Boys and their Toys: Video Game Learning & the Common Core

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Abstract: Traditional K-12 public school culture seems to be alienating and distancing for many boys today (Martin 2002). Carr-Chellman proposes that this crisis is due to the rejection of boy culture (2011). Gaining acceptance of games in traditional classrooms has the powerful potential to change the culture of schools to one that is more welcoming to boys' ways of being, but most teachers find games without sufficient curricular merit to spend the necessary time learning and utilizing games effectively. This study sought to understand the potential interaction between commercial-off-the-shelf (COTS) video games and the Common Core State Standards (CCSS) as reported by boy gamers. In this study, data was gathered through phenomenologically based semi-structured interviews with boys, aged 10-17. Our results indicate specific connections between COTS and the CCSS, further supporting such theoretical works from Prensky (2006) and Gee (2003).

Background of the Project

We are facing a crisis in education due to the rejection of boy culture and the alienation of boys' ways of being in traditional school experiences (Carr-Chellman, 2011; Martin, 2002) Video games are a large part of boy culture (Burrows, 2013; Watkins, C., 2009; Jones, G., 2008) and may offer a tool to re-engage boy culture inside of traditional school culture (Carr-Chellman, 2011). Many statistics confirm that boys are at higher risk across their educational experiences than their female classmates (Mortenson, 2011). Mortenson's research found that for every 100 girls:

> 250 boys are suspended from public elementary and secondary schools
> 335 boys are expelled from public elementary and secondary schools
> 217 boys are diagnosed with a special education disability
> 62 American men earn a Master's degree (Mortenson, 2011)

In an ongoing study Petner, Vashaw, and Carr-Chellman, looked at teacher attitudes toward violent video games and found that teachers were banning gaming, writing or talking about gaming, using gaming in art or other traditional school outcomes (Carr-Chellman, 2011). Primary reasons for this rejection included violence, competition, and individualism in the classroom that is associated with game integration. Because of a link between game culture and boy culture, we are concerned that rejecting games could be a masked rejection of boy culture. Understanding teachers' perceptions of gaming is only a part of the picture—we need to also understand perceptions of boys who game as well,   We wanted to illustrate the link (if any) between COTS gaming and traditional learning, in the hopes that teachers, administrators, and parents might perceive a stronger justification for utilization of gaming in the traditional curriculum.. As a result, this study seeks to document the ways that COTS games contribute to traditional learning experiences, and to map those learning experiences directly onto the CCSS where applicable ("NGA & CCSSO", 2012). This study asserts that use of COTS games, where aligned with traditional learning outcomes, is possible in traditional classrooms and may welcome boys to a re-engagement of their learning.

This is the first phase of a larger interpretivist research project, which extends theories and prior research aimed at better understanding the contribution of video games to boy learning. Studies conducted by other researchers have developed strong theoretical perspectives into the value of video games in multiple learning environments (Gee, 2003; Prensky, 2003; Squire, 2006). Our research question is: How do boys describe their learning within video games? More specifically, this study seeks to explore the extent to which boys who are using COTS games describe learning traditional knowledge and skills from gaming.

Methodology

Participants

All participants were boys at a rural eastern school district, aged 10-17, in middle school or high school. These were typical male students with varying academic backgrounds and involvement in sports. These participants were chosen because they enjoyed playing video games and were willing to talk about their gaming experiences. Through one of the researcher's established relationship as a coach, we were able to identify appropriate partici-

pants for the study that we knew would be available and were embedded in the boy gaming culture. While this is a sample of convenience, it represents relatively average boys in this district.

Design and Theoretical Lens

Because our goal was to understand the lived experiences of boy gamers in relation to their learning, we decided to use a phenomenological approach (Groenewald, 2004, Lester, 1999, Moustakas, 1994). The theoretical lens utilized for this approach was cultural historical activity theory (CHAT) (Roth & Lee, 2007). There has been growing interest over the past three decades for this framework that encourages researchers to consider cultural conditions within a system that can be utilized to improve itself (Roth & Lee, 2007). CHAT theorists consider a variety of concerns such as the poverty or culture of urban students' home lives from conditions of schooling, consideration of the curriculum, problems of learning, or learning to teach under difficult settings (Roth & Lee, 2007). Furthermore, CHAT is essential for designing constructivist learning environments, which are driven by activity (Jonassen & Rohrer-Murphy, 1999). The CHAT framework allows us to examine *activity* through a designed experience (Squire, 2006), which is our direct interest with boys and video games.

