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Multiliteracies meaning-making: How four boys' video gaming experiences influence their cultural knowledge—Two ethnographic cases

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Abstract

Scholars have acknowledged the potential contribution of video gaming to complex forms of learning, identifying links between gaming and engagement, experiential learning spaces, problem-solving, strategies, transliteracy reflectivity, critical literacy, and metacognitive thinking. Despite this movement toward the inclusion of video gaming in literacy teaching, concerns about certain risks raised by scholars have slowed the adoption of using video games to foster learning.

Using a multiliteracies lens, this multi-case study examined the experiences of four boys engaged with video gaming in two different contexts: a community centre and an after-school video club. By drawing on Feminist Post-Structural Theory, Vygotskian, and video gaming technology, I have gained an understanding of the nature of boys' behavior and learning in social settings while they engage in video game play. Studying the ways in which boys make meanings through multimodal ways of learning can offer insights into strategies that can potentially reinvent traditional literacy pedagogical boundaries and establish new ways and practices for building knowledge.

These ethnographic cases, along with their naturalistic aspects, strengthened the authenticity of the social-contextual-cultural experiences of the four, adolescent-aged boys and allowed an understanding of their everyday experiences. Interpretations of the cultural meanings made by each of the boys, based on their individual unique experiences engaging with video games, can provide readers with insights into how to approach adolescent aged boys' literacy development. This study describes how these four boys developed their multimodal ways of learning by engaging with visual perspectives of video games. My methodological approach documented what boys are saying, as much as possible, which is currently understudied in the literature surrounding boys and their video gaming practices. There were a number of findings emanating from this study, including the following: (i) boys use their video gaming practices for meaning-making and collaborative efforts in order to gain an understanding of several knowledge processes (such as decision-making, predicting, analyzing, strategizing, etc.), (ii) boys extend and apply their cultural knowledge as creative innovators, producing and publishing YouTube instructional videos for video game players and designing video

games for a history project, (iii) boys demonstrate peer mentoring through storytelling, face-to-face interactions or in their online community of practice, (iv) boys make meanings using metacognitive literacy skills in a variety of ways, and (v) boys focus on cultural preservation and narrative storytelling. While acknowledging concerns related to video gaming, such as negative identity construction, violence, distraction, and time commitment for integration, this study seeks to contribute to the scholarly discussion about the use of video games in classrooms by explicitly considering the ways in which gaming may support boys' meaning-making and cultural knowledge.

Keywords

Available designs, boys, community of practice, cultural meaning-making systems, literacy, multiliteracies, multimodal meanings, video gaming

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Dedication

I dedicate this thesis to my late brother, David Lane, who always encouraged me. I also dedicate this thesis to my mom. Her love, patience, courage, wisdom, support, and encouragement for me was extraordinary and without her help, I would not have been able to achieve my goals. In addition, I dedicate this thesis to my dad and my sister for their support and encouragement.

Chapter 1

1. Introduction

Video games can alter children's brains – Nick Collins, The Telegraph, Oct, 2011

Video Games May Hinder Learning for Boys – Rachael Rettner, Live Science, March, 2010

Video games can hamper reading and writing skills in young boys by displacing other activities – Ed Yong, Discover, Feb. 2010

The adoption of video games as an alternative classroom multiliteracies resource is acknowledged in technology and multiliteracies discourses as a strategy for meaning-making and developing cultural knowledge (Cope & Kalantzis, 2009; The New London Group, 2000). Moreover, the integration of out-of-school video gaming practices as a learning process (Cope & Kalantzis, 2009) presents differences and challenges for what literacy and multiliteracies mean to educators and learners, considering the perspective of traditional literacy pedagogies in schools. The mindset of using traditional literacy pedagogies may be starting to shift, especially with increased awareness of how technology and digital practices may positively impact boys' literacy development. For example, in Ontario, Canada, the Ontario Ministry of Education (OME) has developed literacy guides for educators that included strategies to incorporate video games and new technologies in the classroom (see for example, *Literacy for a Connected World*, 2015; *Paying Attention to Literacy*, 2013; *Using Digital Technologies to Support Word Study Instruction*, 2014; *Video Games in the Classroom*, 2010). Specifically, OME's aim was to harness boys' interest in digital literacy (Brochu, Deussing, Houme, & Chuy, 2013; Ontario Ministry of Education, 2004).

Research is beginning to emerge documenting how video games, a multimodal form, can represent an alternative pathway to learning, both inside and outside of school. Scholars have identified links between gaming and factors that affect the depth of learning:

engagement, experiential learning spaces, problem-solving, strategic transliteracy reflectivity, critical literacy, and metacognitive thinking (see for example, Alexander, 2009; Apperley & Beavis, 2011; Cope & Kalantzis, 2009; Sanford & Madill, 2007; Squire, 2013; The New London Group, 1996, 2000; Van Sledright, 2002). These scholars explained the complex forms of interactive visuals—intertextual and multimodal—that are part of video games, and key to inviting players to understand a variety of texts in a variety of circumstances. They also found that these multimodal aspects help to create a rich environment that invites gamers to interact with a variety of significant learning and literacy experiences. Despite this movement toward the inclusion of video gaming in literacy teaching, scholars have raised parallel concerns (see for example, Ajayi, 2010; Alexander, 2009; Apperley & Beavis, 2011; Cumming-Potvin, 2007; Huijser, 2006; Sanford & Madill, 2007; Skerrett, 2011; The New London Group, 1996; Williams, 2007). These concerns (largely associated with negative identity construction, violent content, distraction, and time commitment for integration), have slowed the adoption of video games for their potential contribution as spaces/media that encourage complex forms of learning (Gee, 2003, 2007; Squire, 2006; Steinkuehler, 2007, 2011).

While acknowledging the concerns, this study will contribute to the scholarly discussion regarding video game use in classrooms by explicitly considering the ways in which gaming may support boys' meaning-making and cultural knowledge. Using a multiliteracies framework (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012; The New London Group, 1996, 2000), I examine the experiences of four boys' engagement with video gaming in two different contexts: a community centre and an after-school video club. In this multi-case study, I draw on specific aspects of Feminist Post-Structural Theory (Weedon, 1987) to understand how individuals, interacting with one another in society, construct meaning and gain social knowledge. I strategically use this theory to explore the behaviors of the boys and the development of their cultural knowledge as they engaged with each other through gaming. I also draw on particular theoretical frameworks interpreted by Vygotsky (1978), and video gaming technology (Apperley & Beavis, 2013; Gee, 2007, 2009; Squire, 2013; Steinkuehler, Squire & Barab, 2012) to help understand the nature of boys' behavior and learning while they engaged in video game play.

Therefore, through a multiliteracies lens, I use the multimodal framework put forth by Cope and Kalantzis (2009), and The New London Group (1996), to help me to understand the ways in which the four boys in my study explored, developed, and shared their cultural knowledge through their out-of-school video gaming experiences. Given that my research examines the ways that the boys' out of school video gaming practices contributed to increasing their multiliteracies skills (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012; Kalantzis, Cope, Chan & Dalley-Trim, 2016) and shaping their cultural knowledge, these lenses and domains of research help shape my understanding for addressing my research problem. In this study, I also aim to reassess some of the existing concerns about how video gaming in the classroom may negatively influence boys' behaviors and literacy practices (Ajayi, 2011; Alexander, 2009; Apperley & Beavis, 2011; Gros, 2007; Sanford & Madill, 2006). Even though children collaborate and socially interact with each other, they remain as individuals with different personalities and behavioral traits.

1.1 Research problem and questions

Institutions necessarily produce policies, guidelines, and regulations aimed at governing particular curricula and educational practices. Given the instrumental nature of these documents, they are also powerful contributors to shaping educational discourse, which in turn, plays a role in shaping practice. In Ontario, the OME creates standardized curriculum guidelines, support documents, and reporting structures for courses and for schools that allows the Ministry to monitor achievement. Literacy knowledge is the only subject area associated with an achievement test that can prevent a student from graduating with an Ontario Secondary School Diploma. The importance that the OME has placed on the Ontario Secondary School Literacy Test (OSSLT) has led to numerous initiatives focused on improving boys' achievement in literacy. The OME (2009) has long held that boys are strong visual-spatial learners but has also found that their performance in digital reading has improved their reading proficiency in international and national standardized test results (Brochu, Deussing, Houme, & Chuy, 2013). Digitized reading helps to shift traditional forms of reading and presents a new layer, shaping texts with semiotic features, which may relate to visual moving images and visual design representations of multiliteracies (Cope & Kalantzis, 2009; The New London Group,

1996). Therefore, within the context of a national agenda seeking to develop 21st century learners (C21 Canada, 2017), there remains a need to study the ways in which boys make meaning by engaging with some element of visual design. Boys' multimodal ways of learning can offer insights for reinventing traditional literacy pedagogical boundaries, and establish new ways and practices for building knowledge. Moreover, The New London Group (1996, 2000) explains multiple ways of gaining knowledge when they argue, "in a profound sense, all meaning-making is multimodal. All written text is also visually designed" (p. 81, 1996).

In my research, I consider not only the texts themselves, but also the social interactions between the players (the boys in the study) and the material interactions (with the games and the characters) (Fenwick & Edwards, 2013) within particular contexts and settings. Steinkuehler, Squire and Barab (2012) suggested how learning evolves from the interaction between the game play and the social practice that occurs in and around that gameplay. They further explored the social function of video gaming practices by suggesting a broader framework exists surrounding video games, such as forums, informal gaming networks, and cultural notions of video game play, which all help to facilitate individual and collaborative game play and thus learning. While the boys contribute individual personalities and behavioral traits to an interaction, collaboration can also help to facilitate individual meaning-making and thus learning. With this in mind, the following overarching question and subset of questions were the foci for this research:

In what ways do multiliteracies (The New London Group, 2000), as practiced by boys through computerized video game technologies and associated networks, influence their cultural knowledge?

A subset of this overarching question considers,

- a. What types of video games do boys prefer to use outside of school?
- b. Do, and how do, video game usage and surrounding networks act as contributing factors to boys' cultural knowledge and use of literacy skills?
- c. Do, and how do, social dynamics contribute to boys' multiliteracies skills and cultural experiences?

1.2 Background to the problem

To better illustrate the context of my research, I want to return to my initial awareness about institutional knowledge potentially influencing discourse surrounding boys' underachievement in literacy. Upfront, it is important to identify the consistent historical and present focus by the OME on administration of regulated tests to assess literacy achievement in schools. Furthermore, an ongoing concern for the OME has been addressing boys' underachievement in literacy along with their regular promotion of literacy programs. As part of this ongoing concern, the OME has made various resources available to teachers: an excess of twenty specific boys' literacy publications, teacher inquiry sites, digital videos, and work plan support booklets for teachers' practical use (Ontario Ministry of Education, 2004, 2009a, 2009b). While several scholars have critiqued the gendered concerns related to achievement (Frank, Kehler, Lovell & Davison, 2003; Greig, 2003; Kehler, 2007, 2011; Lingard, Martino & Mills, 2009; Lingard, Martino, Mills & Bahr, 2002; Martino, 2013), often dismissing policy guides as part of the boy-friendly strategies, OME continues their initiatives to focus on raising boys' achievement in literacy. Therefore, I am focusing my research on boys, but within that focus, I am examining them as unique learners operating within their social environment. For my study, I strategically adopted Feminist-Post Structural Theory (Weedon, 1987) as a way to interpret how individuals interact with each other in society, construct meaning, and gain knowledge about social practices that exist in society. I chose post-structural feminism as a lens to inform my research and Weedon (1997) as the guiding feminist. Although her perspective includes both boys and girls, a shortfall exists to apply to my work with her continuous return to female rights' advocacy, arguing, "political questions should be the motivating force behind feminist theory which must always be answerable to the needs of women in our struggle to transform patriarchy" (p. 2). Weedon (1987) argues that post-structural feminism rests in the interpretation of language, which is subjective, and contributes to individual meanings. Weedon (1987) conceptually viewed post-structural feminism as social meanings, power, and individual consciousness. She argued that meanings reflect language based on the way individuals, who think in different ways, describe the context of their experience by using words, symbols or language to develop their argument or discourse. Weedon's central ideas

about post-structural feminism can be seen as somewhat exclusive, especially how it applies to my study, because she constructed the majority of her arguments in consideration of females and the dominance of patriarchal societal assumptions. Some scholars, such as Lingard and Douglas (1999), questioned post-structural feminism's inclusive concepts. According to Lingard and Douglas, feminists are concerned with "creating a space within which women and femininity can have their own voice" (p. 24). They also contended that straightforward adoption of current post-structural feminist theories is problematic because of this need for more equal gender relations, policies, and practices in education for both boys and girls. Despite these limitations in Weedon's theory (1987), she did highlight a main goal of finding a way for all individuals to achieve self-expression through language and voice. Therefore, I strategically focus on Weedon's theory (1987) about language and voice and how this relates to boys' socially constructed discourse, which become clearer through the meanings attached to peoples' experiences (Weedon, 1987). Using a post-structural feminist lens is important to my own research and epistemology of social constructivism and subjectivism. Weedon's (1997) direction incorporated the voice of both women and men but also explained her understanding of power dynamics that exist between the genders and need to be addressed to balance that power. More importantly, Weedon's focus on voice and individual subjectivity serve as a backdrop for my epistemological framework of constructivism. Through a post-structural feminist lens, I want to focus on boys who have been understudied. Finding boys' voices includes a process of meaning deconstruction to explore existing contextual relationships that I identify within my ethnographic research.

I also draw on the social constructivist work of Lev Vygotsky (1978). Vygotsky connected how children think independently and learn socially or collaboratively. He reasoned that when children socialize, they rely on cognitive functions such as language and speech as a tool to problem-solve (Vygotsky, 1978). He also argued that children use signs and words as the most important means of social contact with other people, and that children tend to activate these advanced levels of cognitive functions to communicate with others. When children exchange words and language with their peers, they are collaborating and socially interacting with each other, which, Vygotsky argued,

contributes to the ways they actively learn, and gain knowledge from each other. Further to the point of children collaborating and socially interacting with each other, video games can also be a source for collaboration and learning, particularly for boys, based on the ways they socialize and communicate with peers through language, to gain knowledge through their cultural experiences (Gee, 2007). At the same time, social collaboration also involves the zone of proximal development, which Vygotsky (1978) described as children developing learning skills based on imitation or following a demonstration. He explained that the zone of proximal development is the distance between the actual development level, as determined by independent problem-solving, and the level of potential development as determined through problem-solving in collaboration with more capable peers.

The research questions for this study aim to explore boys' cultural knowledge development. In keeping with my post-structural feminist perspective, whereby meanings are attached to peoples' experiences (Weedon, 1997), I need to hear directly from some of these understudied boys. In my methodological approach, I document and learn from what the boys' are saying, as much as possible. This approach allows me to understand how they make meanings within their own social contexts rather than regulatory environments, such as schools, that can shape dominant definitions of masculinity (Connell, 1996, 2000; Keddie, 2008; Lingard & Douglas, 1999; Mac an Ghail, 1994). Through the boys' voices, I can better understand multiple perspectives (Patton, 2002) as I make sense of debates and concerns about how the boys' cultural knowledge contributes to multiliteracies meaning-making.

Therefore, the multiliteracies theory by Cope and Kalantzis, (2009), Kalantzis and Cope, (2012), and The New London Group, (1996), was extremely useful to my research study because the OME (2009) provided recommendations, based on research OME conducted that video gaming has the potential to excite a passion in boys. According to Kalantzis and Cope (2012), processes of meaning-making are frequently multimodal, features found in many video games, combining different modes of representation or sense-making, such as written, visual, spatial, and audio. This cycle of meaning-making is a dynamic and fluid design process culminating in making meaning. During this design process, one interprets and uses those meanings in interactions and communications with

others (Kalantzis & Cope, 2012). Furthermore, suggestions about video gaming exciting a passion in boys, specifically by Brochu, Deussing, Houme, and Chuy (2013), although central to my research problem, did not explore the ways in which boys engage in video game practices to take advantage of multiliteracies (Apperley & Beavis, 2013; Gee, 2007; Steinkuehler, 2011). Additionally, I argue that boys' video gaming practices can potentially help them to develop and share cultural knowledge, and simultaneously address their underachievement in literacy.

1.3 Positioning the researcher

This thesis resulted from my work as an elementary and high school teacher in a Greater Toronto Area (GTA) school board. Prior to becoming a teacher, I was fortunate to have my own tutoring company and to work with another teacher as a consultant/partner in a second tutoring company for over half a decade. I frequently taught a majority of boys and observed their struggles with literacy. Listening to their stories. I resolved to work toward improving boys' success in school, or at least to develop an understanding of the ways they learn so I could develop better pedagogical tools to support them. I had read how boys might learn differently and I wanted to gain firsthand knowledge of this learning process. I always found opposing views of boys and their literacy practices. On the one hand, I found that some boys streamed into applied English, dropped out or just failed. On the other hand, I also encountered evidence that some teachers were reluctant to embrace technology in the classroom, perhaps due to lack of knowledge, potential cyberbullying issues, or limited time and scope of class curriculum (Baek, 2008; Hommel, 2010; Kirriemuir & McFarlane, 2003; Rice, 2007; Sanford & Madill, 2007). Nevertheless, it was troubling for me to see teachers' reluctance to embrace technology in the classroom, because I believe there are misconceptions about integrating video gaming as a pedagogy.

As a teacher, I do have concerns about boys playing video games over an extended period (at home and using them in the classroom), and I certainly want to provide a safe, inclusive classroom. As an elementary and high school teacher of English, I want to consider how boys connect with these video games and explore the potential of transferring gaming practices to literacy skills in school. I struggle with some of the

debates surrounding this particular research. Debates include whether or not video games have a negative influence on boys and whether or not boys rely on their neurological or visual spatial abilities for learning outcomes (Gurian & Stevens, 2010a, 2010b; Ontario Ministry of Education, 2004, 2009). In my study, I was concerned about the adolescent boys preferences for video games, which could contain themes of violence and misogyny, and whether their interactions with these video games could result in negative identity constructions. Therefore, during my observation sessions with the boys, I continuously monitored for signs of those risks, which may result in outweighing benefits of multiliteracies meaning-making. As a post-structural feminist, I recognized the need to disrupt any potential social production of negative behaviors. In Chapters 4 and 5, it becomes clear, that the boys create defense mechanisms, that may contribute to their changes in behaviour, when they encounter toxic masculine traits from other peers, specifically related to perceived instances of bullying. I rationalize that perhaps research is not moving forward in this field because video gaming just represents an excuse to have fun, relax and socialize in class instead of concentrating on class work. I do find that a gap exists in the current field of research regarding whether boys' out-of-school video gaming practices affect in-school literacy practices (Akkerman et al., 2009; Apperley & Beavis, 2011; Gros, 2007; Hommel, 2010; Huizenga, Admiraal, Akkerman, & Dam, 2009; Ke, 2008; Kristie, 2008; Newkirk, 2002; Sanford & Madill, 2007). Some of the unique experiences of the four adolescent-aged boys from my study may provide a richer understanding of video gaming and multiliteracies practices. Moving beyond these two debates, first if video games have a negative influence on boys' behaviors and second if they rely on visual spatial abilities for learning outcomes, I aim to bridge this gap, and to understand how boys' video gaming experiences influence how they develop, adopt and share cultural meanings of practice.

1.4 Structure of dissertation

In order to explore and present my research problem, I have organized this dissertation into six chapters. The purpose of this chapter is to introduce the problem and questions related to this study. In this chapter, I provide the context for my research problem that focused on boys' interaction with video gaming using a multiliteracies lens to support boys' cultural meaning-making (Cope & Kalantzis, 2009; The New London Group,

1996), and how this may also serve in ways to improve their underachievement in literacy. I also outline the essential domains of research framing my study; following that, I briefly describe why I choose specific theoretical frameworks as lenses to my study.

As part of the context of my study, I described the OME's discourse and how it has shaped their knowledge and policy publications about boys. Although I highlight my concerns in Chapter 2 about categorizing boys within National and International standardized literacy test scores, and although these are narrowly focused categorizations, passing the Ontario Secondary School Literacy Test (OSSLT) remains a requirement in this province to achieve an Ontario grade 12 diploma. Therefore, as a background point, I focus on some existing literacy tests results, which are often relied upon by educators and government policy makers, to highlight boys' underachievement in school (Lingard, Martino & Mills, 2009; Martino & Rezai-Rashti, 2013; Ringrose, 2007; Smith & Wilhelm, 2009; Weaver-Hightower, 2003).

Based on these literacy results, I chose Grade 10 students as the focus for my research. Considering all of these perspectives, I explain why I choose video games to demonstrate how boys may rely on multimodal ways of learning, such as social dynamics, and visual design (Cope & Kalantzis, 2009; The New London Group, 1996). I also illustrate how boys build their cultural knowledge, using digital sources (Brochu et al., 2013), which may help to improve their literacy underachievement. Finally, I situate myself as a researcher in a reflexive (Patton, 2002) manner by considering my own voice, personal assumptions and teaching experiences while I observe the boys in their different video game play settings. As part of that reflexive voice, I openly acknowledge growing disagreement among scholars who often label the OME strategies as boy-friendly and that these strategies may not have sufficient empirical-based evidence to support such strategies (Lingard, Martino & Mills, 2009; Martino, 2013; Martino & Berrill, 2003; Martino & Rezai-Rashti, 2013; Maynard, 2002; Skelton & Francis, 2011).

