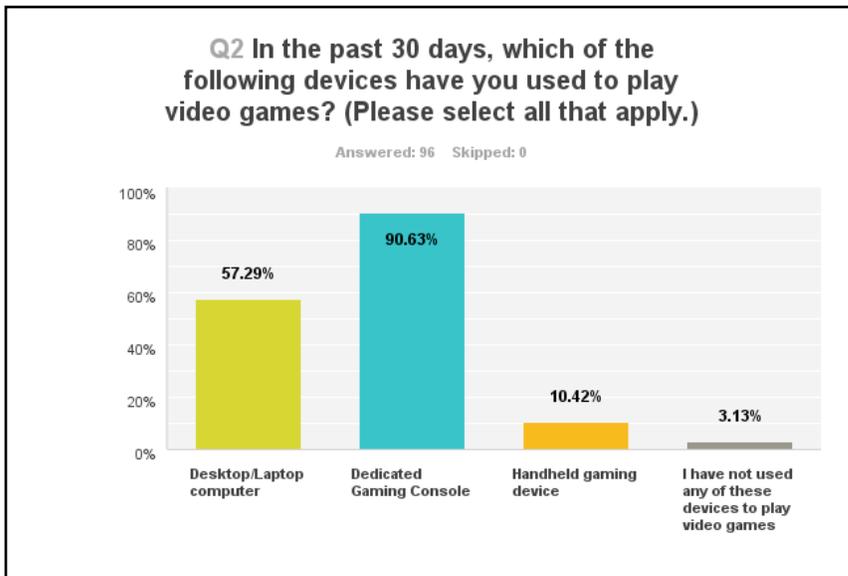| Desktop/Laptop computer	Dedicated Gaming Console	Handheld gaming device	I have not used any of these devices to play video games
57.29%	90.63%	10.42%	3.13%

Key Words:

Role-Playing Games, Creativity, Identity, Video Games, RPGs, Art Education, Visual
Culture