Procedure

Data was gathered using individual semi-structured interviews (Drever, 1995; Seidman, 1998). During this exploratory phase an initial interview was collected from each of 12 respondents, 4 in middle school and 8 in high school over a two-day period. Each interview lasted approximately 15–20 minutes and was conducted in a public space at the high school or middle school. All interviews were audiotaped and used a protocol that included student experiences with gaming, and participants' thoughts on learning through the use of video games. There were questions such as, "What games do you play? How much would you say you play games in a week (# of hours)? Do you feel you learn from games? What kinds of things do you learn in gaming? Tell us about your experience gaming." We recognize that our participants may not be able to recognize learning from games. So our protocol questions were designed to allow us to interpret their gaming activity experiences into traditional learning outcomes.

Data Analysis

Data analysis was conducted based on the interview data, which was transcribed from the audiotaped files. CHAT guided the data analysis. Jonassen and Rohrer-Murphy describe activity theory as, "…a powerful lens to analyze most forms of human activity". They go on to say that activity focuses on the interactions between human activity and consciousness within relevant environmental contexts (Jonassen & Rohrer-Murphy, 1999). The Data Analysis took place in two layers. The preliminary analysis was done to identify and codify repeated activity, ideas, and themes surrounding learning. The research team developed a comprehensive coding framework utilizing a CHAT lens in a continuous iterative process. This included the acquisition and use of vocabulary, transfer of knowledge to the real world, or the ability to analyze key ideas. The team applied some CCSS standards to develop codes to identify *products (e.g. instances of learning events)* (Jonassen & Rohrer-Murphy, 1999) that occur as a result of the activity of video game play. Using this coding framework the team performed individual open-coding on the data. The team then came together to discuss and consolidate the emergent codes collaboratively, to ensure consistency. Upon completion of the analysis, several reliable themes emerged from the data.

In the second layer of analysis, our goal was to separate learning accounts based on games, and find out the extent to which these accounts overlap with the CCSS. For this portion of our analysis we used a modified Phenomenological Thematic Analysis (PTA) with a focus on bracketing for each game found in our prior analysis (Moustakas, 1994). First we identified each game played per participant then cross-referenced them with the group. This allowed the team to identify the games that were played by the group of participants. We then applied a phenomenological reduction (extracting textural descriptions), imaginative variation (extracting structural descriptions) and finally a synthesis (textural-structural description) for each game found in our prior analysis (Moustakas, 1994). The focus on bracketing allowed for the team to continuously reveal and scrutinize our own presuppositions within our interpretation activity. This allowed the team to deeply analyze the thematic content that emerged by game. Lastly we used the textural-structural data to identify learning instances that mapped to the CCSS ("NGA & CCSSO", 2012).

Results and Discussion

Our findings show that the participants were able to discuss their learning through their discourse illustrating powerful outcomes from gaming. Although some participants were unable to give substantial information on transfer and had difficulty articulating some learned skills, this may be due to their limited abilities to understand how learned skills transfer or because our interviews were limited in both scope and duration. Despite this, the re-

search team saw evidence that learning was indeed happening. The most common skill identified by participants was Vocabulary Acquisition and Use. Leveraging boys' existing interests in games revealed engagement in literacies (Steinkuehler & King, 2009). They described this acquisition as a result of readings from the just-in-time instruction throughout the game and external resources. This further supports the meaning making process considered by Meaning as Action ("Video Games", 2013b). Such is the case with Blake: *"If you don't read it you don't get it. That's you know…in in World of Warcraft you are running around aimlessly without knowing what you gotta do. And you have to read every single sentence and tear it apart to figure out every part of the quest."* This points us towards <u>CCRA.R.1 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.</u> Boys were able to directly interact with the content as they used it to navigate through gameplay ("Video Games", 2013b). Participants were able to interpret and give detail on various vocabulary words such as obsidian, tariffs, cardinals, as well as community language associated with the military, football and historical accounts. The boys expressed understanding of both real world concepts and community language within the games. One respondent recalls, *"…like well one day my teacher was teaching about obsidian and in Minecraft there's obsidian and I already knew that I already knew that it was like a lava rock".* Examples like these align with <u>CCSS.ELA-Literacy.CCRA.L.6 Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.</u> These are but two examples of the kinds of alignment we found in talking with boys about their learning in games.

Mapping to the CCSS

We have found that there are several areas where the COTS learning overlap with areas of the CCSS: (See Table 2). In particular we found ties to the "English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects" standards. The boys discussed their ability to identify key Ideas/themes, analyze key ideas, interpret words, phrases and concepts, integrate knowledge, comprehend and collaborate, verbally present knowledge, acquire and use vocabulary, problem solve, set goals, analyze data through strategic, extended and evaluative thinking, and transfer knowledge into the real world ("NGA & CCSSO", 2012). (See Figure 1) Games Played Included: Assassins Creed (AC), Baseball (MLB), Battlefield (BF), Borderlands (BORD), Call of Duty (CoD), Diablo (DIAB), Driving Games (DV), Halo (H), Little Big Planet (LBP), Madden (MAD), Minecraft (MINE), NBA2K (2K), NCAA Football (NCAA), Phineas & Ferb (PF), Pokémon (PK), Portal (PORT), Skate (SK), Skyrim (SKY), StarCraft (SC), UFC, World of Warcraft (WOW).