In Chapter 2, I review and briefly examined the history of the project, based on the existing field of scholarly research. From this perspective, I explain how the research questions emerge for this study and argue that boys' learning and cultural knowledge, and behaviors should not be considered homogeneous or based exclusively on neurological

claims about visual-spatial learning specific to some boys. For example, some government-driven texts described boys' learning using a neurological emphasis based on descriptions that they are strong visual-spatial learners in comparison with girls (Brochu, Gluszynski & Knighton, 2010; OECD, 2010, 2013; Ontario Ministry of Education, 2004, 2007, 2009). This neurological identification of boys' ability implies a biological difference between boys and girls (Connell, 1987; Eliot, 2009; Titus, 2004). In some ways, this learning difference between boys and girls provides another way of looking at how boys learn and think in comparison with girls. These differences of how boys and girls learn do not consider the ways in which some boys construct their cultural knowledge and, more importantly, how boys might react and respond to video game content when they engage in video gaming practices (Alexander, 2009; Connell, 1996; Sanford & Madill, 2007). In addition, I explain my theoretical framework supporting the data and research questions for these ethnographic cases. I also describe the history and examine the multiliteracies model, framework and pedagogy as a lens to my research (Cope & Kalantzis, 2009; The New London Group, 1996). Moreover, I outline the pedagogical framework currently existing in Ontario schools resulting from government driven policies, such as those promoted and developed by OME.

In Chapter 3, I provide an overview of the research paradigms and identify the steps involved in conducting this research. One of the goals of my study is to elevate student voices. Therefore, in Chapter 4, I present my findings relating to multiliteracies meaning-making (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012; Kalantzis, Cope, 2012, Chan & Dalley-Trim, 2016; The New London Group, 1996) based on the four boys' contextual experiences in a community centre setting and an after-school video club setting, both situated in Ontario. I attempt to hear, as clearly as possible, from the boys, through their stories, actions, and reactions surrounding their video game play.

In Chapter 5, I provide a critical interpretation and componential analysis of the boys' voices, gaming and literacy practices, by examining the views, similarities, differences and anomalies of the participants' experiences, including how their transformed meanings position into the Learning by Design framework (Cope & Kalantzis, 2016). This interpretation of the boys' voices demonstrates how the boys' stories substantiate my theoretical framework. I review what the data means for advancing multiliteracies

approaches and multimodal ways of learning in school for boys by applying the Learning by Design framework connected to the Ontario English curriculum (Ontario Ministry of Education, 2007). In the final chapter, I address how I make sense of this rich data by providing implications to researchers. I indicate limitations of the study and provide suggestions about future directions for modifying the study.

1.5 Why the need for this research?

Early research into the relationship of gaming and education focused on several perspectives, such as (a) a computer competency for science and technology, (b) a culture reproducing negative social attitudes due to video game content (such as themes of power, violence and misogyny), and (c) a source of complex learning tools for literacy (Ajayi, 2011; Akkerman, Admiraal, & Huizenga, 2009; Alexander, 2009; Foster, 2009; Gee, 2003, 2007, 2014; Gros, 2007; Sanford & Madill, 2006, 2007; Squire, 2013; Steinkuehler, 2010; Steinkuehler, Squire & Barab, 2012). As J. P. Gee (2007) has long argued, “good games are problem-solving spaces that create deep learning, learning that is better than what we often see today in our schools” (p. 10). Recent research tells us that gaming and literacy are not on opposite ends of the literacy learning spectrum but rather represent a highly unified multimodal foundation (Beavis, 2012; Gee, 2014; Squire, 2013; Steinkuehler, Squire & Barab, 2012). For example, Catherine Beavis (2012) advocated for research into gaming as presenting “new forms of telling stories ... For many children, some of their most satisfying and engaging experiences of narrative, and of the making and playing of stories comes through computer games” (p. 18). In my work, I see the games as cultural artifacts that view the learner as a co-producer of knowledge, and co-designer of their own social futures. As Gee (2007) reminded us, “good video games are good for your soul and when you play them with a thought, reflection, and engagement with the world around you” (p. 8). Given a multiliteracies aim to ensure that learners are equipped to participate fully in their own civic lives, an examination of the meaning-making processes from the boys themselves will contribute to the emerging literature in this field. According to Cope and Kalantzis (2009), Kalantzis and Cope (2012), and The New London Group (1996), the multimodal model expanded the concept of literacy toward multiliteracies by providing a framework of available designs to draw upon. Kalantzis and Cope (2012) recognized scholars such as

James Paul Gee who analyzes video games as new forms of literacies that help learners navigate multimodal forms of narratives. Part of Gee's analysis includes learners as producers of knowledge, learners as mentors, and learners' extensive use of multimodal designs (Kalantzis & Cope, 2012).

Like my own research, Kalantzis and Cope (2012) also echoed scholars' concerns over boys' frequent engagement with video games that are grounded in toxic masculine identities (Mac an Ghail, 1994) and the worry that boys might be drawn to games with violent content. With regards to concerns surrounding negative identity construction, there may be an opportunity to open dialogue, based on the findings emerging from my study, around increasing clarity about boys who do not have stereotypical responses to video games. Furthermore, a multiliteracies concept addresses literacy pedagogy as a design encompassing various interconnected systems, including environment and people, that become part of the broader picture of cultural experiences. The interplay of environment and various peoples' perspectives and cultural experiences underpins the socially constructed aspects of multiliteracies. What is clear, however, is that we are told by The New London Group (1996), that institutions produce discourses that represent "configurations of knowledge" (p. 75), but may not use the full extent of the multiliteracies model to develop pedagogy. What is also clear is that the multiliteracies model offers a flexibility for teachers and learners to draw upon various elements that are useful to their particular context or situation. Some challenges remain for institutions, such as schools, to adopt a multiliteracies pedagogy to support literacy strategies (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012). One of the ways to address these challenges is through a practical assessment tool, such as the Learning by Design framework (Cope & Kalantzis, 2016) linked to curricular goals.

The New London Group (1996) argued that in order for institutions to establish discourse, they need to design texts and interactions that support or complement the ways in which people draw on meaning-making systems as a function of their "social linguistic practice" (p. 75). In Chapter 2, I reviewed this multiliteracies model and found that I agree with Cope and Kalantzis' (2009), and The New London Group's (1996, 2000) idea that meaning-making involves redesigning instances of reading, seeing and listening, whereby reading and seeing can involve moving images. They also explained that

meaning-making from traditional forms of literacy needs to be supplemented today by integrating multimodal design of texts that are highly visual (Kalantzis & Cope, 2012). Multimodality incorporates different forms of expression by learners who design their knowledge processes (The New London Group, 2000).

Through this study, I seek to contribute to the evidence that for mainstream literacy practices, traditionally dominated by print-based or text-based activities, educators need to acknowledge multiliteracies as alternative pedagogy to support 21st century learners. This study examines a new component by fully integrating video game technology as part of the visual design element. If educators are considering using a multiliteracies framework in educating 21st century learners, video gaming should be one of the focal points in the model, despite negative concerns, as evidenced by recent advancement to this research (Apperley, 2010; Apperley & Beavis, 2013; Gee, 2007; Squire, 2013; Steinkuehler, 2010; The New London Group, 2000). From a 21st century learners' perspective, using ethnographic based methods, my thesis examines how boys engage with video games and ways that multiliteracies influences how they develop their cultural meaning-making.

1.6 Cultural knowledge and multiliteracies

There is an increasing need to explore and extend the scope of literacy pedagogy to support cultural and linguistic diversity of learners (Ajayi, 2011; Huijser, 2006; Rowsell & Walsh, 2011; Skerrett, 2011; The New London Group, 2000; Williams, 2009). If today's capital society values innovation and creative thinking and developing and negotiating discourses and perspectives, there is a potential to develop timely and valuable skills with a multiliteracies approach (Ganapathy, 2014; Williams, 2009). This current emphasis on innovation and creativity corresponds with the multiliteracies multimodal model's concept of design. According to The New London Group (2000), meaning-makers draw from language and other modes of representation to design and redesign their meanings based on dynamic social contexts and engaging with other meaning-makers to build knowledge processes. Cultural knowledge represents an engagement of learners with diverse perspectives, which can be recognized as a powerful

social resource in the formation of a classroom community of practice (The New London Group, 2000).

Just as curriculum shapes learners into socially responsible and civic-minded individuals, the notion of designing and redesigning processes within multiliteracies pedagogy also seeks to incorporate a design for developing socially responsible individuals for the future (Borsheim, Merritt, & Reed, 2008; Cazden et al., 1996; Cope & Kalantzis, 2000; The New London Group, 2000). It is a concept that understands literacy pedagogy as a design encompassing various metalanguages or semiotic systems of meaning, including environment and people, which become part of the broader social structure for diverse cultural experiences (Kalantzis & Cope, 2012). Multiliteracies pedagogy involves available designs such as linguistic, visual, audio, gestural, and spatial, which meaning-makers draw from to develop forms of expression, which represent their particular interests, culture, and perspectives of their everyday experiences (The New London Group, 2000). The New London Group (1996) recognized that the learning process is collaborative in nature, involving diverse learners engaged in a common practice of constructing knowledge. According to Cope and Kalantzis (2009), four pedagogical aspects—experiencing, conceptualising, analysing, and applying—are fundamental to contemporary teaching and “should happen in the teaching of language and literacy in schools” (p. 1). My ethnographic multi-case study contributes to multiliteracies research by exploring these types of everyday experiences of four boys as they engage in video game play.

1.7 Definition of terms

The following are definitions of important recurring terms found throughout my study.

Available designs (also known as metalanguages) are modes of meaning based on an individual's past and new experience of everyday life and how they apply it to their learning. These modes represent linguistic (written and oral language), visual, audio, tactile, gestural and spatial (Cope & Kalantzis, 2009; The New London Group, 1996, 2000).

Community of practice represents an online network of video gaming participants that could involve virtual gaming through massively multiplayer online games (MMOG), peer-based forums, chat-rooms, and other social media (Aarsand, 2010; Steinkuehler, 2006; Wenger, 1998).

Cultural meaning systems are actions or ideas that are made up of different cultural terms that are meaningful to people (Spradley, 1979).

Cultural knowledge includes multimodal forms of meanings and modes of learning (Cope & Kalantzis, 2009).

Cultural terms refer to how the boys made meanings about experiencing a situation with a video game or other cultural experience, and how they demonstrated the particular domain or theme (Spradley & McCurdy, 1972).

Multiliteracies represents a concept that addresses literacy pedagogy as a design encompassing various interconnected systems, including environment, and people, which become part of the broader picture of cultural experiences. It involves teachers and learners using available resources to design activities of reading, seeing, speaking, writing, and listening (Cope & Kalantzis, 2009). Whenever this term is used, it is in reference to multiliteracies as articulated by Cope and Kalantzis, (2000, 2009), Kalantzis, (2012), and The New London Group (1996, 2000).

Multiliteracies pedagogy represents a transformative design of meaning-making and knowledge processes (Cope & Kalantzis, 2009).

Non-linear storyline refers to interactive narrative-based games that allow players to change characters and plot events for different storyline outcomes (Alexander, 2009).

Operational literacy represents how adolescents read both visual and print textual instructions, and use and adapt semiotic systems to meet their needs (Sanford & Madill, 2007).

Synaesthesia represents a pedagogy whereby learners shift from one available mode of meaning to another based on their comfort level of learning to make meaning (The New London Group, 2000).

Taxonomy represents an organizational, analytical tool as a way of categorizing video game preferences, cultural terms and themes (Spradley & McCurdy, 1972).

Chapter 2

2 Literature review

2.1 Chapter overview

My literature review is framed by three areas of research, specifically social dynamics (collaborative learning), multimodal forms of meaning-making, and cultural knowledge. These domains of research connect to the ways and modes of meaning explored by the boys when they engage with video games to enhance their cultural knowledge. Cultural knowledge relates to multimodal forms of meanings and modes of learning. Multiliteracies' concepts bring light to various meanings made by the boys during video gaming.

Each of these domains were relevant to my research problem, which examines how adolescent boys' video gaming experiences influence cultural knowledge development. I conduct my research by summarizing relevant and evidence-based literature, within these domains, but I also critically challenge these to reveal gaps in literature, and to provide a framework for my questions and arguments, as they relate to my research problem. I organize this literature review under the following main headings: *Literature shortcomings, Video game complexities, Gender debates, Video games and learning opportunities, Transitioning literacy practices, Multiliteracies and video gaming trends, Government-led strategies, and Summary and future paths*. These are framed by concerns existing in some of the broader discourses, which I considered and discussed in Chapter 1. In particular, I am interested in understanding how boys' out-of-school video gaming practices have the potential for any multiliteracies opportunities existing in video games that could be transferred to pedagogical practices, and the complexity of cognitive development in boys as they engage with different video game themes and content to cultivate their cultural knowledge (see definition of terms in section 1.7).

As I illuminate in this chapter, some discourses have revealed an important gap in the literature: the connection between how boys respond to multiliteracies in video games, independently and socially, and how boys construct their cultural knowledge when they play these games. During my review of the existing field of literature, what became clear

to me was that complexities exist surrounding video gaming. Based on these complexities, I want to understand how or if boys perceived video gaming as a significant way to learn, providing me with a basis for my dialogue and exploration into how boys' video gaming represents an opportunity for meaning-making. I also hope to address boys' underachievement in literacy. During my review of the literature, I encountered some studies that explored the intertextual, multimodal, and literacy properties of video games that provide engagement, collaboration, and motivation for players (Ajayi, 2011; Alexander, 2009; Apperley & Beavis, 2011; Gros, 2007; Huizenga, Admiraal, Akkerman, & Dam, 2009; Sanford & Madill, 2006, 2007).

Additional studies have added to the complexity of video games as a pedagogical resource. These discourses argue that video gaming is not a good teaching tool because of issues with time commitment for both student and teacher, and common themes of competition, violence and misogyny (Ajayi, 2011; Akkerman, Admiraal, & Huizenga, 2009; Alexander, 2009; Foster, 2009; Gros, 2007; Sanford & Madill, 2006, 2007; Steinkuehler, 2010). Despite these arguments, literature continues to be written about how video gaming practices can lead to various multiliteracies skills such as reading for meaning, applying knowledge, analysis, problem-solving, and strategy (DeCoito & Richardson, 2016; Gee, 2007; Squire, 2013; Squire, DeVane & Durga, 2008; Squire & Jenkins, 2011; Steinkuehler, 2010; Steinkuehler, Squire & Barab, 2012).

Based on the aforementioned perspective that video gaming practices can lead to various multiliteracies skills, it is timely for me to explore video gaming practices contributing to ways that boys build multiliteracies skills and cultural knowledge. I begin my exploration with the visual design aspect of the multimodal model (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012; The New London Group, 1996). Based on this, I referred back to the OME notes about boys' literacy underachievement by Brochu et al. (2013). They suggest that "it might be possible to harness boys' performance in digital reading to improve their reading proficiency in both print and digital formats" (p. 43). Furthermore, I rely on the OME's (2009) interpretation that boys are strong spatial learners. I find OME's (2009) suggestion interesting because some recent research has surfaced which may provide another way of looking at the ways boys learn. This research suggests that some boys, at puberty, rely more on the visual part of the brain's right hemisphere (Blum,

1997; Gurian & Stevens, 2010a, 2010 b; Sax, 2005) than girls do, and therefore depend more on moving pictures and symbols for learning. This idea helps to shape my own research into whether video games help some boys to understand concepts through symbols associated with moving images (Apperley, 2010; Apperley & Beavis, 2013; Compton-Lilly, 2007; Gee, 2007; Sanford & Madill, 2007; Squire, 2013; Steinkuehler, 2010; The New London Group, 2000). Furthermore, moving images was one of the visual designs in the multiliteracies multimodal model (Cope & Kalantzis, 2009). Visual designs may contribute to another way of understanding meaning-making and the way some boys approach their learning. These perspectives and interpretations are assumed merely as a starting point to my research problem. Based on multiliteracies and cultural knowledge (see definition of terms in section 1.7) perspectives, to date, some of the research domains have focused on different strategies to address literacy underachievement, but also include out-of-school video gaming multiliteracies practices (Steinkuehler, Squire, & Barab, 2012). Steinkuehler, Squire, and Barab made the point that games have paralinguistic qualities in that they convey meaning through elements of “gesture, space, colour, sound, and activity, and agency” (p. 104). Therefore, in this chapter, I first present a history of the literature, including the arguments of various scholars who are positioned in various dialogues within the boys’ discourse spectrum, including the gender gap and how boys learn. Following this, I provide an insight into discourse surrounding digital literacy practices, meaning-making processes, and video gaming practices that fit into the multiliteracies framework (Cope & Kalantzis, 2009).

2.2 Theoretical framework

2.2.1 Cultural meaning-making systems.

With respect to literacy pedagogy, educators tend to think about curricular goals, and about delivering curriculum in a traditional print-based or written form. The idea of standardized testing, demonstration of prescribed set of competencies taught in teacher-led environments, is no longer adequate (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012; Kalantzis, Cope, Chan & Dalley-Trim, 2016). Multiliteracies provides a different approach to basic reading and writing, one that represents a highly creative and active process to support cultural meaning-making systems (Ajayi, 2011; Ganapathy, 2014;

Huijser, 2006; Leander, 2013; Skerrett, 2011; Williams, 2009). The outcome of transforming meaning is in the redesigning process that recognizes how individuals make meanings as active designers of change, creativity, and innovation. The redesigned meaning is a new, innovative, creative meaning, and represents an expression of the meaning maker's voice. The new meaning draws upon available meaning-making resources relating to their context and culture. Therefore, analysis of meaning-making interactions involves the concept of designing. Thus, these new ways of knowing focus on the learners as agents in the way "we interact in our everyday lives, the ways in which we make and participate in meanings" (Kalantzis & Cope, 2012, p. 13). Several scholars also view knowledge as having an important role in society, and as a result of learning through educational processes (Borsheim, Merritt, & Reed, 2008; Cazden, Cope, Fairclough, Gee, & et al., 1996; Cope & Kalantzis, 2000, 2009; Ganapathy, 2014; Huijser, 2006; Leander, 2013; Skerrett, 2011; The New London Group, 2000; Williams, 2009). Cope and Kalantzis (2009) characterize meaning-making as being an everyday experience in society. Based on these everyday experiences of meaning makers, Cope and Kalantzis (2009) developed the multiliteracies framework representing a meaning-making system involving experiencing, conceptualizing, analyzing, and promoting a culture of flexibility, creativity, innovation, and initiative (as outlined in Section 2.24).

According to Cope and Kalantzis (2009), a goal of multiliteracies pedagogy is to create a shift of literacy pedagogy from considering learners as consumers of knowledge to considering them as active, cognitive, and reflective contributors to the cultural knowledge of their society. The original multiliteracies framework, conceived in 1996 by The New London Group, focused on metalanguages as the meaning-making system and connection to specific curricular goals. Cope and Kalantzis (2009) reconfigured that framework in 2009 to have less focus on "teachable specificities of meaning-making systems" (p. 9) and shifted toward a recognition of connotative meaning or suggestive significance for learners in their discovery process (Spradley, 1979). In other words, learners make meaning by contextually and culturally situating it in their everyday experience and in the world around them.

As part of the learning process, individuals make meaning by using metalanguages or available designs in their activities to transform meaning into new designs or the

redesigned (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012; The New London Group, 1996). Designing is the process of shaping meaning which emerges from the everyday experiences of the meaning maker. Every moment of meaning-making for the learner involves some type of transformation of the available designs. Linguistic, visual, gestural, audio, and spatial elements are all part of designs. Reading, seeing, listening, doing, are all examples of designing (The New London Group, 2000). Therefore, as learners transform their meaning-making interactions, they actively and creatively acquire cultural knowledge, adopted and shared by others in their communities of practice. In the process of designing, learners transform their knowledge by creating new constructions and varying representations of reality, transforming relations with each other and themselves (Cope & Kalantzis, 2009). By referring to the social construction of knowledge (the redesigned) as a transformational activity, The New London Group's (2000) multiliteracies theory is extremely useful to my research because it also helps to position both my constructivist view of how humans make meaning by the ways they interact between their activities, experiences, and ideas, and my use of Vygotskian (1978) theory of collaboration for interpreting the boys' experiences.

This notion of shared patterns of meaning-making establishes a basis for cultural knowledge as more encompassing than earlier positions suggested by The New London Group (1996). Cope and Kalantzis (2009) recognizing the actively and creatively transformed knowledge as rhizomatic or generative in nature, echoes Vygotskian's (1978) process of cognitive social interactions, which are the foundation of meaning-making. Recall that Vygotsky (1978) argued learners could contribute to the ways they actively learn, and gain knowledge from each other. Cope and Kalantzis (2009), Kalantzis and Cope (2012), and The New London Group (2000) took collaborative knowledge and meaning-making one-step further by grounding meaning-making systems in contextual and cultural experiences. Later in this chapter, I discuss my choice of ethnographic data analysis which I based on Cope and Kalantzis (2009), and The New London Group's (1996) suggestions regarding the form of modalities of meaning for ways to express that knowledge (see section 3.4). Modalities of meaning is important to my research, because I seek to understand how boys perceive cultural meaning-making, within their particular contexts, individually, collectively, and collaboratively.

2.2.2 What are multiliteracies?

One of the leading pedagogical frameworks for teaching literacy put forth by Cope and Kalantzis, (2009), Kalantzis and Cope, (2012), and The New London Group (1996) was multiliteracies. This concept involves a combination of available design elements. These design elements represent various learning processes which are referred to as modes of meaning. Cope and Kalantzis, (2009), Kalantzis and Cope, (2012), and The New London Group (1996) explained that the multiliteracies framework understands that meaning-making is multimodal and all written text is visually designed. They also argued that literacy pedagogy has shifted from language- and text-based forms to having a much broader purpose, which can differ according to context, and have “specific cognitive, cultural, and social effects” (p. 64). Kalantzis and Cope (2012) also suggested that multiliteracies is dynamic and that meaning makers “are capable of seeing things from multiple perspectives ... have an expanded range of ways of meaning making ... so they can make and participate in meanings in a wide variety of social and cultural settings” (p. 7).