English Language Arts Standards >> Anchor Standards >> College and Career Readiness Anchor Standards for Reading	AC	BF	BORD	CoD	MAD	MINE	NCAA	PF	PK	PORT	SKY	STAR	WOW	All
Key Ideas and Details														
CCSS.ELA-Literacy.CCRA.R.1 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.	▪						▪	▪			▪		▪	
CCSS.ELA-Literacy.CCRA.R.2 Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.	▪		▪						▪			▪		
CCSS.ELA-Literacy.CCRA.R.3 Analyze how and why individuals, events, or ideas develop and interact over the course of a text.														
Craft and structure														
CCSS.ELA-Literacy.CCRA.R.4 Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.														▪
CCSS.ELA-Literacy.CCRA.R.5 Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.														
CCSS.ELA-Literacy.CCRA.R.6 Assess how point of view or purpose shapes the content and style of a text.														
Integrate Knowledge and Ideas														
CCSS.ELA-Literacy.CCRA.R.7 Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words														▪
CCSS.ELA-Literacy.CCRA.R.8 Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.														
CCSS.ELA-Literacy.CCRA.R.9 Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.				▪		▪								
Range of Reading and Level of Text Complexity														
CCSS.ELA-Literacy.CCRA.R.10 Read and comprehend complex literary and informational texts independently and proficiently.														

Figure 1: Learning Mapped to Common Core Standards.

Additional Findings

Additional findings were related to both cognitive and non-cognitive skills, such as grit (Duckworth, Peterson, Matthews, & Kelly, 2007), which may not relate directly to the CCSS, but contributes to learning and development in other ways. Our findings show several areas where these COTS games aid in learning 21st century skills. The following is a segment of a chart, showing some of the learning results identified by game type. (See Table 1).

Games Played	Learning
Assassin's Creed	Theme Identification, Critical Reading, Language Acquisition (Strong Community Language), History, Development of Grit
Diablo	Critical Reading, Strategic Thinking, Strong Community Language
Madden	Development of Grit, Problem Solving, Extended Thinking, Collaboration, Communication, Strong Community Language, Manual Dexterity, Hand/Eye Coordination, Information Literacy
Minecraft	Strategic Thinking, Strong Community Language, Information Systems Technology, Engineering, Math, Resource Management, Information Literacy, Collaboration, Communication, Digital Citizenship
Skyrim	Strategic Thinking & Decision Making, Development of Grit, Strong Community Language, Information Literacy
World of Warcraft	Critical Reading, Theme Identification, Collection of learned skills, Resource Management, Information Literacy, Strong Community Language

Table 1: Learning by Game

More generally, the respondents reported that games gave them the opportunity to accomplish tasks and goals along a performance based learning system as opposed to a time based learning system (Squire, 2006). Gee's *Psychosocial Moratorium* attributes to gamer's ability to perform and explore appropriated risks, in an environment where real world consequences do not exist (2003). The *Psychosocial Moratorium* in combination with support from the *Affinity Groups* (Gee, 2003) built hopefulness and fostered optimistic outlooks towards challenges (McGonigal, 2011). Ultimately these gaming characteristics help support the development of "grit" (Duckworth, Peterson, Matthews, & Kelly, 2007; Gee, 2009) which is an essential element in success in almost all video gaming today (Ventura, Shute & Zhao, 2013) and is being increasingly pointed to as a success factor in traditional learning as well. One participant explains that it frustrates him when he is not successful in game. So he takes a break and still continues to work through, "*I get mad that I can't do it. I'm a kid who likes to be able do everything…when they make it so hard that it takes 100 tries to do it by the 20th try I'm just like I'm done I shut off the TV and walk away…I shut it off and come back later*" (Blake). Our findings indicate that there is evidence of boys developing grit through gameplay which we feel warrants future research as businesses increasingly seek future leaders that can demonstrate such characteristics (Beck & Wade, 2004). Our findings suggests that failure can be used as a motivating factor towards problem solving strategies in gaming, but is seen as punitive for most boys in traditional classrooms. The data showed that problem solving skills, both individual and collective, were the second most commonly described learned event among these young men. Game success was not possible without the intentional and thorough processes included in problem solving (Prensky, 2006). According to our respondents, they like to be challenged, both mentally and physically within the games, which is consistent with findings of others (Lawry, et al., 1995). The following participant describes how he handles failure and develops strategies for problem solving using information literacy practices.