Within this original multiliteracies framework, in The New London Group’s (1996) view, teachers acted as facilitators to apply different available pedagogical designs, often redesigning activities in the classroom to motivate students to “achieve different sorts of learning” (p. 73). In this view, the multiliteracies concept first involves teachers using available resources to design activities of reading, seeing, speaking, writing, and listening. In their reconfiguration of the model, Cope and Kalantzis (2009) shifted the emphasis away from teachers to learners—the meaning-makers. The meaning-makers use designs or representations in their designing processes to shape, create, and innovate meanings, based on their contextual and cultural experiences. Finally, the redesigned emerges as the outcome of designing new meanings, whereby students become unique producers of new meanings and build transformed knowledge (Cope & Kalantzis, 2009; The New London Group, 1996). This transformative process of knowledge is grounded in pedagogical phases including experiencing (cognitive meanings are contextual and cultural, including in and outside of school); conceptualising (abstract thinking, concept theory building, and mental models); analysing (reasoning, relations between

cause/effect, textual connections, critical evaluation of own and others' perspectives); and applying (applying knowledge to real world situations, innovative, and creative thinking).

2.2.3 Multiliteracies meaning-making: A closer look at the multimodal model.

To understand learners' meaning-making systems as they relate to literacy, The New London Group (2000) argued the need for a flexible and dynamic theory. Learners' meaning-making theory involves a design concept whereby learners' literacy activities moves beyond traditional print resources. The New London Group (2000), and Cope and Kalantzis (2009) emphasized that literacy discourse is based on how learners build knowledge processes and meaning by relying on a range of semiotic activities (Alexander, 2009; Gee, 2007; Gros, 2007; Gumulak & Webber, 2011; Sanford & Madill, 2007). More importantly, The New London Group (1996) suggested that the design offers a flexibility of metalanguages for learners to choose from to describe and explain patterns of meaning, including "Linguistic Design, Visual Design, Audio Design, Gestural Design, Spatial Design, and Multimodal Design" (p. 78). The New London Group (1996, 2000) and Cope and Kalantzis' (2009) multiliteracies theory of available pedagogical designs is particularly useful to my research because it illustrates the notion of learning processes based on how listeners and readers explore new meanings from the texts they encounter by relying on their experiences and using available designs or metalanguages as resources. Kalantzis and Cope (2012) remind us that multiliteracies focuses on "the learners' own meanings, [and] the texts that are relevant to them in their everyday lives" (p. 33).

The New London Group (1996) originally designed the multimodal framework, which includes various metalanguages (ways to design learning processes), to describe and interpret the design elements of different integrated meaning-making systems of multimedia texts. Since its inception, Cope and Kalantzis (2009) expanded the scope of the available designs within the multimodal framework meanings to integrate innovative, creative, dynamic and transformative elements relating to learners' social and cultural experiences. These redefinitions incorporate how the meaning has certain suggestive significance contextually and culturally for the learner in their designing process. For

example, the linguistic element, renamed as written language, includes print text, digital text and oral language to represent audio text. The visual representation which can include video gaming audio text and on-screen digital text was redefined by Cope and Kalantzis (2009) to include still or moving images, view, scene or perspective. Other redefinitions shifted the audio element to include music, sounds, hearing and listening. A new tactile element includes touch, smell, taste, and any associated feelings of a physical nature. The gestural representation also related to the physical body including facial expressions, movements of hands, arms, legs, dance, fashion, ceremony, and ritual, but also includes a form of feelings or emotions. Finally, the spatial representation includes proximity, spacing, layout, interpersonal distance, territoriality, architecture and landscape. The New London Group (1996) also emphasized the multimodal element as an asset for one to design and redesign meanings. Moreover, within this multimodal element, two key concepts exist in the form of intertextuality and hybridity, which are still relevant in their reconfigured model. Hybridity refers to people innovating and articulating established practices and conventions in new ways by using different modes of meaning (The New London Group, 1996, 2000). Intertextuality refers to how the designer interacts in complex ways with meanings and how those meanings relate to the world around them (Cope & Kalantzis, 2009). Given that The New London Group (1996) and Cope and Kalantzis (2009) emphasize the meaning maker creating and redesigning new ways of established practices within different modes of meaning, this outcome of transformation is the learning process, which transforms the meaning maker themselves. In addition to the multiliteracies framework, The New London Group (1996) offered insight for developing a multiliteracies pedagogy, which is extremely useful to my research because it connects back to my main theoretical positioning of collaborative inquiry (Vygotsky, 1978). Furthermore, the transformative elements of designing are echoed in the revised pedagogy (Cope & Kalantzis, 2009), in which the authors recognized the dynamic interaction between humans and design elements to achieve learning outcomes. Based on interaction, it may be possible to draw some new connections in our understanding of the cognitive abilities of learners, such as those proposed by some scholars that highlight spatial learning (such as Gurian & Stevens, 2010a, 2010b; Sax, 2005).

2.2.4 How to apply a multiliteracies pedagogy.

In order for the multiliteracies theory to be successful in the literacy domain, The New London Group (2000) emphasized the need for a pedagogy to supplement what teachers do by considering “how the human mind works in society and classrooms, as well as about the nature of teaching and learning” (p. 30). The Group also told us that humans develop knowledge socially, culturally, and contextually through collaborative interactions with others of diverse backgrounds, capabilities and views while engaged in common practices within a community of learners (Wenger, 1998). Specifically, The New London Group (1996) addressed the question of how learners engage in common practices by applying four methods of instructional strategy: situated practice, overt instruction, critical framing, and transformed practice. With instructional strategy in mind, Cope and Kalantzis (2009) reconfigured the pedagogy to include experiencing, conceptualising, analysing, and applying. This knowledge process begins with experiencing.

2.2.4.1 Experiencing.

Experiencing represents the view that learners' cognition is situated, contextual and cultural (Kalantzis & Cope, 2012). Learners immerse in meaningful practices within a community of other learners. According to Cope and Kalantzis (2009), and certainly useful to the aim of my research, learners play multiple roles based on their experiences. Cope and Kalantzis (2009) also recognize the pedagogical weaving between school learning with practical out-of-school experiences that are based on individual interests (Kalantzis & Cope, 2012). An important point that I also agree with, which needs emphasizing, is how these experiences interconnect culturally. Learners experience what they know by being reflective and by bringing their own experiences, interests, perspectives, and ways of understanding the world. Cope and Kalantzis (2009) explain how learners experience the new by being “exposed to new information, experiences and texts” (p. 18). This experiencing process (Cope & Kalantzis, 2009), resembles a form of collaboration (Vygotsky, 1978), involving learners' willingness to take risks in a new domain of action and meaning. Learners transform meaning, but also trust in the

guidance of others, such as peers and teachers (Cope & Kalantzis, 2009; The New London Group, 1996).

2.2.4.2 Conceptualising.

According to Cope and Kalantzis (2009), the purpose of this instruction is to focus the learners on significant aspects of their cultural meaning-making experiences and facilitate thinking or building knowledge within the community of learners. They drew on the cognitive learning theories put forth by Vygotsky (1978) about how learners conceptualize their meanings by building mental models and abstract theories. They also emphasized that conceptualising implies that learners are not merely recipients of information transmitted to them from instructors, but rather active learners in the process of knowledge building.

2.2.4.3 Analysing.

Analysing is the part of the process in which learners establish relations between cause and effect and explain textual patterns and connections. It also adds a dimension to the knowledge process by extending the need for learners to constructively evaluate their learning and others' perspectives. Cope and Kalantzis (2009) continued to emphasize the concept of learners creatively and reflectively innovating, but added that learners develop reasoning capacity by interrogating the interests behind a meaning, an action or their own thinking process.

2.2.4.4 Applying.

Applying involves the learners demonstrating their acquired knowledge and applying it to real world situations. It represents how learners develop innovative and creative ways to demonstrate their meaning-making and knowledge (Cope & Kalantzis, 2009). This step also emphasizes the importance of learners' diversity, interests and experiences. The authors reminded educators that learners transform their meaning-making into other contexts by reflecting upon their own goals and values as they apply and revise what they have learned. Learners use their cultural insight and experiences to continuously revise their learning.

2.2.4.5 Engaging learners with multimodality.

According to Gunther Kress (2003), examples of everyday communication involve change, such as changes in forms of text and use of language that represent potential forms of literacies (as cited in The New London Group, 2000). Kress also argues that contemporary communication landscapes continually change and that multimodality within the multiliteracies framework helps to ease these transitions. In everyday social and cultural situations, learners are designers of different semiotic actions. Learners engage in multimodal forms of texts/messages to enable them to change, adapt and modify elements used to change how they represent ideas and communicate with each other (The New London Group, 2000). Kress explained how semiotics are a sign or an expression of the meaning-makers' interest or motivated expression (as cited in The New London Group, 2000). Objects, texts or messages represent multimodal compositions for designers to communicate with their meaning-making practices (The New London Group, 2000). Kress argued that semiotic modes have different potentials, allowing possibilities of human expression and engagement with the world to facilitate cognitive development (as cited in The New London Group, 2000). When it comes to the topic of positive learning outcomes, educators will readily agree that tools and strategies that engage students' interest are beneficial. A number of recent studies conducted provide insight into how multiliteracies would encourage these outcomes. The New London Group (2000) explain how multimodality is a focal point of multiliteracies pedagogy. Multimodality provides a range of ways to increase the power of learning because learners engage in multiple forms of meaning-making. According to The New London Group (2000), multimodality integrates a range of peoples' everyday experiences from their perspectives and social cultures, supporting my social constructivist framework. By not relying on only one knowledge-gathering process, meaning-makers use their preferred mode of representation to consciously switch from one semiotic mode to another. This is called synaesthesia, which involves cognitive processing activities constantly performed by the brain (The New London Group, 2000). For example, some learners rely on visual representations to make connections and understand meanings, relying more on pictures rather than on text (The New London Group, 2000).

Ganapathy (2014) recently conducted a study examining how multimodal pedagogy could support English as second language learners (ESL) in Malaysia. The findings indicated significant demonstration of collaborative competence among peers and learners. The study is useful because it sheds some light on students and peers collaborating through a Learning by Design method (Cope & Kalantzis, 2009; The New London Group, 1996), but the study has some key issues. Namely, the geographic location of the study; the selection of participants; and the study refers to an earlier version of the Learning by Design method. The first issue is minor, but for my purposes, a North American perspective would be more helpful; however, the second issue is more problematic. Any intervention from an in-school educator, specifically a department head, as is the case in Ganapathy's (2014) study, lacks random selection and increases the risk of subjectivity. The learners selected were weak students who were to be guided by the stronger students selected as peers. The peers were guiding and editing the work of the weaker students which compounds the subjectivity from peers that learners were showing progress. Finally, the study refers to the Learning by Design method, which relates to metalanguages within the multimodal framework (Cope & Kalantzis, 2009; The New London Group, 1996), but it lacks analysis of updated multiliteracies pedagogy (experiencing, conceptualising, analysing, and applying) (Kalantzis & Cope, 2012).

2.3 Boys' underachievement in literacy has remained unchanged: Global and Canadian literacy indicators.

The Ontario Ministry of Education (2004) reported that literacy rates for boys lag behind girls. Other literacy agencies, have similar findings, including Canadian, American, and International agencies.

In a March 2012 report issued for the Ontario Education Quality and Accountability Office (EQAO, an independent agency funded by the Provincial Government of Ontario), Brochu, Deussing, Houme, and Chuy (2013) identified trends indicating that "over the past 5 years fully participating females (students who actually wrote the test) successfully achieved the literacy test on average at 87.4%, as compared to fully participating males with a successful achievement level of 80.2%" (pp.67-68). Moreover, Brochu, Gluszynski, and Knighton, (2010) reported that females outperformed males by 37 points

on the Programme for International Student Assessment (PISA) test in 2011. Statistics Canada further analyzed the trend for Canadian PISA test results and indicated that across Canada, the gender gap showed no statistical changes from 2011 to 2015 in the magnitude of the reading gap favouring females (OECD, 2010, p. 26). In addition, the 2012 PISA results, issued in December 2013, and the 2015 PISA results, issued in December 2016, both reported a similar trend of girls performing significantly better than boys in literacy skills in all OECD (Organization for Economic Co-operation and Development) countries from the year 2000 and in all Canadian provinces.

The US literacy results follow the same pattern, revealing a forty-year trend in a gender gap which has favoured females over males. Additionally, the National Assessment of Educational Progress (NAEP, 2012) disaggregated these results for 13-year-old Caucasian boys who showed no change in their achievement levels as compared to black and Hispanic male students, who improved in their literacy achievement.

My interpretation of these results indicates that boys' literacy achievement still remains a concern, however, more importantly, I am interested in Brochu et al.'s (2013) recommendation that "it might be possible to harness boys' performance in digital reading to improve their reading proficiency in both print and digital formats" (p. 43). In response to the OME's (2009) recommendation to focus on digital literacy, I explore how some of the boys relied on visual spatial skills to demonstrate learning outcomes (Ontario Ministry of Education, 2009) as they made meaning by interacting with video games. In addition, the OME's (2009) focus coincides with my aim to add a visual-spatial metalanguage, in the form of video gaming, in my reassessment of the multimodal model. For these reasons, my research is situated around the importance of considering alternate pedagogical strategies, such as video gaming.

2.3.1 Pedagogical connections to the Ontario Ministry of Education curriculum.

In both of these Ontario provincial government practical guides called *Me Read? No Way! A Practical Guide to Improving Boys' Literacy Skills* (2004) and *Me Read? And How! Ontario Teachers Report on How to Improve Boys' Literacy Skills* (2009), echo Brochu et al.'s (2013) rationale for using multimedia approaches to improve boys'

literacy skills. These guides provide strategies based on collective work of educator inquiry teams that engaged in literature reviews and implemented "strategies in the voices of the educators, parents, students, and administrators who were involved in the teacher inquiry project" (Ontario Ministry of Education, 2009).

I embark on this research in response to three major interrelated scholarly debates. First, over the years boys' video gaming practices have raised media attention and concerns for some scholars (for example, Ajayi, 2011; Apperley & Beavis, 2011; Foster, 2009). These concerns indicate that these practices may result in boys' reproducing toxic masculine social behaviours (Connell, 1996; Lingard & Douglas, 1999; Mac an Ghail, 1994), and prevent them from adopting positive gender traits, such as multiple masculinities (see for example, Connell, 1995; Mac an Ghail, 1994).

Second, there exists a shortfall in literature about a disconnection between out-of-school and in-school literacy practices. OME (2004, 2009) suggested strategies towards using digital literacy, moving images and some spatial abilities of learners (Cope & Kalantzis, 2009; Gurian & Stevens, 2010a, 2010b). In addition, scholars, (such as Gee, 2007; Hommel, 2010; Lankshear, 1997; Steinkuehler, Squire & Barab, 2012) suggested that youth can learn by using video games, but because the curriculum often lacks a pedagogical approach it has not yet occurred in schools.

Thirdly scholars asked, in which ways could boys apply and use outside video game practices to address their literacy underachievement in school without their behaviors being influenced by dominant masculinities sometimes present within peer group hierarchies? (Connell, 1996; Lingard, Martino & Mills, 2009; Mac an Ghail, 1994; Martino & Palotta-Chiarolli, 2005). Based on some of these concerns the OME (2009) recommended strategies, but lacked evidence to support these strategies. Therefore, the lack of the OME's (2009) evidence to support its recommended strategies provides the aim for my research study.

2.4 Multiliteracies and video gaming trends

2.4.1 Video games in a multiliteracies framework.

The New London Group (1996) and Cope and Kalantzis' (2009) multimodal framework and multiliteracies pedagogy as a theory has been referred to in many studies. Jordan's (2011) study offers practical insight to education based on his pedagogical framework to integrate a specific video game, called the World of Goo, into an English language classroom. The game for Jordan provided a valuable example of narratology and story making and provided multimodal ways of learning literacy. Compared to recent scholars in the video game domain who emphasize the narrative qualities of video games (for example Apperley & Beavis, 2011; Gee, 2003, 2007, 2014; Squire 2013; Steinkuehler, Squire & Barab, 2012), Jordan's study also views video games as an extension to storytelling in books. I agree up to a point with Jordan's comments that video games involve multiliteracies through close playing, close reading, and close viewing; however, the basis of his study is theoretical because it only includes his own review and explanation of the game. Jordan did not provide any research evidence to support his claims, such as interviewing or observing video game players, students or teachers.

In my ethnographic study from four boys' perspectives, I provide multiliteracies insight into their modes of meaning-making and pedagogical knowledge processes. I examine the ways these boys experience, conceptualize, analyze, and apply their learning. My study also provides a practical guide through a Learning by Design framework (Cope & Kalantzis, 2016) to assist educators in modifying and adapting the English language curriculum in a classroom. Moreover, the game, the World of Goo, was a pre-defined game, which may have met all of the available designs (The New London Group, 1996) necessary for meaning-making to occur, but without participants, it would be difficult to assess the curriculum connection.

2.4.2 Rereading multiliteracies.

Leander and Boldt (2013) also view the multiliteracies theory as somewhat prescriptive rather than creative in nature, because teachers design activities to align with curricular goals. Their understanding of multiliteracies pedagogy and the multimodal framework is

learners produce texts by designing and redesigning metalanguages within their learning processes. What is interesting is their interpretation of a participant's engagement in literacy activities. Instead of following the prescribed convention of producing a text for literacy practice, participants use texts, move with them and through them in emotional intensity, forming relations and connections. They suggested that their study offered a "rereading" (p. 26) of multiliteracies. Leander & Boldt's (2013) study was conducted over one day and involved a ten year old boy who was interested in reading Japanese graphic novels, such as Manga, outside of school, yet he struggled with in-school literacy practices. They observed his actions, such as acting out the plot by himself and with a friend, tracing his gestural (body movements), and linguistic (online forum interaction with other enthusiasts). Leander & Boldt's (2013) ethnographic study provided opportunities to reread these outside activities as literacy redesigning. I found that this study informed me on ways boys made meanings through video game play but this was limited to gestural and linguistic elements of multiliteracies, and also limited in duration.

2.4.3 Critical literacy: Intertextuality.

To revisit literacy content of video games and how they can be situated in a classroom setting, similar to the notion of intertextual skills mentioned by Van Sledright (2002), Apperley and Beavis (2011), recently conducted a three-year research study to introduce paratexts in the classroom. They emphasized that video games integrate both visuals and text in order to enhance the players' experience, and that paratexts in video games refers:

To both texts and the surrounding materials that frame their consumption, shape the readers' experience of a text and give meaning to the act of reading ... connects the familiar notion of intertextuality—the processes of reading texts as linked and "always ready" known and the need for a diversity of texts to be part of any literacy/English programme. (Apperley & Beavis, 2011, p. 133)

Paratexts can take on different forms such as game manuals and novels derived from video games. Apperley and Beavis (2011) explored the importance of how students referred to paratexts to improve performance of their gameplay. The authors, Apperley and Beavis (2011) explained that critical literacy actions related to how "sources must be

found and evaluated ...[This] requires critical understanding of game (and paratextual) design, history, genres, and ... critical understanding of the relations between structure and visual/narrative content” (p. 133). We are reminded of this power of intertextuality, as students made sense and analyzed history expressed by Van Sledright (2002), who indicated the importance of learners “drawing from prior knowledge, using comprehension-monitoring (CMS) (i.e., rereading, summarizing, questioning, predicting, or inferring), and readers must engage in an array of ... inter-textual readings” (p. 137). Well-designed video games can also provide players with opportunities to draw on their prior knowledge. According to Jenkins (2002), games designed with embedded literacy genres represent environmental storytelling, which can evoke pre-existing narrative associations and establishes a grounding for enacting narrative events. Many video games developed within the past forty years are embedded with literacy content (Gee, 2016; Kent, 2010; Squire, 2008).

2.4.4 Digital literacies practices from video games.

Henderson (2008) is surely correct in his view that traditional pen and paper tests continuously administered at schools privilege reading of print-based texts over the full range of texts and multiliteracies available in the world today. A study conducted by Henderson (2008) found that digital literacies practices among 5-14 year olds have become a common practice in Australia and also suggests expertise in literacy involves a wide repertoire which enable children to decode, make meaning, produce texts and demonstrate critical understanding across the variety of texts that they encounter. From this perspective of children decoding texts to make meaning, their experiences of reading are important regardless of the mode. Therefore, children’s engagement in reading through the Internet, discussions, games, and mobile text messaging helps to constitute new literacy conventions practiced by children in and outside of school. Although this study was theoretical in nature and encouraging the general integration of technology, not specifically video games, it helped to inform my research by studying children’s engagement in a variety of texts, including games, in their process of meaning-making.

A study conducted by Chandler-Olcott and Mahar (2003) sheds further light on how to apply the multimodal framework and multiliteracies pedagogy in school (The New

London Group, 1996). Their 18-month ethnographic study involved two girls in grades seven and eight who used digital technologies in their literacy practices outside of their formal academic settings. While working on art projects in and outside of school, they used online tutorials and communicated with other artists by email for artistic guidance outside of school. Chandler-Olcott and Mahar (2003) found that both girls attained higher levels of formal and informal levels of learning. They appeared to learn from communicating with established artists by email rather than collaborate with classroom peers, in comparison with their online tutorials. These activities are examples of overt instruction (The New London Group, 1996). They also determined that the online community of artists helped the girls to establish acceptance and friendships, which did not replace face-to-face interactions but did increase comfort in navigating online resources. Similar to earlier research surrounding students' use of multimedia technology tools (Chandler-Olcott & Mahar, 2003), this study suggests what might be possible if literacy teachers created opportunities for students to engage in multimedia composition related to students' interests in order to increase their motivation. This study informs my research by using multiliteracies as a way of creating opportunities relating to students' interests. Although the study primarily has an art focus rather than English literacy focus and relates to the elementary division, it helps to illustrate some effectiveness of alternative modes of learning.

In a 2009 study, Steinkuehler and King established an after-school program involving online gaming communities for the purpose of promoting literacy in adolescent males. The boys involved in the study, considered "at-risk" and failing in literacy-heavy classes, were highly motivated to engage in video games. The research was conducted in an experimental laboratory using a commercial video game, *World of Warcraft*. This study informed my research as it illuminated specifically boys' engagement with video gaming. Because this study investigated the impact of those games on at-risk boys' learning, it also opens pathways to a balanced approach to understanding how video gaming research could have a positive impact on boys' literacy. Researchers contacted the gamers weekly using online communities and scheduled face-to-face monthly meetings at the university campus. The online gaming community involved undergraduate volunteers and graduate assistants who collected the data and provided mentoring to the gamers. The findings

suggested that the laboratory was an initial success particularly for students using literacy as a tool for solving problems, researching, assembling online multimodal game related resources, and synthesizing in game and out-of-game information.

2.5 Literature shortcomings

2.5.1 Do Boys learn differently from girls? Is it a brain thing?

Discourses will often vary about determining how boys and girls learn differently; however, scholars often label these as essentialist arguments (Connell, 1995; Frank, Kehler, Lovell, & Davison, 2003; Gardiner, 2005; Lingard, Martino, & Mills, 2009; Martino & Berrill, 2003; Skelton & Francis, 2011; Titus, 2004). Despite these essentialist arguments, recent research is beginning to emerge about brain development, which may help to explain how boys and girls approach learning differently, for example, by using neuroscience or brain development to explain those differences.

Eliot (2009), a well-known biologist, completed an exhaustive study about brain development among boys and girls and found two significant factors. The first indicated that boys' brains are somewhat larger than girls (between 8 and 11 percent). The second revealed that, close to puberty, girls' brains finish growing about one to two years earlier than boys' (Eliot, 2009). Her point about the size of girls' brains peaking earlier than boys does suggest some overall faster program of maturation (Eliot, 2009). In other words, there are some differences between girls and boys, which might provide insight to the ways they learn. For example, Eliot (2009) suggests that subtle sex differences exist in children's sensory processing, memory and language circuits, frontal-lobe development, and overall neural speed and efficiency. Although Eliot (2009) does argue that the real differences are with plasticity, whereby the brain changes in response to its own context and experience. Additionally, Eliot (2009) cautions that these brain differences do not appear to be as significant between boys and girls in adulthood, but that these differences do exist in child and adolescent ages. Determining the relationship between brain differences and learning remains a complexity. Interestingly, Eliot (2009) does emphasize that boys mature more slowly and their "slower start is stretching into a significant handicap even into the middle-school and high school years, where they trail girls in graduation rates and academic performance" (p. 4). The perspective of boys maturing

more slowly is interesting as it may shed light on the ways boys approach meaning-making and support my choice to focus on 14-15 year old adolescent boys.

One interesting discourse was put forth about some of these brain differences by Gurian and Stevens (2010a, 2010b). They explained that the brain has a left hemisphere, used primarily for verbal skills (speaking, reading and writing), and a right hemisphere, which is associated with spatial skills, such as measuring, and perceiving direction. In commenting on boys' reliance on spatial learning, Gurian and Stevens (2010a, 2010b) also suggest that although both boys and girls like pictures, boys tend to rely more on pictures as a stimulant for learning, mainly because boys rely more on the right hemisphere. Boys' reliance on pictures was interesting to me, because my research study involved using a video gaming approach, and if boys rely on pictures for learning, then this approach may assist them in their learning. As much as Gurian and Stevens (2010a, 2010b) shed some light on boys' tendency to rely on pictures, it is important to note that for some individuals, these learning abilities can be affected by a number of other factors (for example, cognitive deficits and disruptions). The perspective of boys relying on pictures is also interesting because within the multimodal framework, Cope and Kalantzis (2009) identify moving images as one of the Visual designs for meaning-makers.

In a similar vein, some scientists have conducted brain scans and studies relating to differences between boys and girls. Schroeder and Kuriansky (2009) raised the point that boys use pictures and moving objects when they write, whereas girls tend to rely on fine sensory information, such as words. Although their studies were not specifically centred in the educational domain, this visual brain perspective for boys may help to explain their meaning-making developed from their video gaming practices as video games can be associated with moving images and pictures (Apperley, 2010; Apperley & Beavis, 2013; Gee, 2007; Squire, 2013; The New London Group, 2000). This visual brain perspective could further highlight our understanding of the way boys approach their learning.

These scholars have helped to shed light on how girls and boys approach learning in different ways. It is especially relevant to this study to know that boys' rely more heavily on spatial abilities or symbols and moving pictures (Gurian & Stevens, 2010a, 2010b; Sax, 2005; Schroeder & Kuriansky, 2009). Moreover, a number of scholars have also

recognized how boys rely on spatial abilities based on the ways they focused on symbols and moving images (Apperley, 2010; Gee, 2007; Sanford & Madill, 2007; Steinkuehler, 2010; Steinkuehler & King, 2009; The New London Group, 2000), which could support an argument in favour of using video games as an alternative approach to learning. Furthermore, due to the complexity of how some boys learn, I use the multiliteracies multimodal framework and pedagogy (Cope & Kalantzis, 2009; The New London Group, 1996) as a lens. Using this lens, I explore if there is a connection between the ways boys construct their cultural knowledge and the ways some boys rely on spatial abilities or moving images for their interaction with video games.

2.6 Video game complexities

2.6.1 Video games as a form of meaning-making.

Increasingly, scholars are recognizing how students need literacy practices in order to be prepared as future world citizens (Rowse & Walsh, 2011). Multiliteracies is one way to embrace these new forms of literacy. Rowse and Walsh (2011) explain that by making literacy plural signals, it involves multiple genres, and multiple subjectivities that shift with context, texts, and identities of people. Ajayi (2011) also suggested that a connection may exist between children's home literacy experience and their in-school literacy practices. Similar to Duncum (2004), Rowse and Walsh (2011) recognized how meaning relates to reading and writing by decoding and interacting with text, then linking background experiences to new experiences to gain knowledge. Recognizing digital practices as a form of literacy provides possibilities for learners by engaging them with an interactive nature of reading and writing, and opening up pathways for new forms of communication. As students interact with sound, images, movement, and videos, they are reading, listening, choosing, processing information and making distinctions in meaning (Rowse & Walsh, 2011). Video gaming research (Annetta, 2008, 2010; Annetta, Murray, Gull-Laird, Bohr & Park, 2006; Granic, Lobel & Engels, 2013; Rowse & Walsh, 2011; Steinkuehler, 2007) has recognized how video games offer complex literacy and learning opportunities supporting cognitive advantages, but Rowse and Walsh (2011) indicated that further investigation is warranted about how video gaming processing is affecting cognition.

According to Cope and Kalantzis (2009), knowledge processes involve experiencing through designing meanings in a number of ways. Therefore, meaning-making is dynamic, social, cultural, and contextual, which involves a combination of elements such as sound, image, movement, language, music, etc. Meaning is multimodal because it involves interaction between the written word and images, both representing forms of communication (Duncum, 2004). Being literate means the ability to use cognitive functions, such as decoding and encoding meanings. Thus, readers use cognitive functions to interpret and anchor their meanings by viewing visual images with words (Duncum, 2004). Where visual images, colours, and written words are sometimes considered separate cultural forms of communication, knowledge and learning is not just transmission based but also transactional based on highly engaging, active, dynamic, social, creative process of interpreting and translating that meaning (Ajayi, 2011; Duncum, 2004). Even though Duncum's (2004) perspective was situated in art-based education, it is informative with regards to the prevalence of multiliteracies across the curricula. Furthermore, images are complex forms of meanings, and strengthens our understanding of literacy as being dynamic, and socialized.

According to Duncum (2004), multiliteracies education is concerned with the relationship between written words and images, which is complex and needs to be recognized. Duncum (2004) further explains that images are not just a mirror to the meaning found in the text, but also offer subtle nuances of interpretation and a range of other cognitive functions, including emotional quality of an image, which all contribute to the uniqueness of modality of multiliteracies forms. As such, Squire (2013) argued that many video games are experiential with the aim to engage and immerse players in interactive gameplay. Jenkins (2002) also argued that video game spaces allow players to co-construct, deconstruct and reconstruct the plot. Jenkins (2002) also explained that game designers over the years have become narrative architects by developing games with narrative potential, enabling the story-constructing activity of players. These game-based immersive approaches help to create "an emotionally compelling context for the player" (Squire, 2013, p. 110). Further to this point, Squire (2013) argued that good games emotionally connect players and invite them into a world of learning. Jenkins (2005) similarly argued that games can imitate different art forms by offering players "new

aesthetic experiences and transform the computer screen into a realm of experimentation and innovation that is broadly accessible” (p. 3).

Educators sometimes consider video gaming as students' rich cultural out-of-school practices; however, more research is surfacing about transitioning these practices into in-school literacy experiences (Beavis, 2014; Cope & Kalantzis, 2009; Kalantzis & Cope, 2012). Video games involve complex forms of text, literacy and action where stories reveal a variety of genres (Beavis, 2014; Gee, 2003, 2007). Beavis (2014) urges educators to recognize the privileged place that students give to video games as a form of popular culture. She also sees video games as emergent cultural forms because they include stories that fuse words and images and other elements to reposition players as readers, writers, interpreters, and creators who play an active role in the stories. Video games have become increasingly rich in multimodal elements. Games are multilayered, intertextual, and exemplify literacy with the combination of words, pictures, sounds, colours, symbols, music, light effects, and movement (Ajayi, 2011; Beavis, 2014). These interrelations of text and visual images within video games form part of a multiple semiotic system, how we use signs. Semiotic systems are relied upon by meaning-makers in their knowledge designing processes (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012). Steinkuehler (2007) views interrelations of text in video games as gateways for meaning makers to rely on for “textually produced verbal interaction and, therefore, on story-telling” (p. 195).

Recently, Beavis (2012) conducted a study involving a mix of boys and girls aged 8 to 11 in Australia. She found that video games offer new ways of engaging learners with various forms of telling stories because they position the reader as both the player outside and within the story as active characters. Beavis (2012) also emphasized that games are participatory because they reinforce situated play, such as collaborative discussions with friends and other players, reading, working out strategies, reflecting on what happened and negotiating next strategies. Cope and Kalantzis (2009) identified that the interrelationship between written, visual, and audio representations helps meaning makers in their knowledge processes. The interplay of these representations within video games also contributes to meaning-makers developing perspectives which Squire (2013) said elicit “learners' pre-existing knowledge and beliefs” (p. 115).

Beavis (2012) recognized these interrelationships in video games by identifying that games are multimodal because they call on different elements to make meaning, such as sound, images, words, actions, colour, symbols. More importantly, some of these interrelationships in video games assume real-world contexts. It is within these contexts that Squire (2013) said learners collaborate, and “share stories, theories, and experiences with their products, further tying the learning experience to their work outside the learning context” (p. 115). Moreover, real-world contexts in video games offer ways for meaning-makers to develop critical perspectives about how the texts work, identifying values and assumptions in texts as they relate to the players' own perspectives and cultures (Beavis, 2012; Cope & Kalantzis, 2009; Kalantzis & Cope 2012). Squire explained that learners make a commitment to “confront these beliefs in a social setting ... and explain their choices, which makes their cognition visible to participants” (p. 115). In doing so, Squire (2013) argued that games offer players “opportunities for reflection”, creating a “mechanism for addressing conceptual changes” (p. 115). Beavis (2012) also recognized how narrative-based games help meaning-makers in their knowledge processes because players need to be familiar with the back-story and understand the interplay of the characters in order to play.

2.6.2 Bridging out-of-school practices with in-school literacy.

One study conducted by Huizenga et al. (2009) attempted to bridge the out-of-school history activity with in-school literacy content by using mobile game technology. Bridging out-of-school activities with literacy content value was consistent with Gee's (2007) claim suggesting that learning outcomes are based on situated learning, whereby, “researchers in several different areas have raised the possibility that what we might call ‘game-like’ learning through digital technologies can facilitate situated understandings in the context of activity and experience grounded in perception” (p. 114). Huizenga et al. (2009), determined that 21st century learners, known as the net generation (Annetta, 2008), use information technology on a daily basis to connect to each other, work interactively, often perform several tasks simultaneously, and play games more than the previous generation. Huizenga et al.'s (2009) project, conducted in Netherlands during 2005-2006, involved a game called Frequency 1550, which incorporated mobile technology, and hands-on exploration of history, particularly during the Middle Ages.

The game promoted social interactivity by placing students in teams—some physically navigating around the city with mobile phones, receiving maps and text messages to find points of interest. At the same time, other team classmates worked on main computers sending out those messages. The game involved students in learning the history curriculum by using a mix of game play and reality, thus creating a motivating learning experience. Huizenga et al. (2009) found “no significant differences ... between playing the game versus attending regular lessons with respect to motivation for the subject of history” (p. 339). Despite the non-significant findings, “those pupils who played the Frequency 1550 game generally attained higher scores on the knowledge test when compared to those pupils who received a series of regular project-based lessons” (p. 341). The study, conducted over a one-day period, may not have been sufficiently in depth for understanding patterns among the students.

2.6.3 Games supporting cognition and spatial reasoning.

The complexity of some video games is wide-ranging, especially those with narrative storylines, those that are interactive, or complex puzzle platformers (see diagram of games in section 4.4). These types of video games include some design features that can support cognitive skills, including spatial reasoning. Whether or not learners develop cognitive skills depends on how the player understands and uses the complex elements embedded within the game (Granic, Lobel, & Engels, 2013; Gros, 2007). According to Gros (2007), playing computer games can develop a particular spatial skill, but only to the extent that the player utilizes that skill and meets the criteria of progressing to certain levels throughout the game. Moreover, games also offer players the ability to develop different ways of thinking about literacy. Gros (2007) termed this spatial skill “divided visual attention” (p. 29), referring to ways that a player can develop strategies for comprehending multiple events at multiple locations, which could enhance students’ ability to articulate narrative plot events and characters.

Gros (2007) also stated that games involve conceptual learning, problem-solving skills, co-operation, and practical participation. Other design features of some games involve the interplay of semiotic sign systems and spatial representations skills, for example reading images (pictures and diagrams), interpreting text, and responding to paratexts to

shape learning processes (Gros, 2007; Gumulak & Webber, 2011; Sanford & Madill, 2007). Gumulak and Webber (2011) argued that young people play games for a challenge and entertainment. Their study, involving a majority of boys, concluded that the majority made meanings, solved problems, and especially gained competencies in reading and interpreting in-game texts and paratextual information, even beyond the games they played.

Furthermore, there is evidence that some games, and their surrounding online communities of practice, promote active learning. Learners exchange ideas and resources from fellow members to assist them in solving problems (Gros, 2007). Thus, through this ongoing social practice, learners begin to make meanings of the interplay of semiotics designed within the game. Online gaming communities resemble discourse communities of literacy and spatial narratives. Steinkuehler (2011) suggested that players are engaged in forms of multimodal textual play and “provide[d] the necessary sociocultural context for interpreting and understanding print text” (p. 4).

2.6.4 Games as alternative texts in literacy.

Video games are multimodal and represent complex forms of literacy by providing a textually rich environment, from online chat rooms between players to reading, and multiple modes of writing. Alexander (2009) argued that many of these games require high levels of reading, writing, and critical thinking. These types of video games offer multilayered literacy components, presenting players with opportunities to make sense of the interplay between text and visuals (Alexander, 2009; Beavis 2014).

Some narrative-type video games (see diagram of video games in section 4.4) are considered as alternative texts for players based on the parallel connections to a movie or novel. These parallel connections draw on the idea of paratexts, whereby players rely on external resources to frame and create new meanings and experiences (Apperley & Beavis, 2011). Exploring these paratexts allows players to develop critical literacy skills as they guide themselves through the gameplay and make attempts to understand the interplay of events, plots, and characters (Apperley & Beavis, 2011). Certain video games present players with research opportunities, when they explore paratextual information, by providing them with an understanding of the game as it relates to the design, history,

genre, aesthetics, or other features (for example, why games have levels or cut scenes). These types of games present the players with opportunities to critically understand the relationships between structure, visual and narrative content (Apperley & Beavis, 2011; DeCoito & Richardson, 1996). Jenkins (2006) recognized the paratextual value of video games but termed it as transmedia storytelling. He explained that transmedia storytelling offers a compelling and emotional experience for players because of its cultural context, including the backstory. With the advancement of video games having high-resolution digital effects, some video games used actual performers working on a set as extensions of digital characterizations. Jenkins (2006) sees video games as animated stories designed with interactive components expanding the storytelling experiences for players.

Recent research is beginning to emerge recognizing that video games, a multimodal form, can represent an alternative pathway to learning, both inside and outside of school. These multimodal forms provide a rich environment for gamers to interact with a variety of significant learning and literacy experiences, such as literacy reflectivity, trans-literacy connections, collaborative writing, and critical literacy development (see for example, Alexander, 2009; Apperley & Beavis, 2011).

As much as scholars recognize that some video games offer alternative forms of text literacy, this also suggests how educators should conceptualize literacy given the shift in multimodal demands of 21st century learners (Ajayi, 2011). The literacy aspect involved in alternative texts is often not valued in school because of pop culture associations. In a study by Sanford and Madill (2007), literacy skills were being practiced by participants playing video games and using alternative texts in surrounding networks by means of reading non-linear, multi-layered, intertextual texts and other semiotic sign systems, such as visual images, music, and written text. Jenkins (2006) echoed the notion of learners using alternative texts by indicating that narrative type video games include complex, nonlinear media combining multiple arrangements of the content for players to discover.

Hommel (2010) calls attention to how gameplay promotes literacy by introducing players to the contextual gameplay experience. Intertextuality occurs throughout gameplay by engaging learners to interact with the game's specialty languages, images and other semiotic sign systems. Video games can be ideal alternative texts for in-school literacy

because assessment is not separated from learning; assessment and feedback is continuous throughout gameplay. Hommel (2010) explains that video games provide the player with instructional techniques, without interrupting the gameplay to assess the player's skill level and mastery.

2.7 Gender debates

2.7.1 Examining boys' discourse and exploring the gender gap.

Weedon (1997) theorized that ways of thinking about femininity and masculinity can vary between discourses. The term discourse, Weedon (1997) explained, originates from the French theorist Foucault who attempted to understand the relationship between language, social institutions, and power. Foucault (2007) reasoned that discourse could represent a way of using words when speaking within historical contexts. In other words, discourse shapes people's perception. Weedon (1997) urged us to believe that discourses involved more than a way of creating various meanings. Therefore, with the idea in mind about creating various meanings to shape our perceptions about a concept or topic, I focused on particular discourses that have shaped or influenced our understanding of boys' masculinity, and the gender literacy gap. Therefore, in order to develop my research context about boys' underachievement, which may be addressed through their video gaming practices, I focused on the following major discourses: whether boys learn differently from girls; evidence of boys' underachievement; and video games as a tool to address boys' struggle with literacy.

2.7.2 Video game limitations: gender and literacy.

Research about video game content relating to literacy is considered somewhat limited by some scholars who have suggested risks about using video games as an alternative classroom strategy (see for example, Ajayi, 2011; Akkerman et al., 2009; Alexander, 2009; Foster, 2009; Gee & Levine, 2009; Gros, 2007; Kalantzis & Cope 2012; Sanford & Madill, 2007). The hesitation to use video games in the classroom is partly due to a recurring theme that video game content can influence boys, and therefore construct negative identities (see for example, Gros, 2007; Sanford & Madill, 2006). Kristie (2008) claimed that the transition of video game skills to in-school literacy practice can

occur, and noted that “once students were made aware of books based on video games and began reading them, they started to generate a lot of opinions, which they used to form their reading identities” (p. 84). Boys who interact with video games and apply that knowledge to in-school practice are considered problematic due to scholars’ significant reservations about stereotypical themes embedded in video game plots and characters (for examples, refer to Alexander 2009; Sanford & Madill, 2006, 2007; The New London Group, 1996). Ajayi (2011) shared concerns with Alexander (2009) who argued a “connection between gaming and violence ... (do video games promote sexist images of women, or men?)” (p. 38). Therefore, part of this gender debate is concerned with how youth, particularly boys, have perceived themselves and constructed their identities when they have played these video games.

2.7.3 A gender gap: Interplay of multiple masculinities in video games.

Research about gender roles in video games has been widely focused on the representation of male versus female characters, particularly the absence of certain gender types in players within the gaming communities (see for example, Garris, Ahlers, & Driskell, 2002; Jansz, 2005; Jenkins, 1998; Konijn, Bijvank, & Bushman, 2007; Leonard, 2003). In most cases, for video game characters and various players, the word gender is defined as either male or female or boys or girls (see for example, Ajayi, 2011; Alloway & Gilbert, 1997; Apperley, 2010; Compton-Lilly, 2007; Garris, Ahlers, & Driskell, 2002; Ke, 2008; Leonard, 2003; Mifsud, Vella & Camilleri, 2013; Squire, Devane & Durga, 2008). Absent from this definition, is the inclusion of boys with multiple masculinities (Connell, 1996). Furthermore, the majority of video game discourses refer to boys as being stereotypical in their behaviors (see for example, Alexander, 2009; Beasley & Collins Standley, 2002; Dietz, 1998; Dill, Brown & Collins, 2008; Kalantzis & Cope 2012; Leonard, 2003; Sanford & Madill, 2006, 2007; Skelton & Francis, 2011), even though boys have access to varying constructions of masculinity (Lingard & Douglas, 1999). These discourses, about boys and video games, generally focus on assumptions made by scholars, such as Sanford and Madill (2006) who argued that boys will assume stereotypical behaviors, because “hegemonic masculinity ... naturalizes male behaviors” (p. 3). Some of these assumptions can be associated with

how boys respond to video game content, but also motivating factors by boys to play certain video games (Sanford & Madill, 2006).

Jenkins (1998) argued that boys are motivated to play video games, even beyond physical and emotional exhaustion, in order to master a skill determined to be important. Boys' persistence to play a game until a skill is mastered suggests a growing video game culture for boys, which Jenkins (1998) understood as a motivation for boys to displace the need for outward physical violence. Jansz (2005) further explained that some adolescent video game players have an emotional appeal to violent video games and "are not thwarted by the responsibility for committing violent acts in the virtual world of the game. These games apparently exert a strong appeal on their audience that supersedes moral reservations" (p. 224). Jenkins' (1998) assumptions and understandings about boys re-examined the theme of boys returning to masculine patriarchal views, and their motivations to be included in this growing video game culture. In so doing, Leonard (2003) argued the popularity of video games not only reflects the ability to consume the "other," to occupy the unknown, and visit the dangerous, but it also speaks to the power garnered through this relationship of domination" (p. 5). Although lacking from these arguments is when boys play video games they may rely on multiple masculinities when responding to video game content containing stereotypical patriarchal perspectives (Mac an Ghail, 1994).