Interviewer: What do you do when you fail or you don't succeed at a goal in the game?

Respondent: um it can be very

Interviewer: Besides get mad

Respondent: yeah, its aggravating but sometimes I'll just turn off my Xbox like I don't even want to play anymore that's how bad I can get, but you feel let down kind of its almost seems impossible sometimes and you never can find out the answer just makes you upset. Its.. It's aggravating.

Interviewer: So when you come upon that situation and its aggravating um and you decide not to turn off your Xbox what do you do?

Respondent: oh I look f…

Interviewer: Do you scream? Do you shout?

Respondent: yeah..um

Interviewer: Do you throw things (laughing)?

Respondent: hmm yeah I definitely can I kind of just like groan at it like just and I try to find other ways to find out what how to surpass that whether or not that be in the video game like YouTube and stuff but yeah you can emotionally it can hurt like you go crazy sometimes depending on how bad the situation is (Austin).

This exchange between Austin and our interviewer clearly displays the frustration that a gamer goes through during gameplay. Austin even demonstrates emotional attachment when he mentions, "you feel let down kind of...". This shows that he is emotionally vested in this gaming activity. Although this activity is so frustrating that he wants to throw things and even scream his investment in the activity forces him to continue which demonstrates both persistence of effort and consistency of goal (Duckworth et al, 2007). With examples such as this we have seen that through this type of development of grit, the our participants have found ways to cope with frustration and maintain consistent goals by utilizing embedded support systems such as YouTube or friends. Learning how to develop grit in this way may help video gamers in the business world. According to Harvard Business School, video gamers are committed to professional excellence, have a strong sense of competence, are comfortable taking measured risks, don't count on fixed organizational structures, and expect themselves to actually deliver among others (Beck & Wade, 2004)

The second type of problem solving that was discovered described participation in affinity groups (Gee, 2003) and required a collective effort of problem solving. One respondent enjoyed playing Minecraft and reported, *"Minecraft, I play that too. Um, I, I play like with friends on a, a, like a multiplayer server and we talk about like how to survive the longest, and like what to do, things like that. I do strategize a lot with my friends"* (Brad).

Researchers suggest that educators could use video games as a model for improving learning environments (Sandford, R., Ulicsak, M., Facer, K., & Rudd, T., 2010; Shaffer, D, Squire, R. Halverson, R. & Gee, J., 2005). While games may offer an important tool for creating a more boy-friendly school culture, it remains important that games are used judiciously and primarily where content is aligned with the gaming learning outcomes. Using a game purely for motivational purposes would be a misuse of the media affordance of gaming. However, using a game to change a culture, build grit, and further specific traditional learning goals, when well aligned, is a powerful and important step toward re-engaging boys in their own learning.

Conclusions

In agreement with other scholars and theorists, we feel it is important to understand the gamers' perspectives in revealing meaning making and learning outcomes from gameplay (Squire, 2005, 2006; Squire & Jenkins, 2003; Gee, 2007). Our findings indicate a wide variety of learning outcomes can be gained from COTS video gaming. This confirms much of the theoretical work, which posits that gaming can lead to specific and significant learning gains (Gee, 2003, Prensky, 2006; Steinkuehler & King, 2009). Problem solving elements are unavoidable while participating in game play (Steinkuehler & Squire, 2012). Players must gather and implement intentional methods and strategies to participate successfully in game play. This requires players to access a variety of resources including, a community of learners, a shared language and problem solving skills. We believe that based on the perspectives these boys have shared with us, COTS deserve further attention and research as a viable addition to the traditional classroom experience. While we recognize the reluctance of teachers to engage in COTS games in the classroom as Petner, Vashaw and Carr-Chellman's research suggests, gaining a deeper understanding of these boys' perspectives may help to overcome some of their objections and further diffuse this powerful innovation. While more research is needed to gain deeper understanding of the potential impact of the inclusion of gaming as an educational tool; we believe that COTS gaming has the potential to meet educational aims while including and engaging boy culture in the classroom.

As we are still in the process of learning about the kinds of educational experiences that COTS offer learners, we recognize that there are limitations to this study. This remains exploratory, interpretive work at this point, and with a limited sample. We hope, next, to examine students' specific responses to COTS games that may be seen by some to be more "educational" without being truly educational games by nature (e.g., Minecraft). As we observe this gaming experience for learners, and ask them to "think aloud" as well as reflect on their game playing, we anticipate learning much more through richer data about how these experiences can be mapped onto the CCSS. Despite these limitations, the work stands as an important contribution to the understandings of boys' ways of gaming, their learning within gaming, and their ability to use that learning within their own educational experiences. We hope that this may help teachers to more readily accept COTS gaming in their classrooms as a way to embrace boy culture.

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