In a similar way, Konijn, Bijvank, and Bushman (2007) reviewed boys' aggressive behaviors from their responses to playing certain types of video games. Their study claimed that participants were vulnerable to the negative effects of violent video games, focusing particularly on boys with a low level of education, although this vulnerability was not well-defined. Konijn et al. (2007) advised their study was limited because they did not confirm all of their hypotheses. Namely, they expected their participants who had high tendencies of aggressive behavior, or "sensation seekers," to have a higher likelihood to "identify with violent characters" (p. 1041). Konijn et al. (2007) concluded that these sensation seekers were not significant in numbers. They also emphasized that their study involved gender identification, which did not influence aggression levels (Konijn et al., 2007). Furthermore, their study lacked consideration of boys' sense of

their masculine identities (Lingard & Douglas, 1999), and made several assumptions about boys' behaviors and motivations.

Part of this discourse about gender roles being limited in video games to female or male characters is driven by the media, which Dietz (1998) claimed "affects the child's definition of gender" (p. 428). At the same time, Dietz (1998) argued that the youth, not specifically boys, who generally are motivated to play video games that present "traditional and negative portrayal of women" (p. 426). Dietz (1998) later contradicts this by commenting that female characters are portrayed in a positive form, in certain video games, such as the "hero princess" in *Super Mario 2* (1988). Similarly, Beasley and Collins Standley (2002) conducted a review of video games focusing on the portrayal of women and made conclusions about gender role stereotyping without consideration of how boys express their masculinity, and/or respond to the character choices within those types of games.

Olson (2010) conducted a different study, which examined children's motivations for playing video games. This study involved a survey of 1254 adolescent-aged children and focus groups with 17 boys. Olson's (2010) rationale for conducting this study was the growing research about potential academic skills learned from electronic games. Olson (2010) initially determined that boys were strongly motivated to play video games for competitive reasons but later determined youth play video games to socialize. Jansz and Martens (2005) conducted a similar study with adult male participants at a large-scale computer gaming event to understand how video gamers are motivated online and face-to-face. The findings indicated that the players were significantly motivated to attend the event based on social interest, with less emphasis on competition. Jansz and Martens (2005) further claimed that these socially driven interests of players were associated with their desires to "exchange information about (new) video games and gaming practices" (p. 349). When players meet to communicate and mentor each other about video games it is an example of Experiencing (Cope & Kalantzis, 2009).

Moreover, Olson (2010) claimed that over half of the girls in the survey enjoyed the competitive side of gaming when they regularly played video games. Olson (2010)

emphasized that both boys and girls gained satisfaction from teaching others how to play, both in competition and in mentoring, thus neutralizing results among gender categories.

Other findings included opportunities for relaxation and leadership for both boys and girls. The fact that there was no significant difference in results for boys and girls appeared to be the result of the variation of characters available in these games. Olson (2010) attempted to bridge the gap relating to how children could respond in different ways to gender, by explaining that in “virtual worlds and multiplayer online games, children can design characters that look like them or they can try out looks that represent different ideas about masculinity and femininity” (p. 183). Olson (2010) minimizes concerns about violent video games by suggesting that youth may be motivated to play these games as a “means to deal with fear – similar to books, movies and other media” (p. 186). Jansz (2005) also identifies a theory that boys play video games as a coping mechanism for fear, as a motivator. Moreover, Jansz (2005) suggested that male gamers often explore their own identities by using different virtual identities and reasoned that this way of portraying different identities helped these male game players to cope with certain insecurities associated with adolescence.

2.7.4 Identity.

Another area of complexity has been the gendered aspect of video games, which I argue may cause concern for use of video games in schools. Sanford and Madill (2006) and Gros (2007) express significant reservations. Alexander (2009) also highlights this risk of negative identity construction in video games, by suggesting there is a “connection between gaming and violence ... or the promulgation of stereotypical forms of identity in gaming spaces” (p. 38).

Furthermore, Kimmel (1994) and Martino (1999, 2000) indicated that a dichotomy exists between teaching literacy skills from video games, and educators and peers navigating and policing some of these social and moral obligations associated with gender constructions (as cited in Brod & Kaufman, 1994). Despite this cautionary position, Alexander (2009) argued that the scholarly literature at the time lacked insight about how video gamers perceive their own learned literacy skills from playing video games. Alexander's (2009) position suggests video game players did not choose video games to

construct identity but for collaborating and connecting socially with other gamers while developing multiliteracies skills. Alexander's study (2009) involved two university students reflecting on their gaming activity using the video game "World of Warcraft" (p. 41). While observing students playing video games, Alexander (2009) remarked on the effectiveness of communication strategies based on students' ability to develop literacy reflectivity, transliteracies, collaborative writing and multicultural literacy. Furthermore, a study of 800 youth (boys and girls), conducted by Ito et al. (2008) in the United States found that most youth engage in video gaming in order to connect with others, socialize with friends, counter boredom and self-direct peer-based learning, or explore other interests outside of school. Ito et al. (2008) also found that youth gained interest in other forms of online research from gaming. They found that youth who are "deeply invested in specific media practices often described a period in which they discovered their own pathways to relevant information by looking around with the aid of search engines and other forms of online exploration" (p. 21). To further my understanding of these gender debates, and how to incorporate my feminist post-structural lens, I want to explore some of the history of the feminist landscape.

2.7.5 Feminism and my post-structural lens.

Because my research encompasses boys' multiliteracies and cultural knowledge (see definition of terms in section 1.7), I want to briefly introduce feminist post-structural theory and gender equity. Mac an Ghail (1994), Connell (1995), and Lingard and Douglas (1999) focused on the need to identify how boys may choose to construct multiple masculinities and not rely on the stereotypical forms of hegemonic masculinity, and thereby navigating the gender equity concerns in school. My research focuses on raising awareness about some boys' learning processes by deconstructing and exploring surrounding context within dominant discourses that boys tend to focus on violence and negative identity constructions when they engage in video gaming (Ajayi, 2011; Akkerman, Admiraal, & Huizenga, 2009; Alexander, 2009; Sanford & Madill, 2006).

Feminism is not meant to be vertically linear, it should be evolving and open to addressing fair social change, equitable to all genders: boys (and their multiple masculinities), girls and Lesbian, Gay, Bisexual, Transgender and Questioning (LGBTQ).

Disconnects can occur as circumstances and individual identities who exist in society continuously change, along with political and social agendas meant to support those individuals. Weedon (1997) argued that individuals in society continuously change discourses based on circumstances in society causing changing power relations between women and men. In addition, Weedon (1997) countered this idea of changing power relations with the understanding that in society each individual is subjective, which can cause conflict. Each individual being subjective in society aligns with Bourdieu's (1984) reasoning of symbolic power among the social classes, which relates to the core of culture, whereby humans struggle to legitimate their beliefs, perceptions and knowledge. From an educational perspective, Bourdieu (1984) believed that old style academics, part of a disinterested culture, which can affect the educational institutions, may limit the production of legitimate cultural practices. I embrace an ontology/epistemology of constructivism/subjectivism, which incorporates multiple perspectives of reality. Therefore, poststructuralism seems the best choice for me, because it closely aligns with constructivism. Richardson and St. Pierre (2005) refer to how one's subjectivity is constructed because it "links language, subjectivity, social organization, and power. The centerpiece is language" (p. 961). In consideration of 21st century societies, I questioned whether the tenets of feminist poststructuralism can adequately address issues and ways of knowing how men and women interact, given that feminist agendas rely on a Marxism and civil rights' foundation (Molyneux, 2013). Bourdieu's (1984) main complaint was a lack of balance between men, women, and classes. Bourdieu reasoned that the dominating classes represent the self-interested who hold the power to impose their ideologies and to define legitimate principle domination of economic, educational, or social capital on the dominated classes.

Of course, it would not make sense to support re-masculinization of schooling because this would result in reducing aims of gender equity. Lingard and Douglas (1999) recognize that schools are failing boys and many education reform policies tend to use binary conclusions in research in order to address these issues. Lingard and Douglas (1999) are surely right because education agendas about gender equity need inclusive policies recognizing multiple masculinities as a gender identity. Many current education reform policies suggest development of male-oriented curriculum and hiring male

teachers (Ontario Ministry of Education, 2009). Lingard and Douglas (1999) rejected these types of reform policies for boys' schooling because they promote hegemonic behaviors for masculine stereotypical boys.

Weedon (1997) explored the notion of extending post-structural feminist theory to assimilate equity feminism (see Gardiner, 2005; Holter, 2005; Lorber, 1994) by suggesting removing categories for women and men. This extreme notion, risks further ambiguity for gender (for example boys who enact multiple masculinities and or LGBTQ) and perpetuates a homogeneous society. Politically this would not legitimate any group to have privilege or to have voice. Foucault (1977) also cautioned, "the power of normalization imposes homogeneity" (p. 184).

Given these feminist perspectives, I found my research problem also addresses social hierarchy groups in some ways in relation to struggles between these two groups. Bourdieu's (1984) theory on interplay of societal hierarchies may shed light on boys' issues today, in that culture connects individuals and groups but also encourages power relations among those groups. Bourdieu viewed hierarchies in societies as individuals and groups competing for their special interests, causing further issues with social status. Bourdieu believed that these social hierarchies transformed into one-sided academic hierarchies of special interest groups. In some ways, the theory about social hierarchies reflects how boys who construct "multiple masculinities" (Lesko, 2000) manage to navigate this educational and cultural landscape and have an affiliation with video gaming outside of school.

I designed this ethnographic study in order to discover the boys' meaning-making multiliteracies skills and development of cultural knowledge within their own social context, as part of the Experiencing of visual representations outside of school (Cope & Kalantzis, 2009). Encountering boys' voices within their own social context, outside of school, allowed me to understand the gaps and issues facing some of the boys in their learning processes that may help them to achieve improved literacy. This ethnographic approach enabled me to hear their voices, to understand their meanings from engaging in video gameplay, and to learn about their perceptions of their cultural experiences, both inside and outside of school.

2.7.6 Multiple masculinities in the gendered landscape.

I will briefly examine the literature about boys' literacy, video gaming, and boys' performance of masculinity. Some scholarly and media-driven discourses reveal a recurring expression of dominant definitions of masculinity (Mac an Ghaill, 1994). Within the domain of masculinity, I recognize that there are several perspectives about masculinity (Kaufman, in Brod & Kaufman, 1994). For instance, although Messner's (1993) theory tends to focus on body image, he recognized dynamic and different ways that males express their masculinity. Messner's masculinity discourse represents a fluidity of identities (Butler, 1990), specifically focused on sports, which appear to be relational to men, rather than to adolescent boys. Furthermore, he examined how men's body image magnifies athletic activities, and how men's behaviors, especially aggression, are magnified in violent actions associated with sports, such as football. Although Messner's (1993) theory of male body image is an important domain of research, it is not adequate to support my research problem, which relates to adolescent boys engaging in video gaming practices. Therefore, I needed to find scholars, whose works related to multiliteracies and video technology domain.

Coltrane's (1994) work, focused on masculinity roles and how they have manifested in traditional curriculum subjects. Much of Coltrane's (1994) work is situated within the scientific discipline, which traditionally dominated this subject area for men. The scientific discipline has been the stage for many gender inequity issues, specifically for females who have desired to enter this field. Harding (2004) echoed this fact, focusing on the marginalization of women who enter the scientific domain of research. Both Coltrane's (1994), and Harding's (2004) claims are grounded in social power relations between men and women in the scientific field. This power dynamic also appeared in Kaufman's (1999) research, which examined men's roles in society. Kaufman (1999) also focused on the hegemonic forms of men's behaviors causing the social dynamics between men and women. In addition, Kimmel (1994) used a similar lens, specifically highlighting dominant forms of masculinity to understand gender equity issues within families. These discourses revealed a gap in the literature because they specifically focused on hegemonic (see for example, Pease, 2000) forms of masculinity, rather than

highlighting that adolescent boys can construct multiple masculinities (see for example, Connell, 1996; Lesko, 2000).

I wanted to examine the literature further to find theories about boys, masculinity and schooling; since my research problem addresses the ways that adolescent boys play video games to explore meaning-making, develop cultural knowledge (see definition of terms in section 1.7) and potentially address literacy in school. I found Smith and Wilhelm's (2002) work particularly useful for my research because they conducted their longitudinal study on ways that boys of various ethnic backgrounds learn literacy within a United States high school. They also focused on boys' interests outside of school, which is closely aligned with my research problem, as I am focusing on video game practices by boys outside of school, and how these interests can help in their learning processes. Interestingly, Smith and Wilhelm (2002), conducted their study with ethnic boys, even when the US National Assessment for Educational Progress (NAEP) (2012) reported that, over the last 40 years, the gap in achievement levels has narrowed for Black and Hispanic boys, while the gap for boys of Caucasian background has remained unchanged.

Smith and Wilhelm focus their research on boys identified as stereotypical or biologically determined. I found using their research, as a lens for my work, challenging as they did not incorporate a broad sense of boys' masculine identities (Lingard & Douglas, 1999; Lingard, Martino, & Mills, 2009, 2013). Based on that, I began to review the works by Lingard and Douglas (1999) and Lingard, Martino and Mills (2009, 2013). Their research found neo-liberal policies problematic because these governments were using standardized testing, failing to distinguish in the data between which boys and which girls were performing poorly. Lingard, Martino, and Mills (2009, 2013), cautioned that these neo-liberal policies would also support masculinization of schooling; therefore, they recommended that boys should learn from caring models to enable them to resist cultural pressures of hegemony. Their views resonate with me, specifically the risks of masculinization of schooling and the need for improving gender equity in schools. Their discourse, similar to that of other scholars', focused on boys' performance of masculinity to be "dominant or hegemonic" (Connell, 1995, pp. 82-83), instead of viewing them as being capable of constructing a diversity of masculinities (Connell, 1995).

Mac an Ghail (1994), also directed their research efforts on boys' schooling, particularly adolescents in high schools, and used arguments similar to those of Lingard and Douglas (1999). Mac an Ghail (1994) claimed that most English secondary schools promote extensively dominant masculine perspectives. Based on this risk and my own understanding, my research aim was, if at all possible, to conduct the research outside of a regulatory institution, like a school, which could potentially influence the ways in which participants choose to enact their masculine personality traits and share their voices. Mac an Ghail (1994) recognized that gender and heterosexual divisions are predominantly generated within school cultures. Although Mac an Ghail (1994) focused much of the discussion on how a teacher's perspective and authority in the classroom can affect boys' learning, he also recognized the dynamics of peer group relations. He argued that male sub-cultures within school hierarchies cause policing action among peers. Although heterosexual discourse is presented by Connell (1996), who framed boys' masculinity as being specifically dominant (p. 228), I found balancing the gender debates would be more feasible using Connell's (1996) idea of multiple masculinities. Connell (2000) defined masculinities as including patriarchal forms of dominance "while others are subordinated or marginalized" (p. 10). Although Connell (1996) often related to the "stereotypical images of violent masculinity" (p. 209) found in games, Connell (1996) also understood that "boys are not a homogeneous bloc, that masculinities vary and change" (p. 230). Connell (1996), also believed that boys are continuously exposed to social media, and because of this it is particularly difficult for them to navigate among school peers and micro cultures that shape identities. Connell (1996) argued that "schools are routinely blamed for social problems affecting boys. It is, therefore important to register the fact that the school is not the only institution shaping masculinities ... the mass media are crammed with representations of masculinities" (p. 211). By conducting my study with adolescent boys who played video games outside of school, I attempted to limit any micro cultural influences from peers, to understand the ways boys would express their masculine identities, and to observe how they would approach learning using these video games. Because I specifically focus on adolescent boys discovering their cultural knowledge, I needed to review any gaps in the literature on how boys engage with video games to potentially develop literacy practices.

2.8 Video games and learning opportunities

2.8.1 Why choose video games to address boys' multiliteracies and cultural knowledge?

As a starting point for the context of my research, the OME (2009) suggested that video gaming can excite a passion in boys who rely on spatial learning skills. Further to this suggestion, Cope and Kalantzis (2009) defined one of the available designs, visual, to include moving images, although not specifically identifying video game technology. Moreover, some scholars, such as Gurian and Stevens (2010a, 2010b) offered yet another explanation, which may contribute to how boys approach meaning-making. Gurian and Stevens (2010a, 2010b) point out that boys are more likely to draw on their spatial abilities (such as non-verbal cues and pictures) to think. Given these novel approaches to learning, my research problem is situated well within video games, which are embedded with symbols and images as well as narrative qualities (Apperley & Beavis, 2011; Gee, 2003, 2007; Sanford & Madill, 2007; Squire, 2013; Steinkuehler, 2007, 2011; The New London Group, 2000; Van Sledright, 2002). As much as boys draw on their spatial skills, such as moving pictures, to think, I needed to understand if video games contain any elements that provide learning opportunities for boys. Thus, I reviewed a number of video games that have been designed with narrative elements which have existed for more than 40 years. For example, I looked at interactive, role-playing adventures, such as *Dungeons and Dragons* (a role playing game) (Gygax & Arneson, 1974), and the *Colossal Cave Adventures* (Crowther & Woods, 1977). Using video games as an alternative classroom strategy to other literacy strategies, such as reading books, may support available visual and audio designs (Cope & Kalantzis, 2009) for boys' learning. This alternative classroom strategy, although supported by the OME's (2009) recommendation to embrace digital literacy, could be labelled as boy-friendly (see for example, Frank, Kehler, Lovell, & Davison, 2003; Greig, 2003; Kehler, 2007, 2011; Lingard, Martino & Mills, 2009; Lingard, Martino, Mills, & Bahr, 2002; Martino, 2013; Martino & Berrill, 2003; Martino & Rezai-Rashti, 2013; Maynard, 2002; Skelton & Francis, 2011) or stereotypical (see, for example, Alexander 2009; Sanford & Madill, 2006, 2007; Steinkuehler, 2010). Scholars have suggested that some of the stereotypical themes do not serve boys' learning needs as they may focus on these images which have

often been identified in some of these video games which may promote toxic masculine traits (Connell, 1996; Lingard & Douglas, 1999; Mac an Ghaill, 1994). Therefore, video games used for educational purposes would need to address more than just the ways that boys draw on spatial abilities to support cognition, such as recognizing moving images. Spatial abilities often refer to thinking patterns in the brain, which is incorporated within the definition of the available designs put forth by Cope and Kalantzis (2009). Furthermore, Cope and Kalantzis (2009) also refer to cognitive learning processes within conceptualising pedagogy.

It is true that video gaming may also seem boy-oriented; however, video games can have multiple target audiences, and can be used as more than an isolated strategy for conforming boys, just as a selection of books for boys can be stereotypical. I agree with Gee (2007) who argues that in worldwide multiplayer gaming, “games are introducing new ‘states’ (6 million people worldwide for World of Warcraft or ‘communities’ into the world” (p. 20). These worldwide communities represent forms of online collaboration and invite diverse identities where players create their characters that may or may not represent national and local identities of those players. In order to understand the diverse identities exhibited by online gamers, we need to take into account the complicated role one’s offline location and national identity can play within the game space. Although there are certainly success stories of people having their stereotypes undermined or challenged, there are also many instances along the way in which practices and opinions may work more conservatively (Taylor, 2006, p. 6).

Furthermore, in addition to scholars such as Alexander (2009), Ajayi (2011), and Gros (2007), Steinkuehler (2006) commented that communities of players in online gaming recruit and share diverse values and identities when they play “massively multiplayer online games (MMOGs)” (p. 199).

2.8.2 Video games support multiliteracies skill development.

In this section, I discuss the field of research that has advocated using video games as a classroom strategy for literacy. Using alternative literacy activities, such as video gaming, as a classroom strategy, may be key to understanding boys’ meaning-making and knowledge development. In my view, there is a lack of concentration in using video

games for educational purposes because games have long been noted to embed narrative components. In some cases, teachers use film as a supplement to text to convey learning by visual means.

Many types of games, some used by the four boys who participated in my study, contain narrative components, and continue to be developed today, such as *Never Alone (Kisima Innitchuna)* (Upper One Games, 2014); *Super Smash Bros. Melee* (HAL Laboratory, 2014); *Half-Life 2* (Valve Corporation, 2004); *Dota 2* (Valve Corporation, 2009); *Counterstrike* (Valve Corporation, 2000); and *Undertale* (Fox, 2015). Additionally, more than 40 years ago, a text story video game existed called *Adventure* (Crowther & Woods, 1977). Video game sophistication has also improved from text only to highly simulated 3-D, and new generation virtual gaming. It is evident that today's students play video games in large numbers, enjoy playing video games, and learn from playing video games (Granic, Lobel, & Engels, 2013). There have been numerous studies conducted to ascertain the percent of the population that is playing video games. The results range from 59% in Canadian households playing a few times a week (Entertainment Software Association of Canada (ESAC), 2011) to 67% of American households (Ching, 2012). ESAC reported that of those Canadian households, 90% of children aged 6-12 and 80% of children 13-17 are playing video games. More recently, Granic, Lobel, and Engels (2013) reported that over 90% of teenage girls and close to 100% of teenage boys play video games (cited in DeCoito & Richardson, 2016). Video gaming practices have been growing in popularity among adolescent boys and girls. Some scholars, such as Hommel (2010), recognized that youth could learn by using video games. Hommel (2010) explained that "this type of education is going on with students every day—but it is not happening in schools ... 97% of youth ages 12 to 17 play video games ... their gameplay is ... social and fosters civic engagement" (p. 37). The idea of youth learning from video games is continually echoed by emerging research that recognizes the benefits and challenges of integrating video games in the classroom as a pedagogical strategy for 21st century students to gain literacy skills (Beavis, Muspratt, & Thompson, 2015; DeCoito & Richardson, 2016; Duret & Pons, 2016). Hommel (2010) also highlighted that many researchers argue that meaningful learning, including critical thinking, problem-solving, decision-making in video games may model engaging and effective instructional

techniques. This deep learning perspective, which can be applied to boys, is echoed by several scholars, such as Alexander (2009), Apperley and Beavis (2011), Huizenga et al. (2009), and Sanford and Madill (2007), who noted a growing interest in adolescents, particularly in boys, to engage in both video game play and in design and creation of video games. They also commented that both of these interests combine numerous complex literacy skills in one activity. Duret and Pons (2016) advocated that “the attention to the intertextual nature of video games holds great potential to inform high school English teachers as they help youth navigate the interconnected communities of the 21st century and to engage their students in a wide array of multimodal texts” (p. 121). Although Duret and Pons (2016) also cautioned that “teachers in schools often either avoid or show disdain towards video games as they are seen as frivolous pursuits that often promote violent or misogynist values” (p. 121). Gee (2007) described it best when he referred to an example of games having linguistic qualities because they embed language in action (Cope & Kalantzis, 2009; The New London Group, 1996). He further suggested that video game play involves collaboration and participation by teaching us about engaged thinking and learning.

Both Gee (2003) and Squire (2013) have strongly advocated claims that literacy content exists in video games. Squire (2013), explained that games are now recognized as experiential learning spaces where learners engage in rich collaborative interactions, and where they can utilize a variety of complex tools in order to develop complex problem-solving skills (see for example, Alexander, 2009; Gros, 2007). At the same time, research has emerged about how video gaming practices can lead to various multiliteracies skills, such as problem-solving, strategy, analysis, and literacy (see for example, Gee, 2007; Squire, 2013; Squire, DeVane, & Durga, 2008; Squire & Jenkins, 2011; Steinkuehler, 2010; Steinkuehler, Squire, & Barab, 2012). Scholars, such as Ke (2008), claimed that the literacy levels embedded in video games would be worthy for integration in the curriculum.

In addition, most video games contain narrative elements resembling books (characters, plot, etc.), thus offering boys opportunities to engage collaboratively in online discussions with other gamers (see for example, Gee, 2003, 2007; Steinkuehler, Squire & Barab, 2012). For example, Alexander (2009) indicated that online communities of

practice (Wenger, 1998), characterized by numerous message boards, represent ways for learners to actively build their literacy skills, such as onscreen writing, listening, critically reflecting, and thoughtfully responding. Similarly, Aarsand (2010) conducted a one-week ethnographic study involving two boys and two girls, aged 7-8. They found that the children constructed meanings concerning methods to play the game. More importantly, they noted that gameplay competence and valid knowledge was central to peer group activities, even in the playground. These shared competencies used strategies for the children to interact socially and organize self-initiated activities (Aarsand, 2010). The study was not clear as to the nature of what the boys learned and whether they played specific games. Additionally, as the study involved both boys and girls aged 7-8, it would be difficult to draw conclusions from that study to provide me with insight specifically about adolescent boys developing cultural knowledge (see definition of terms in section 1.7). I argue that both the narrative and collaborative elements of video games, if applied by boys, can enrich literacy practices. What we know from Gee (2007) is that each player plays the game on an equal playing field by sharing knowledge and collaborating. He highlights that players share knowledge and collaborate because they are “organized around a primary affiliation to their common goals and endeavors, and use their cultural and social differences as strategic resources, not as barriers” (pp. 151-152). Both, Steinkuehler (2010) and Gee (2007) have explained that the designs of most popular games with storylines often allow gamers to interact with other gamers in online networks situated around the games’ challenges. According to Kain (2013), some of these popular games include titles such as Knack, DeepDown, The Witness, The Wolf Among Us—detective story, Path of Exile, and Black Flag, (<http://www.forbes.com/sites/erikkain/2013/11/01/the-best-video-games-of-october-2013/>).

Furthermore, video games involve a multitude of elements (such as sound, text, image, interactivity and collaboration among players online) that provide a foundation for motivating gamers and learning various multiliteracies skills (see for example, Ajayi, 2011; Annetta, 2010; Gee, 2003, 2007; Van Sledright, 2002). I also agree with scholars, such as Gee (2007), who often suggest that good video games can challenge us to “truly integrate cognition, language, literacy, affect, and social interaction in our ideas about

learning and the organization of learning inside and outside schools” (p. 19). Moreover, Alexander (2009) is surely right about learners reacting cognitively during video game play. He claimed that “some gamers are actively engaged in developing high-level literacy skills such as literacy reflectivity, trans-literacy connections, collaborative writing, multicultural literacy awareness, and critical literacy development” (p. 37). Some of these critical reflective skills were strongly evident in the data (see Chapter 4), where some of the boys used new skills to design games and facilitate learning for peers, which resembled what Cope and Kalantzis (2009) called applying. Students in the study conducted by Dezuanni (2010) also demonstrated these types of skills. These students designed video games and shared their information on blogs. Video games that integrate a layer of interactivity, I argue, can provide gamers with opportunities to become agents in actively creating characters and plot through design, which can support rich literacy skills. Jenkins (2002) explained that this form of agency can be found in the flexibility and interactivity of some narrative video games, which are designed with challenges one must face, such as battling our way past antagonists, navigating through mazes, or figuring out how to pick locks, in order to move through the narratively impregnated *mise-en-scene*.

In fact, Beach, Appleman, Hynds, and Wilhelm (2006) found that “films, television programs, and video games provide narrative versions of reality” (p. 199). Beach et al. (2006) go on to explain that,

Playing interactive, role-play video games, such as “Sims”, students are participating in interactive storytelling that draws on traditional narrative forms (Lemke, 2003). Game characters interact with each other based on certain narrative scenarios ... This suggests the value of drawing on game design to create classroom simulations or activities that serve to foster students’ sense of agency through their display of competence. (p. 200)

Alternative forms of literacy practiced by today’s video game players continue to reinvent traditional narrative forms. Steinkuehler (2007) stated that when students engage in literacy practices, such as interactive storytelling in video games, they produce and

consume “orally delivered narratives and poetry.” She argued that “individuals adopt and adapt designed-in elements of the game narrative to craft their own ‘oral’ story-telling performances” (p. 193). Similarly, Jenkins (2006) recognized the narrative embedded qualities in video games. He referred to video games as offering transmedia storytelling experiences, which combine movie making into the architecture of video games. Jenkins (2005) suggested that games had progressed to the “sophistication of Final Fantasy, a participatory story with cinema-quality graphics that unfolds over nearly 100 hours of play” (p. 1). Video games, as interactive mediums, invite players to engage with multiple layers of semiotics, which in turn is a form of literacy (Steinkuehler, 2011). Jenkins (2000) explained that game designers attempt to balance storytelling and interactivity in order to provide players with “the freedom they want and still provide an emotionally satisfying and thematically meaningful shape to the experience” (p. 4). Game designers who create these in-game designed narrative elements, according to Jenkins (2002), do not just tell the stories, but design worlds and sculpt spaces, which he refers to as environmental storytelling. In this way, players can engage with the spatial representations within the gaming environment in order to design meanings (Cope & Kalantzis, 2009). Jenkins (2002) explains that designers draw on story elements from existing film or literary genres, such as fantasy, adventure, science fiction, horror, and war, to achieve environmental or spatial storytelling. Therefore, if video games are richly embedded with literary genres, they may more fully realize the spatiality of stories and provide players with a much more immersive and compelling representation of their narrative worlds (Jenkins, 2002).

Although some scholars have minimized the literacy value gained from video game practices, they have argued that the extensive work conducted on assessing the design and development of games by Gee (2014) and Steinkuehler, Squire and Barab (2012), was largely based on social learning, problem-solving or computer literacy approaches, rather than specific transferable literacy value such as reading or writing. Past research indicated from one such scholar, Gros (2007), that children’s interaction with video games introduced them to computer skills useful for science and technology preparation, thus less focus on literacy. Akkerman et al. (2009) and Huizenga et al. (2009) echoed this theme. Game design and creation resemble concrete ways for learners to build

metacognitive skills and to apply knowledge and creativity (Cope & Kalantzis, 2009; Kafai, Burke, & Steinkuehler, 2016). Some scholars indicate the need for increased use of multiliteracies combined with cultural diversity (Ajayi, 2011). Video games can support learners' multiliteracies by inviting them to not only develop their ability to manage complex systems, computations, and graphic manipulations, but also to engage players in collaborative peer-based forums to discuss theories about gameplay, strategy, and problem-solving (Kafai, Burke, & Steinkuehler, 2016). These online forums represent a common literacy practice for video gaming communities that Steinkuehler (2007) termed as metagaming practices, and she defined as spaces

In which participants theorize their own game, both within the virtual environment of the game world itself and beyond it in the online fandom space (e.g., website, discussion forums, chatrooms, blogs, wikis, and sundry other online text) that envelops every successful title to date. (p. 196)

Meanwhile, a number of other multiliteracies skills appeal to students' abilities in logic and design. Squire, DeVane, and Durga (2008) reviewed many case studies that focused on engaging secondary students in meaningful learning. Participants included twelve fifth and sixth grade students, mostly African-American and low social economic status (SES), and the goal was to determine the link between their motivation to learn history and redesigning a video game. Some simulation games can immerse students in historic representations of the world, which may provide problem-solving skills and interpretative frameworks for cross curriculum subjects, such as history (Squire, DeVane, & Durga, 2008). Redesigning a video game was an alternative model for game-based learning, which intersected learners' identities in and out of school, but also touched on their own experiences and design skills for a history project. Squire, DeVane, and Durga (2008) explained, that the project "examined whether an open-ended game (Civilization III) can engage children who are normally alienated from school in more advanced academic thinking" (p. 241). The students actively applied knowledge (Cope & Kalantzis, 2009) as they became producers and active learners by modifying the design elements of this particular game, rather than consumers of information. Squire, DeVane, and Durga (2008) reported that "players developed an affiliation for history that fueled their

gameplay” (p. 249). This study illuminated how students who had designed as well as played a video game improved their learning skills.

Therefore, I argue, it is possible that video games embedded with these rich narratives can provide the foundation for building multiliteracies skills. If boys enjoy playing these games, their interest and passion might motivate them to learn. This type of connection between deep learning and having fun playing video games is summarized by Gee (2007):

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. (p. 43)

This sense of constructing cultural knowledge based on diverse perspectives aligns with Gee’s (2007) perspective on how boys engage in the social activity of playing video games. Boys playing video games online or with more than one player are building a collaborative networked community with other peers and learners, and thus demonstrating the social and cognitive learning aspects through play and potentially exploring literacy connections (see for example, Alexander, 2009; Huizenga et al., 2009). This social perspective was also shared by Steinkuehler, Squire, and Barab (2012), who argued that “consistent with the sociocultural approach, it is equally important for researchers and theorists to understand the socially situated nature of game play” (p. 10). Furthermore, I suggest that narrative elements in video games are forms of storytelling (such as in *Never Alone (Kisima Innitchuna)*) which help to connect multiliteracies skills, literacy, and video game play. Based on Vygotsky’s (1978) theory of children actively engaged in oral discussions, Steinkuehler (2007) reiterated that games embed “orally delivered” narratives that represent “another form of reading and writing” (p. 193).

With the idea in mind that games embed narratives, Steinkuehler, Squire, and Barab (2012), also expressed that games connect to literacy through the learning experience of playing the game: “a good game can teach you how to play it through the very act of playing it. And players can develop a literacy of games as they learn through the playing

of a variety of games” (p. 75). Those underlying literacy skills can be associated with the ways players develop strategies to warn other players of impending threats, and collaborate by exchanging information and knowledge in online communities of practice, such as online chat rooms (Alexander, 2009). When players play together they can exchange ideas of gameplay, which is also echoed by Steinkuehler et al. (2012) who note that “as participants play together and are exposed to one another’s thinking, particular players become recognized as experts” (p. 16). This idea that boys can create cultural knowledge through social engagement, exchanging ideas, knowledge, and stories, is further illustrated through my narrative of their voices within Chapter 4.

2.8.3 Video games in classroom replacing traditional texts.

Emerging research has the potential to inform secondary school English teachers regarding how to engage and motivate their students in multiliteracies. A recent study was conducted by Duret and Pons (2016) who provided grade ten high school students with the opportunity to engage with video games in the place of “traditional texts such as Shakespeare’s *Macbeth* and George Orwell’s *1984*” (p. 121). The video games were chosen by the teacher to represent contemporary genres and sufficient complexity within the storyline. Duret and Pons (2016) found that students demonstrated competencies in navigating “the medium of video games and [made] significant intertextual connections using games as a source text. The majority of the students reported the unit of instruction as a great learning experience that connected to them meaningfully” (p. 124). Ways of reshaping literacy practices are fundamental to the Designing and Redesigning found in meaning-making (Cope & Kalantzis, 2009; The New London Group, 1996). Games such as *Minecraft* (see diagram of video games in section 4.4) promote meaning-making as redesigning processes based on a game platform that invites players to develop skills in designing simulated real life logic (Kafai, Burke, & Steinkuehler, 2016). Despite the active learning outcomes that emerged from this study, Duret and Pons (2016) recognized that teachers are reluctant to implement video gaming pedagogy because they regard video games as “frivolous pursuits that often promote violent or misogynist values” (p. 121). Furthermore, learning opportunities with video games have also been explored across the curriculum, for example, in math and science.

2.8.4 Video games across the curriculum.

Lopez-Morteo and Lopez's (2007) study focused on improving learning through an "electronic collaborative learning environment based on interactive instructors of recreational mathematics (IIRM), thus establishing an alternative approach for motivating students towards mathematics" (p. 618). They used an online collaborative environment combined with support elements to bridge content and context for the learning experience. The study had positive results as students were more motivated and excited to learn math when using computer games; however, some negative results included issues with computer failures. Researchers indicated that online collaborative games promoted greater interaction among students, even though students preferred to play games that did not support online interaction. Additionally, results showed students found usefulness of math in daily life, which increased their level of confidence and attitudes towards learning math. An issue with this study is that it did not contribute to the current field of literature for high school students who could use computer games to improve literacy, as it focused on elementary students learning math skills.

Kim and Chang (2010) also researched the use of computer games to enhance learning, and revealed a similar gap. Their study also focused on elementary students' engagement with mathematics. They acknowledged other gaps as well, identifying the lack of research examining the effects of character gender choices within computer games. They also note the lack of empirical studies examining the "effect of computer games on the academic performance of diverse learners" (p. 224).

Vogel et al. (2006) conducted a meta-analysis of gender and use of video games for potential learning, and found that no significant differences were apparent when comparing males to females. Interestingly, in relation to other scholars focusing on the collaborative aspects of video games (Alexander, 2009; Apperley & Beavis, 2011; Huizenga et al., 2009; Sanford & Madill, 2006), similarities were found from Vogel et al.'s (2006) analysis revealing significant results for cognitive gains from playing the video game. What the study by Vogel et al. (2006) also revealed was that "females showed significant cognitive gains favouring the interactive simulation and game method" (p. 234). Since these studies focused on elementary students and mathematics,

there is still a need to explore the use of computer games, specifically focusing on boys, at the high school level. Recent research is also emerging supporting integration of science, technology, engineering, and mathematics (STEM) concepts in digital games (Decoito & Richardson, 2016). A study by Decoito and Richardson (2016) focused on introducing digital games as a pedagogical tool for K-12 science teacher candidates at a Canadian university. The participants explored the use of video games (for example, an online game, *History of Biology*) for teaching STEM concepts, and Decoito and Richardson (2016) found that teacher candidates expressed an “overwhelming agreement for including digital online games in science teaching” (p. 10). The participants also expressed the importance of using digital online games for science teaching for “engagement, relevance, reinforcement of content areas, and promoting 21st century skills” (p. 10). Decoito and Richardson (2016) also recognized some concerns surrounding learners’ lack of expertise in the game, as well as technical challenges which posed frustration when completing the game.

2.9 Transitioning literacy practices

2.9.1 Video game literacy limitations.

Within the literature, we need to reassess the popular assumption diminishing literacy content found in video games since recent studies have shown the contrary, as discussed earlier in this chapter. Gros (2007) recognized that there might be some potential for learning. Other recent scholarly literature identified challenges in the complexity of video gaming, which could downplay the value for teaching literacy. Another point raised by scholars dealt with a potential for gaining in-school literacy skills from playing video games; however, this perspective is beginning to change with Cope and Kalantzis’ (2009) pedagogy suggesting that Experiencing includes in-school and out-of-school experiences of meaning-makers. Further complexities exist around video games as a primary resource for educators, due to the highly stereotypical content (for examples, refer to Sanford & Madill, 2006; Steinkuehler, 2010). Gros (2007) claimed “the content of a game can produce a simplification of reality ... based on violent and misogynistic themes ... many critics suggest that what people learn from playing video games is not always desirable” (p. 23). I would argue that research has not concentrated on empirical evidence

surrounding how boys may respond socially and culturally to video game content as they approach their learning.

2.9.2 Conflicting evidence: Academic versus social.

Some research revealed video games contain embedded literacy content (see for example, Ajayi, 2011; Akkerman et al, 2009; Alexander, 2009; Apperley & Beavis, 2011; Foster, 2009; Gee, 2003, 2007, 2009; Gros, 2007); however, most of the literature has not yet explored the distinction between meaning-making through video gaming practices with relation to the multimodal framework and pedagogical perspective (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012; The New London Group, 1996). Nor has it explored how youth develop meaning-making from playing video games or even thoughtfully transfer it to in-school literacy practices. Gros (2007) commented, “there is no research that actually documents a link between video game playing, attention skills, and success in academic performance or specific occupations” (p. 30). Similar to Gee (2007), Alexander (2009) stated that “many games are also collaborative in nature, they provide an opportunity to see such literacies in evolving communal contexts” (p. 37). Gee (2007) emphasized that “whether they play alone or together, the enterprise is social since almost all players need to get and share information about the games in order to become adept at playing them” (pp. 91-92).

People connecting in game play are part of a socio-material epistemology (Fenwick & Edwards, 2013) where surrounding networks (online gaming community forums) and objects (computers) help learners construct meaning when they interact with them. Alexander (2009) recognized how players use surrounding networks, noting that “some gamers are actively engaged in developing high-level literacy skills such as literacy reflectivity, trans-literacy connections, collaborative writing, multicultural literacy awareness, and critical literacy development” (p. 37). Thus learners react cognitively to video game play. The question remains as to whether students actively understand or even identify with the rich literacy skills embedded in these video games. Alexander (2009) recommended an alternative to bridge this transition and suggested that teachers build video game literacy development by integrating video game play in the media sections for composition curriculum. Similarly, Ajayi (2011) recognized literacy

pedagogy lacking in the use of multimodal resources to support diverse learners' abilities to interpret different types of texts in multiethnic classrooms. As outlined in Chapter 1, teaching strategies based on the media literacy sections of the curriculum relate to critical pedagogy. The purpose of media literacy is to develop student awareness of the influences of video games on social behaviors, rather than using the video games for meaning-making, such as metacognition.

2.9.3 Transitioning from outside video gaming to in-school literacy.

One question remains: how can teachers bridge out-of-school video gaming practices to in-school literacy? One way to address the literacy gap, according to one scholar, is by introducing texts that have associated content. Kristie (2008) suggested that "struggling readers may still need scaffolding as they move from dynamic visual format found in video games to the static print format found in books" (p. 84). The argument here appeared to view video game play differently from text and/or reading comprehension, which suggests that video games lack literacy elements. Therefore, using print text formats for literacy is a separate activity and is not interrelated or connected with digital text formats. Using traditional print text formats for literacy is contrary to the socio-material epistemology explained by Fenwick and Edwards (2013). This point was also challenged by Alexander (2009), who emphasized that "it may be the case that printed text is no longer a dominant form of literacy, but the text that appears on screen and on websites seems just as significant as the visuals and icons involved" (p. 44). Alexander (2009) reinforced this digitized learning concept when he suggested that that "students deploy Gee's 'multiple routes' and 'intertextual' principles, in which gamers understand that multiple texts and genres of texts must be used and manipulated to achieve their ends" (p. 43). In Van Sledright's (2002) study investigating reflexive and intertextual skills, it was noted that students, in their knowledge construction, used these skills to validate, interpret, and judge various historical artifacts by engaging in intertextuality, which draws attention to how meanings are established through relationships with other texts (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012; The New London Group, 1996). As students adopt a modified approach to content analysis, Van Sledright (2002) emphasized that it is important to define categories inductively by reading the texts

reflexively. Some would argue that video game practices do not enhance reading comprehension for some struggling readers.

I disagree with the assumptions of some of these scholars (Kristie, 2008; Prensky, 2001) since recent research has shown that struggling readers can gain literacy practices from outside interests in video games. Steinkuehler's (2010) study highlighted one student, Julio (pseudonym), who showed no actual performance improvement and suggested that the video game play was disruptive to Julio's in-school literary experience because he refused to finish any assigned readings in class. Steinkuehler asserted that,

Julio's entire out-of-school literate life was wholly organized around these interests: He would check facts for his novels using online texts ... play games related to time periods and narratives ... and share these materials and practices with his immediate peers. (p. 62)

Findings by Steinkuehler (2010) indicated that Julio, a video gamer, loved everything about World War II including being an avid reader and writer of fan fiction, and due to this, he was an authority in his peer group. Therefore, it is possible that video games with literacy content can potentially represent an alternative classroom strategy.

2.9.4 Pre-1990 games associated with narrative elements and books.

There are many ways for educators to think about approaching literacy learning. One is to think about video games as an alternative classroom strategy for literacy learning, which is not a new concept. Video games are a viable alternative classroom strategy for literacy learning because video games contain storylines and literacy features. Although I only introduce a sample range in this section, these types of games have existed for more than 40 years, and include a range of interactive, role-playing adventures. Some of these interactive, role-playing games include Dungeons and Dragons (Gygax & Arneson, 1974), the Colossal Cave Adventures (Crowther & Woods, 1977).

The Colossal Cave Adventures game, in particular, was the first video game to include higher literacy content. The game Adventure was introduced from 1975 to 1977 (Crowther & Woods, 1977) and was followed by Zork (Infocom, 1979). Following these

games, a few years later, the game *Bard's Tale* (Interplay Productions, 1985), was created and the game *Suspended* (Infocom, 1983). *Bard's Tale*, similar to the *Dungeons and Dragons* design, was designed 11 years later as a highly integrated fantasy role-play game with a 3-D graphic interface. In contrast, a complex game called *Suspended* (Infocom, 1983) relied on a combination of the player's perception (such as sight, hearing and information memory) and ability to problem solve in order to save the planet.

Furthermore, the game called *Zork* (Infocom, 1979) "distinguished itself in its genre as an especially rich game, in terms of both the quality of the storytelling and the sophistication of its 'text parser.'" This game by Infocom (1979) was not limited to "simple verb-noun commands ('hit troll'), but recognized some prepositions and conjunctions ('hit the troll with the Elvish sword')". It also encompassed all the elements of a narrative including a setting, detailed plot, and characters. It was the first detailed, interactive video game designed in the 1970s, whereby the players needed to discover treasure and adventure. This game was later developed into a series of books, which emphasized the narrative and literacy potential embedded in these types of video games. Interestingly, boys who play these types of narrative games outside of school could be gaining literacy skills (Sanford & Madill, 2007).

2.9.5 The gap in literature: Meta-analysis conducted for video gaming studies.

Sanford and Madill (2007) also recognized how out-of-school activities and in-school literacy practices differed, by arguing that "clearly a disconnect occurs between school literacy practices and those that our male participants practice out of school" (p. 435). There are broad debates and existing gaps in the literature about boys' video gaming practices as having potential for meaning-making, cultural knowledge development (see definition of terms in section 1.7), and in-school literacy practices (see for example, Akkerman et al., 2009; Apperley & Beavis, 2011; Gros, 2007; Hommel, 2010; Huizenga, Admiraal, Akkerman, & Dam, 2009; Ke, 2008; Kristie, 2008; Newkirk, 2002).

One researcher, Ke (2008), found in a meta-analysis of gaming studies conducted by other scholars, such as Randel, Morris, Wetzel and Whitehall (1992) and Vogel et al. (2006) that "a few current researchers shy away from drill and practice games and have

claimed them as not equally effective in improving learning and skills in comparison to other game genres” (p. 1610). These studies demonstrated how video games were used as a method to test facts, rather than to foster creativity and learning, revealing a gap in literature and institutional practice. Apperley and Beavis (2013) did emphasize that out-of-school literacies explored the players’ knowledge about “games, the world around the game, ‘me’ as a game player [and] learning through games” (p. 5). These claims suggest that scholars have also debated whether video gaming would be a possible strategy for developing multiliteracies skills while addressing literacy practices in school. Certainly, Kalantzis and Cope (2012) also recognized that out-of-school experiences can affect learners’ meaning-making. Moreover, Sanford and Madill (2007) conducted interviews with boys and found that “teachers do not understand or ignore many of their literacy practices as teachers address curriculum demands” (p. 435). This position is reinforced in other studies:

- (a) Computer games have been used in education primarily as tools for supporting drill and practice, yet limited research has been done on the effectiveness of these games;
- (b) in comparison with simulation games, drill and practice games are easier to be introduced in a classroom and integrated into a current traditional curriculum. (as cited in Ke, 2008, p. 1610)

Similarly, Apperley and Beavis (2011) claimed a gap in the literature to link video gaming with multiliteracies, when they suggested that “this is an area that requires further investigation by scholars interested in using digital games to support students in developing traditional literacies, multiliteracies and the peculiar literacies of action involved in digital game play” (p. 134).

Some scholars have noted that using alternative sources, such as video gaming, as a means to inform us about boys’ literacy practices, is absent in the curriculum guide (Ke, 2008) and perhaps also in pedagogical practices. Ke (2008) conducted a review of game-based learning research and found “that most gaming studies focus on *learning conceptually*... like general reasoning, creativity, system understanding and decision-making, which does not demand special knowledge of subject areas. Many current games

used for facilitating learning lack connection to curricula in school” (p. 1610). Moreover, scholars such as Baek (2008), Kirriemuir and McFarlane (2003), and Rice (2007) reflected on ways that video gaming could be applied to a multimodal framework and multiliteracies pedagogy (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012; The New London Group, 1996) as an alternative approach to improve in-school literacy practices of boys, who are actively engaged in gaming. They also acknowledged barriers such as the quality of video game content for curriculum use. Some educators resisted utilizing video games in the classroom, perhaps due to their lack of computer or video game technical knowledge, restrictions in curriculum or lack of time (see for example, Baek, 2008; Gros, 2007; Kirriemuir & McFarlane, 2003; Rice, 2007). To address these concerns about the boys’ literacy gap, these types of alternatives are available, and familiar, noted Newkirk (2002), who suggested, “that a culture produces a broad range of narrative forms. These forms may be written, oral, visual, musical, or some combination of the four, and can include web pages, rock videos, television shows, cartoons” (p. 11). Given these comments, some limited resources are beginning to surface that support alternative approaches to engage boys in literacy practices, such as using music (Stahl & Dale, 2012) or sports/adventure related reading materials (Smith, 2004); however, these were not related to video gaming specifically. Gee (2007) explained the importance of providing players with the ability to drive their own learning, and video games support active learning processes because “video games are interactive. The player does something and the game does something that encourages the player to act again” (pp. 30-31). To support this notion, Mifsud, Vella, and Camilleri (2013) recently conducted a large-scale study in Malta, which consisted of over 1000 students, between eleven and sixteen years old. The study included 464 boys, 699 girls and 149 teachers (47 male and 102 female), in addition to 783 parents. Although this study focused on learning English as a second language, it also examined attitudes toward the effects and uses of video games for literacy attainment in school. Mifsud et al. (2013) found that 79% of the students identified video games as a means for learning. The study found no significant pre-test differences, which according to Mifsud et al. (2013), implied that “both groups started off with a similar level of ability” (p. 43). The most significant difference occurred in the post-test results, which revealed that,

Performance was attained by the experimental group, but not by the control group ... This shows clearly that the pupils who had played the video game as part of the programme of English lessons ... made significant gains in learning when compared to the control group which had regular English lessons throughout. (p. 43)

In addition, Mifsud et al. (2013) also argued that students are “gradually migrating away from traditional reading and writing as they are increasingly exposed to digital literacies, which require different cognitive and learning skills” (p. 48). This interactive learning is akin to a student-centred classroom environment, where students are actively learning, and have the potential to bridge their out of school video gaming activities skills with developing meaning-making for knowledge and in-school literacy practices.

2.10 Government-led strategies

The Ontario government's Ministry of Education (OME) drafted several policies, digital work sites and instructional strategy guides for teachers in response to the growing trend of boys' underachievement, as evidenced in Programme for International Student Assessment (PISA), Ontario Education Quality and Accountability Office (EQAO) and Ontario Secondary School Literacy Test results (OSSLT). For the context of my research, I only focused on two of these guides developed by the OME to address boys' underachievement: the first guide, *Me Read? No Way! A Practical Guide to Improving Boys' Literacy Skills* (2004), which attempted to identify specific types of reading genres that may be of interest to boys; and the second guide, *Me Read? And How! Ontario Teacher's Report on How to Improve Boys' Literacy Skills* (2009). These strategy guides followed a similar theme to their 2004 publication, which promoted strategies to identify boys' traits and learning abilities. These strategy guides have been rigorously challenged by several scholars who call into question the absence of gender and have been labelled in the field as “boy friendly” (Frank, Kehler, Lovell & Davison, 2003; Greig, 2003; Kehler, 2007, 2011; Lingard, Martino & Mills, 2009; Lingard, Martino, Mills & Bahr, 2002). I have still chosen to use these policy guides as a starting point for my exploration of some boys' meaning-making and cultural knowledge (see definition of terms in section 1.7).

One of the key strategies from *Me Read? No Way! A Practical Guide to Improving Boys' Literacy Skills* that I focused on was “Get the Net: Using technology to get boys interested in literacy” (p. 40), because it related to the context of my research problem. The guide also referred to using computers and multimedia to harness boys’ “attraction and stimulate their literacy development” (Ontario Ministry of Education, 2004, p. 46). Best practices are also highlighted in the guide and these practices focus on visual (p. 10) aspects of the multimedia experience, which may help to explain the visual-spatial learning abilities used by some boys (Blum, 1997; Eliot, 2009; Gurian & Stevens, 2010a, 2010b; Sax, 2005; Schroeder & Kuriansky, 2009). The second guide included a number of best practices and strategy recommendations. My focus included “non-traditional text forms such as magazines, newspapers, comic books, graphic novels ... websites and other digital texts” (p. 9); “use a variety of active learning experiences, such as competitions, games” (p. 20); “use visual tools” (p. 26); and “use a variety of software programs ... visual learning software ... Create venues for computers and gaming activities in the school” (p. 52).

What we can glean from these OME (2004, 2009) guides are strategies suggesting harnessing boys’ interest in computers, specifically gaming, in order to motivate them towards various learning processes. To illustrate these learning initiatives within the guides, personal narratives are offered from some school principals who attempted to increase awareness about student benefits from playing video games, and establishing gaming centres in the school (Ontario Ministry of Education, 2009, p. 54). Other points in the OME’s guide (2009) highlight boys as visual-spatial learners and call attention to the multiliteracies multimodal model of design representations (audio, visual, and gestural). The OME (2009), also cited field scholars such as Smith and Wilhelm (2002) who indicated that a variety of texts should be considered as best practices. They explained to provide “boys with texts that: are ‘storied’, using a narrative approach that focuses more on plot and action than on description; are visual ... providing a multimedia experience” (p. 10). Further to the notion of considering a variety of texts for boys, were the recent EQAO (2014) results that recommended ways to increase boys’ multiliteracies development by offering a variety of resources to include digital formats. For me to make sense of these government-led strategies, I needed to first understand the basis of their

perspective; therefore, I want to briefly highlight where boys' literacy underachievement fits within global and Canadian literacy indicators.

2.10.1 Qualifying the gap.

The literacy practices referred to in my study can be associated with the definitions outlined by the Canadian Literacy Agency (EQAQO, 2014). EQAQO provides guidance for the OSSLT, which assesses literacy achievement for Grade 10 high school students. EQAQO administers the OSSLT annually in spring in each high school across Ontario, and to assist students to prepare for this standardized test, EQAQO provides guidelines for teachers. The purpose of the Planning and Preparation Guide (EQAQO, 2014), is to describe two main literacy goals of the OSSLT: reading and writing. As a systemic guide, I use the multimodal conceptual framework of multiliteracies meaning-making, set out by The New London Group (1996) and Cope and Kalantzis (2009) as a starting point. I argue that this theory supports my aim to contribute to literature through suggesting modification of the multiliteracies theoretical framework based on my research findings. My thesis focuses on multiliteracies skills development and considers literacy skills which policy guides highlight as a reader who makes meaning of a variety of written texts (EQAQO, 2014). Multiliteracies theory further describes literacy as making connections between ideas in a reading selection and the individual's personal experiences (EQAQO, 2014). Within the same guide, the writing component indicates certain expectations for Grade 10 students, which focus on three literacy-related skills: developing a main idea with supporting details, coherently organizing the writing, and using clear concise language (EQAQO, 2014). The guide does not dictate one particular source, such as books, for teachers to use to assist students in ways to gain literacy skills, but rather suggests alternative tools for teachers to use such as “informational, narrative and graphic” (p. 3).

2.10.2 Video games and new technologies for the 21st century classroom.

There is growing evidence of the OME implementing new technologies and video games in classrooms to support literacy for 21st century learners. As a way of responding to the multimodal needs of learners, the OME has recognized evolving paradigms and

pedagogies for literacy learning and teaching. In their literacy policy guide *Paying Attention to Literacy* (2013), they recognized the need to support all learners in exploring and making sense of a multimodal, multimedia world, by using a wide variety of texts and technologies. They recognize how multimodal, digitally rich texts can provide complex learning opportunities and foster collaborative learning communities that are relevant and engaging to learners.

Reading is considered a main indicator for literacy yet some educators and scholars found that traditional print strategies for teaching spelling and vocabulary have failed to engage learners. A recent OME strategy guide, *Using Digital Technologies to Support Word Study Instruction* (Scott, 2014) advised that digital technologies, including games, are considered another way to address multimodal representations (visual, audio, and tactile) to help learners make meanings. Using these technologies in the classroom can provide opportunities for individual learning or small group collaboration. Learners control their own learning pace and difficulty. These alternative multimodal texts and games offer variety and challenge for the learners, and continuous assessment.

Moreover, the OME recognizes video games in the classroom for building literacy and numeracy skills. In one of the OME's strategic guides called *Video Games in the Classroom* (Dupl  a & Shirmohammadi, 2010), they suggest there is no research to support that video gaming is addictive and leads to violence, and that behavioural problems are rooted elsewhere (Ferguson & Kilburn, 2009; Sherry, 2001). Dupl  a and Shirmohammadi (2010) suggested that video games support experiential learning because learners actively construct meanings as they manipulate objects and variables and engage with the game's semiotic systems (visuals, sound, text, etc.). Many video games involve features that support learning, such as "pleasure, interactivity, problem-solving and creativity" (p. 1). They also suggested that many of these games offer opportunities for learners to collaborate and develop their social identities. Furthermore, another one of OME's strategic guides called *Literacy for a Connected World* (2015), suggested that learners need to integrate knowledge from multiple sources, including video and other media, to be successful. More importantly, they suggested that using technology enhances student learning. They also recommended that learners can develop thinking

strategies and solve problems by participating collaboratively in online communities of practice.

2.11 Summary of gaps and future paths

This literature review revealed a number of gaps. One of the major gaps revealed is that when adolescent boys engage with video games, they respond to video game content differently to gain potential literacy skills and socially constructed cultural knowledge (see definition of terms in section 1.7). Based on the idea that boys may respond differently to video game content, I conducted my study to further probe the intersection of these three areas of inquiry (video gaming, multiliteracies, and cultural knowledge). Scholars, such as Hommel (2010), recognized this literature shortfall by suggesting that youth could learn by using video games, but that this has not yet occurred in schools as a pedagogical tool for implementing the curriculum. Meaningful learning in video game play is highlighted by researchers to include complex literacy skills such as critical thinking, problem-solving, and intertextuality (Apperley & Beavis, 2011; Beavis, Muspratt, & Thompson, 2015; DeCoito & Richardson, 2016; Duret & Pons, 2016; Gee, 2014; Hommel, 2010; Sanford & Madill, 2007). Gee (2003), and Squire (2013), both claimed that literacy content exists in video games. More importantly, Cope and Kalantzis (2009) recognized the importance of meaning-makers experiencing new knowledge inside and outside of school. Sanford and Madill (2006) recognized participants in their study who played video games exhibited an increased capacity for learning.

Huizenga et al. (2009), Apperley and Beavis (2011), and Sanford and Madill (2006) highlighted that boys' use of video games might change their perception of patriarchal hierarchies and cause them to resist social norms. Duret and Pons (2016) also remarked on the slow acceptance of video gaming for pedagogical alternatives due to teacher reluctance and concern over video game content. Steinkuehler (2010) noted in her study some limitations to using video gaming as a pedagogical tool for boys may occur due to increased engagement in and out of school. Findings indicated limitations in actual literacy performance; however, this out-of-school practice involved novel reading and writing, which provided Julio (the participant) with stronger literacy skills over his peers.

A gap exists with the study conducted by Chandler-Olcott and Mahar (2003), because it focused on elementary-aged children as compared with adolescents. Furthermore, their analysis of the findings were based on the earlier version of the multiliteracies framework and pedagogy (The New London Group, 1996), and not the reconfigured framework in 2009 which may have impacted the significance of the findings.

Sanford and Madill (2006), Gros (2007), and Steinkuehler (2010) explained themes of risk that boys will develop patriarchal values due to stereotypical themes embedded in video game plots and characters, thus downplaying any literacy value attached to video game activity. These perspectives suggest that boys are homogeneous (Connell, 1996), when in fact, they can construct different masculinities (Kaufman, as stated in Brod & Kaufman, 1994). Another gap was recognized by Sanford and Madill (2006), who found players focusing on competitive aspects of video games rather than reflective practices. Thus, they also dismissed any literacy content value.

Other themes included how video games has the potential for increasing culturally meaningful literacy activity (Ajayi, 2011; Gee, 2003, 2007, 2014). The interplay of literacy components (such as paratexts, intertextual elements, social-cultural relationship building, motivation and critical learning paths) was evident through the review of the scholarly literature.

Although I agree with the findings of the Steinkuehler and King's (2009) study up to a point, the methods may have influenced participants in the study. Namely, the educational institution where the study was located differed from the academic environment an adolescent would normally experience. Additionally, the gaming environment simulated the feeling of a controlled laboratory experiment within a regulated institutional environment, such as a university. This setting likely emphasized expectations to perform well. In addition, a university laboratory may have impeded their normal behaviors as adolescents. It may be advantageous, in my study, to observe adolescent boys adolescents in a natural non-institutional environment to understand their knowledge processes. Moreover, the study prescribed the game used thus limiting choices of games the participants could use. This limitation may have impacted boys'

meaning making processes, identity constructions and behaviors based on what games they chose to play and how they responded to those games.

Within the literature there are many contradictions and lack of empirical research regarding the perception of boys and their potential transference of critical literacy skills to the in-school practice. Therefore, future studies are required to investigate levels of content literacy of video games and boys' perception of how to use these skills to improve their literacy development for in-school practice. Because multiple masculinities presents a broad range of complexities in and of itself, and some of the boys in my study expressed different identities, I have planned a future study to explore this phenomena further. Although some of the boys in my study showed minor tendencies to explore gender and multiple masculinities, due to the complexity of this domain of research, a future study is planned in which I would draw specifically upon a multiple masculinities lens to make sense of the ways in which the boys constructed their gender while engaging in video gaming practices. Similarly, a gap exists in Dietz's (1998) study because no adolescent boys were identified as participants to express their masculinity in multiple ways through their character choices.

2.11.1 Literature shortcomings.

Literature shortcomings exist about our understanding of how boys' video gaming practices may contribute to their multiliteracies skills and cultural knowledge. I highlighted these literature shortcomings through critical analysis, which helps to frame my argument and exploration. Using multiliteracies, video gaming technology, and social cognitive lenses, I examined the literature gaps, outlined in the following sections, to support boys' cultural meaning-making. In particular, Apperley and Beavis (2011) also found gaps in existing literature, which linked multiliteracies and digital games to students' meaning-making. As much as the gap between video games and learning is recognized in literature, complexities surrounding boys' identity constructions, when playing certain video games, has remained at the forefront.

Chapter 3

3 Methodology

The meaning-maker as designer draws selectively from the infinite breadth and complexity of Available Designs in the main domains of action and representation that make up the layers of their past and new experience. This representation is an expression of an individual's identity at the unique junction of intersecting lines of social and cultural experience. (Cope & Kalantzis, 2009, p. 11)

3.1 Chapter overview

My methodological decision for my research was to use two ethnographic cases. The term methodology represents “understanding the social organizational context, philosophical assumptions, ethical principles, and political issues of the enterprise of social researchers who use methods” (Neuman, 2006, p. 2). The appropriate choice for this study was two ethnographic cases to maintain a qualitative approach that focused on the naturalistic aspects of inquiry. This choice also made sense to me because I knew I wanted to observe and understand how adolescent boys' video gaming practices shaped their cultural spaces and contextual experiences. Furthermore, as a constructivist, two ethnographic cases allowed me to explore the socio-cultural experience of individuals. Additionally, my research decisions influenced my research paradigm. My ontological approach is relativism, relating to people having different perspectives about reality, reinforced by my constructivist/interpretivist perspective that knowledge is transformative in nature. This paradigm shapes my epistemological framework.

Because of the highly digitized properties of video gaming technology, I relied most heavily on multiliteracies theory for my analytical strategy. Therefore, in this chapter, I describe the multiliteracies (Cope & Kalantzis, 2009; The New London Group, 1996) meaning-making systems, representing my theoretical framework. I provide details about the methods I used to recruit adolescent aged participants and to choose multi-site settings to conduct my fieldwork observations. I also include the steps that I took for collecting my data, including observations at two sites and interviews with each

participant. I then explain how I interpreted my data through ethnographic, analytical processes. These processes related to cultural meaning-making systems and involved both domain taxonomies and the multiliteracies multimodal framework and pedagogy as analytical tools (Cope & Kalantzis, 2009; The New London Group, 1996, 2000). Finally, I briefly outline methodological and ethical considerations that built reliability, trustworthiness and transferability of the data.

3.1.1 Constructivist viewpoint: Natural observations.

From a constructivist stance, the individuals who interact with each other and how they inform their decisions in the world, subjectively and dynamically shape reality.

Therefore, I elected to study my participants in their natural surroundings, which included a community centre and an after-school video club, instead of an institutional arena, such as a school. An advantage of observing individuals in their natural settings is that it allows the researcher to observe those individuals interacting with others as they develop their cultural meanings (Patton, 2002). This definition helps to frame this chapter because it not only reinforces my onto-epistemological stance, but also puts emphasis on how a qualitative case study researcher acts as a receptive inquirer, allowing the boys' voices and actions to illuminate the exploration. This supports my aim to hear the boys' voices (Weedon, 1987) and their understanding of their own distinct experiences (Stake, 2006).

It is also important to recognize how everyday experiences constructed and dynamically shaped individuals' interactions with each other. This social aspect of constructivism presents itself in how children learn from each other through language, symbols, and situated practices (Vygotsky, 1978). Underpinning multiliteracies theory are everyday experiences of meaning-making as a form of socially and culturally constructed designs (Kalantzis & Cope, 2012). These designs represent dynamic transformations of knowledge processes and discourses for active citizenship, centred on learners as agents in their own knowledge processes contributing and negotiating differences in society (Cope & Kalantzis, 2009). Therefore, some cultural practices are influenced by multiliteracies' theory which is underpinned by contemporary modes of multimodal meanings, including linguistic, visual, audio, gestural and spatial.

3.2 Methodology: Two ethnographic cases

I employed a qualitative ethnographic case study design to understand the contextual experiences of four boys who participated in my study. I specifically wanted to understand the uniqueness of the boys' individual experiences occurring within particular settings where the boys constructed and shared cultural meanings (Stake, 2006). Ideas or images come to mind about culture when we think of ethnography conducted in natural settings and the way people live in a society. Therefore, I needed to develop thick descriptions (Geertz, 1973) to achieve this aim of understanding the role of culture in the boys' lives and experiences. The reasons for building these descriptions were first, to familiarize myself with the setting thoroughly, and second, to better understand the foundation of the boys' cultural meanings, within their contextual experiences.

3.2.1 What is ethnography?

Ethnography is a research design that researchers adopt to study an aspect of everyday life. One of the aims of ethnography is cultural interpretation. Therefore, the ethnographic researcher draws upon ethnographic tools to produce detailed descriptions of events witnessed over time. In the processes of doing ethnography, the researcher produces analytic representations of cultural understandings from the data, in an effort to present emic (insider) perspectives. Geertz' (1973) definition of ethnography and of culture as a system of meanings is a better fit than Stake's (2006) definition for research about boys' experiences as they play video games and shape cultural meanings in different contexts.

Denzin and Lincoln (2011) viewed ethnography as an inquiry-based qualitative research approach, where researchers write "tiny moral tales, that do more than celebrate cultural difference or bring another culture alive" (p. xiii). Ethnography aims to understand specific human experiences, both historical and political, based on information that can take both written and visual forms (Tedlock, 2000). Tedlock (2000) clarified for me that a researcher is influenced by their ontology and epistemology and has reflected on their own personal experiences, which is what led them to the research in the first place. Researchers need to be reflective, when applying an ethnographic methodology, as they learn about other people's experiences and report on them (Tedlock, 2000).

Ethnographers are often referred to as interpretive social scientists, who search for underlying contextual facts within a meaning system, that are dependent on peoples' particular experiences and settings (Neuman, 2006). LeCompte and Schensul (1999) outline characteristics of ethnographic studies for human research based on a culture concept. To focus on relationships built between researchers and participants, ethics, and a belief that reality is contextual, they used participant meanings to organize their research. Their definition of ethnography also reflects a theoretical focus on culture and a way to organize results (pp. 3-4). Patton (2002) referred to the dual perspective of ethnography. Taken from its origin, the "emic" aspect of ethnography represents how we as researchers can "come to share a set of understandings with the people" we study (Goodenough, 1970, p. 112 as cited in Patton, 2002). Patton (2002) also used Goodenough's definition for the "etic" concept as a "tool for describing and comparing cultural forms" that "provides the materials from which various typologies of cultural forms can be constructed for specific investigative purposes" (p. 129). Based on the individuals studied, the participants or informants, Patton (2002) described how a researcher's perspective involves a dual role, both as an outsider (etic) and an insider's (emic) perspective. As my ontological and epistemological view is grounded in relativism, in my view, it made sense to accept this definition as a dual role. I was still an outsider. I neither was a boy, a video gamer, nor of this age demographic. I felt it was just as important to me as a researcher using both an emic and etic perspective to interact with the data and participants. It made sense for me to use a method using a dual reality based on an emic/etic perspective.

3.2.2 Ethnography in educational settings.

Wolcott's (1987) and other theorists' views on ethnography in educational settings come to mind when I think about ways to understand boys in their cultural meaning-making systems. What makes this type of ethnography different is that it generally focuses on the principals, the teachers, or the students, in terms of curriculum practices, behavioral systems or culture-sharing groups such as gender-based groups. How is ethnography applied in education? Historically speaking, ethnographic research has typically focused on cultural or societal settings, not education. Wolcott (1987) introduced a new set of methods as part of an educational research process. He suggested that researchers could

rely on descriptions for everyday life in school settings in order to understand the culture. Therefore, ethnographers in educational settings need to be aware of cultural meanings implied by participants. These implied meanings are not always directly observable, but researchers can draw understandings about those cultural meanings by the way the participants make connections between those meanings and their experiences.

According to well-known anthropologist David Fetterman (1989), there had been a flood of research into classroom behaviors, classroom dynamics, interactions between curriculum and students learning culture or meaning systems. Fetterman (1989) highlighted how researchers claim authority as ethnographers even though they only spend time in the field once a week over a four-month period. He argued that most of this research was non-scientific with minimal specific tools or understanding of anthropological guidance. Yin (2014) echoed this stance and more severely debated the merit of exploratory ethnographic research as representing a contribution only as pilot studies rather than value in contributing to evidence-based research.

Other prominent scholars (for example, Guba & Lincoln, 1994; Wolcott, 1987) argue that ethnographic research in education is both *process* and *product*, defined by Wolcott (1987) as “a picture of the way of life of some identifiable group of people” (p. 156). The ethnographer’s purpose, “is to describe and interpret cultural behavior” (p. 5). Wolcott (1987) also made it clear that it is not possible to conduct ethnographic work over short spans of time, advising researchers to use three basic tenets for ethnography. First, the researcher should rely on descriptions and explanations rather than focusing on specific tools or techniques. Second, culture and cultural meanings are implied assumptions, which do not represent observable phenomena. Finally, drawing conclusions and understandings about cultural meanings is only possible by recognizing how people make connections or associations of those particular cultural meanings within society (Wolcott, 1987). Not surprisingly, Wolcott (1987) strongly opposed the traditional positivist forms of doing educational research, claiming that researchers should not rely on specific methods to authenticate ethnographic research. Rather, “ethnographic significance is derived socially not statistically, from discerning how ordinary people in particular settings make sense of the experience of their everyday lives” (p. 158). Merriam (2009), on the other hand, even though she practices within the scientific discipline, relaxed some

of these strict systematic definitions or characteristics of ethnographic case study research that serve as an umbrella guideline to researchers. She emphasized rich descriptions, naturalistic settings, and defined ethnography as striving “to understand the interaction of individuals not just with others, but also with the culture of the society in which they live” (p. 23), which aligns with the aims of my research.

3.2.3 Ethnographic cases' settings.

My research sought to understand the complexity of boys' use of video games to develop cultural meanings of practice, which would suggest that I needed to observe the boys experiencing the activity “as it occurs in its contexts and in its particular situation” (p. 2, Stake, 2006). From a constructivist/epistemological lens, doing two ethnographic cases allowed for an understanding of individual experiences and cultural meanings constructed by the participants of my study, by encompassing various types of rich, thick descriptions (Geertz, 1973). A number of other practical case study methods exist, (e.g., Merriam, 1998, 2009; Yin, 2014). Each are highly organized and provide researchers with directions on many aspects of their study such as observation, fieldwork, data collection, analysis, and validity criteria. Both Yin and Merriam tended to have roots in a scientific or positivist approach, which is incommensurate with my constructivist stance. I therefore turned to the approaches developed by Geertz (1973, 1987), Stake (1995, 2006), and Wolcott (1987). Patton's (2002) work also offered insight into ethnographic processes and methods.

Both Stake (2006) and Creswell (2007) encouraged the ethnographic process of collecting data in a natural setting and situation, which supports my method. These secondary domains can represent less structured environments, such as a community centre and an after-school video club, than would be found in primary learning domains, such as in school classroom settings. Learning and teaching processes for boys can be experienced in a secondary or less structured domain, which would exist outside of a primary domain where learning would normally be expected to occur (such as a classroom or a textbook) (Gee, 2003, 2007). The reason for this secondary domain choice is that in a classroom setting there may be fewer opportunities for boys to create their own meanings. In a secondary learning domain, boys can choose their own learning

goals by making decisions about how and when they want to play games. Within these secondary learning domains, boys are not as overwhelmed with meeting deadlines. Most importantly, boys can use experiential learning spaces to learn through trial and error processes in order to achieve their chosen goals (Apperley & Beavis, 2011; Gee, 2003; Squire, 2013). Another factor guiding my decision was that schools can represent additional levels of complexity in the forms of authority, classroom rules, peer-based social dynamics, and prescribed curriculum learning outcomes (Connell, 1996; Lingard & Douglas, 1999; Mac an Ghaill, 1994).

3.2.4 Settings: Multi-case ethnographic study.

The aim of an ethnographic multi-case study is to understand the experiences of individuals in their everyday settings. In attempting to interpret meanings that people have about their experiences (Denzin & Lincoln, 2011), researchers conduct ethnographic case research to study people in natural settings. I approached my research using the ethnographic case research method in order to understand how boys develop cultural knowledge (see definition of terms in section 1.7) from their video gaming experiences. I decided to select participants from two different sites to determine if the meanings boys would make differed during my ethnographic multiliteracies meaning-making analysis (Cope & Kalantzis, 2009; The New London Group, 1996, 2000). To understand if the local, natural settings can influence the ways that the boys constructed their cultural patterns, I used rich, thick descriptions to describe these two sites (Geertz, 1973).

Researchers can observe how participants interact with the setting and context (Patton, 2002) through naturalistic observations involving direct and personal contact with participants. To gain a holistic perspective, Patton (2002) emphasized the need for researchers to understand context. For me, Patton's (2002) definition, supported my choice for using ethnography as it gave me the opportunity to observe the boys engaging in their activities in a natural setting. Patton's (2002) views are seemingly unstructured, and a less systematic approach than what I had reviewed from other specific descriptions of conducting ethnographic case study research such as with Yin (2014), and Merriam (2009). I knew that naturalistic observations in different settings were necessary for me to gain a perspective of adolescent aged boys directly. Focusing on adolescent aged boys

with respect to cultural meaning of learned literacies has not been researched previously. Even though Smith and Wilhelm (2002) did conduct a longitudinal study, spending time with boys in a natural setting, their study did not focus on video gaming interests in a secondary learning domain.

Wolcott (1987) advised that both “data and interpretation evolve together, each informing the other” (p. 3). Therefore, the researcher helps to form the interpretive element of the cultural behavior observed, because the researcher is the outsider and contributor to the etic perspective. Cultural behavior consists of two parts, the main culture in society and the micro culture, relating to how people interact with each other (Wolcott, 1987). Ethnography focuses on the completed account of the culture-sharing group, rather than gaining rapport with informants (Wolcott, 1987). The most important message relates to how ethnography functions as a cultural interpretation. A researcher relies on both data and interpretation to inform him or her about cultural practices (Wolcott, 1987). This interpretive element represents the role of the researcher acting as the outsider or having an etic perspective.

Information about culture in ethnography can only emerge through in-depth descriptions, and detailed processes (Creswell, 2009). Geertz (1973) provides a process of situating cultural context in ethnography through thick descriptions. My study revealed that these four adolescent boys had very different experiences as they interacted in two different settings. For Geertz (1973), the context or particularity of a setting informs researchers about human behavior. This interpretive element of cultural behavior represents how people make cultural meanings by seeing things from the actors' point of view (Geertz, 1973). The actors or agents are the fundamental designers of their meaning-making systems (Cope & Kalantzis, 2009). Settings represent where participants' actions take place. These settings also represent the focal point in my analysis and interpretation. Participants interacted with those settings contributing to their cultural meanings.

As an example, Wolcott (1973) based his observations within a principal's office as a contextual setting to conduct his case study. Somehow, this setting, the principal's office, becomes a signifier for participants or individuals occupying the office, parents, visitors and students alike, to construct meanings. These meanings somehow work to transform

those occupants. In this way, when we think of a principal's office, it represents certain symbols or characteristics such as authority, regulation, administration, power, status, consultation, guidance, or organization. Those types of symbols can mean something to the person occupying the office but also those invited into that space. From this idea then, one can imagine that the setting or context interacts with the actor or participant who becomes part of that context and assumes certain expectations, significance, attitudes or meaning in the way they act or are expected to act to support that particular context. Those who enter that office, be they visitors, teachers, or students, associate with those expectations to form understanding or meaning. In Wolcott's (1973) case study, he described that the principal's behavior was influenced by his office setting. A setting can be a contributing factor in a participant's behavior (for example, authority level, status and rules). For the purpose of my study, the settings both contributed to the boys' shared cultural meanings. Wolcott (1973) suggests settings are interactive places where meaning and interaction take place and where discourse takes place among actors, meetings, and activities. Recall that meaning-making is an everyday experience (Cope & Kalantzis, 2009; Kalantzis & Cope, 2012), so setting, place, situation, and interaction with others are all relevant for the agents of that meaning.

3.2.5 Recruitment.

Upon receiving Research Ethics Board (REB) approval (see Appendix G), and two Ontario school board approvals (see Appendix H and I) to conduct research, I began the process of site and participant selection. To build parent trust for consent, the school board's approval was necessary for me to have access to the after-school video club and the community centre.

For both of the natural settings in this study, the emic or insider perspective of these four adolescent participants represented how they interacted within these two particular settings. Gaining entry to the community centre involved a number of gatekeepers or key informants, including the manager, program administrator of the community centre, and the youth activity coordinator. Gatekeepers added credibility and legitimacy to me as a researcher to conduct my fieldwork because they were trusted by parents and permitted

me as a visitor into the community centre and after-school club on a daily basis (Patton, 2002).

In the first week of my study, the program administrator and youth coordinator invited me for an initial orientation meeting at the community centre. During this initial orientation, I gave a presentation about my study to seven adolescent boys, for recruitment purposes. There was no pre-selection of the seven boys; however, the study criteria (gameplay and narrative writing interest) may have precluded the participation of other boys.

A total of seven boys at an Ontario community centre received letters of information and consent forms for themselves and their parents (see Appendices A-D), in July 2015. Of the seven boys, two of the boys provided consent forms and participant survey responses (see Appendix E). I indicated to the boys that selection criteria would be based on video game play frequency and interest in narrative writing. Based on their interest in playing video games, I selected two adolescent boys who indicated high amounts of video game play and interest in narrative writing. Based on the narrative writing criteria, I may have limited the number of participants who would have been willing to be involved in the study.

The second setting was an after-school video club. Gaining entry to the school involved two gatekeepers, both a principal and a teacher. Once I received the school board approval, I became an observer-visitor (Wolcott, 1997). Initially, I met with the principal for a brief overview of my study and then he introduced me to the gatekeeper teacher who led me to the after-school video club. At this club, resembling a classroom, I gave an orientation meeting describing my study to gain mutual respect with the boys. Early in this process, I was aware of a limitation that my presence and my background as a high school teacher and a researcher could overshadow the naturalistic essence of this study and form certain impressions of authority in the minds of the boys (Patton, 2002). During that initial meeting, I also distributed the surveys and consent forms to six adolescent aged boys, who showed interest for recruitment in my study. There was no pre-selection of the six boys; however, the study criteria (gameplay and narrative writing interest) may

have precluded other boys. Of the four consent forms and surveys returned to me, I selected two of the boys as participants in my study.

For both of these natural settings, after my initial entry was gained, being invited as an observer resulted in a challenging dynamic, that I was clearly an outside observer, an authority figure, a teacher, and would not experience the socialized culture in the same way as this age demographic. Therefore, I needed to time the observations with them to suit their school schedules and their drop-in times at the after-school video club (Patton, 2002). As part of gaining entry, mutual respect and trust from the boys, I also raised awareness to them that their participation in my study allowed their perspectives and voices to contribute to the literature (Patton, 2002).

I wanted to preserve the voices of the boys who were the main stakeholders throughout this study. A case study provides researchers an opportunity to convey experiences of actors who live those experiences, which it achieves mainly “with narratives and situational descriptions of case activity, and personal relationship” (Denzin & Lincoln, 2005). At the same time, simultaneously involving boys’ use of video gaming and their development and adoption of cultural meaning practices provided the uniqueness of my case because I was exploring multiple sets of phenomena. The types of games the boys played did not concern me as much as their responses to playing those games. My intent was to focus on both their responses in cultural meanings and in their behaviors from their gaming practices. This complexity supported a case study methodology for my exploration.

3.2.6 Defining the case boundaries: Participant/site selection.

Recruiting volunteers for a study is part of unique information rich cases (Patton, 2002; Stake, 1995, 2006). For the purposes of my study, my primary goal was to select four boys based on my belief that boys would inform me about the central phenomenon of the study (Creswell, 2005), helping to understand the ways boys make cultural meanings, as they engage in video game play. One of the two cases involved a community centre, which operated as a drop-in centre for youth between the ages of 12 and 18. During my orientation, I introduced my study only to youth between 14- and 15-years old, which included seven boys, given that I had focused on Grade 10, adolescent boys to align with

the OSSLT (see Chapter 1) and boys who shared an interest in playing video games outside of school. In the community centre case, two boys offered to volunteer as participants in my study, after I explained my study and provided information letters and consent forms to the seven boys. For the after-school video club, I followed the same process, providing an orientation talk about my study, focusing on the 14-15-year-old adolescent boys. Compared to the community centre case, my initial talk generated similar interest, and six boys asked for surveys and consent packages. Of the six boys, four completed the surveys and consent forms. For these four boys, I needed to refer to a selection process for cases.

Part of my selection of cases involved a different perspective of the problem (Patton, 2002) which became clear with two of the boys at different sites (the community centre and after-school video club). I thought about the uniqueness perspective, looking for unusual cases that were information-rich (Stake, 2006). Thus, for the community centre case, the two boys who volunteered to participate in the study played, on average, up to 30 hours per week (see pre-survey in Appendix E). At the after-school video club, my process involved selecting two of four boys. Of the four boys, the two I selected at the after-school club played video games 50% less than the other two boys at the community centre. I found uniqueness in the ways they responded to Question 2 of the pre-survey (see Appendix E). For this question, two of the four boys at the after-school video club specifically responded that they played different games alone than those games they played with friends. Of those different games they played alone, one boy played narrative-focused games while the other played puzzle based games. I also reviewed their pre-survey responses from questions three and four (see Appendix E). For Question 3, three of the four boys responded that they shared ideas with online players or friends about the video games they played. One boy responded that he only sometimes shared ideas. For Question 4, two of the four boys at the after-school video club indicated that they “love” explaining about games, writing or expressing ideas about a game’s narrative qualities. While one boy at the community centre indicated he did not have an interest in writing or expressing ideas, the other boy, at the community centre, occasionally showed an interest in writing or expressing ideas about a game’s narrative qualities. The boys

who volunteered in my study provided me an opportunity to understand their stories and development of their cultural knowledge (see definition of terms in section 1.7).

One of my main concerns was to protect the identities, backgrounds, and names of the participants in my study. In order to do this, I assigned each of the boys' pseudonyms. Additionally, any staff members I connected with during the study were also assigned pseudonyms. The pseudonym names of the four boys who participated in this study were Albert, Jeffrey, Mike and Brian. The pseudonym names for staff at the community centre included the program coordinator, Jane who handled the youth programs, and Alice, the youth coordinator. The pseudonym name assigned for the gatekeeper/teacher at the after-school video club was Milly. In order to remain true to ethnographic narrative research, and authenticate the boys' voices for my study, their verbal discourse remained raw and unedited within the results chapter (Chapter 4). Two of the boys, Albert and Jeffrey, were situated at a community centre located in Ontario. This site functioned as a drop-in centre for youth and adults, and within this centre, a video gaming technology club existed. The other two boys, Mike and Brian, were members of an after-school video club, situated in a high school in Ontario.

During these observation sessions, I gathered information-rich, thick descriptions (Patton, 2002) from following and observing each adolescent boy closely, as he played video games and collaborated with his friends or fellow video game players. Rarely have boys been given the opportunity to voice themselves in these types of research projects in the past. Therefore, I also attempted to hear the boys' voices as clearly as possible (Chapter 4) to represent their stories, as much as I tried to conduct this work objectively by observing, posing questions, interpreting, and creating new meanings. I attempted to make sense of how they learned skills in literacies and multiliteracies, through their video gaming practices, as well as how they developed, adopted, and shared cultural meanings in their different contexts, based on what I observed and how I interpreted the data arising from their voices.

For ethnographic case study research, there is a high emphasis on observing the participants with typically several steps involved, such as interpreting various types of data at different levels of intensity (Wolcott, 1997). To gain an in-depth understanding of

a case, rather than the emphasis on the length of time in the field, more concentration is on knowing the setting thoroughly (Wolcott, 1987) by collecting multiple types of data (Creswell, 2005). For my research, I conducted fieldwork in natural settings during the periods of June 2015 to February 2016, to collect in-depth data, which included pre-surveys, field observations, and semi-structured interviews. The field observations included scheduling separate audio and video sequences of their video game play times, reviewing various video games they played, conducting field conversations with them before and after their play times, while at the same time recognizing them as individuals at the sites (Creswell, 2007). For triangulation, during those conversations with participants, I also asked for clarification of my observation notes and interpretations. Additionally, my observations and data transcripts were entered into NVivo (version 9) software. In February 2016, I met with the participants for triangulating and member checking of the final data. The boys carefully reviewed the overall interpretation of the data by reading the transcripts and provided feedback to me.

Fieldwork strategies included one hour open-ended interviews (one per participant), along with observations of the settings. Within the two settings, I interpreted how the boys perceived and saw things differently, and were highly dependent on their interests and backgrounds (Wolcott, 1997). Wolcott (1997) explains how ethnographic research is an inquiry into how ordinary people make sense of their particular settings and experiences. I gained an insider's perspective while I observed the boys' out-of-school video gaming practices, within their contextual settings. In Chapter 4, I focus more on unpacking the complexities of how the boys developed and shared cultural meanings as they engaged in video gaming practices.

3.2.7 Observation at the community centre setting.

Although a community centre is still not as regulated or controlled as a laboratory or a school-based classroom, it still involved a supervised setting. During my observation sessions, at times, I periodically stopped the video recording and asked each boy to help me understand how he was engaging in video gaming practices. Periodically stopping the video also helped to initiate a participant recall of activity for analysis, validation, and justification for the researcher. My aim was to conduct a study with boys enrolled in an

out-of-school community centre setting by observing their video game play, and also by having each boy participate in one-hour semi-structured interviews following these activities. The conversations and interviews permitted me to understand cultural meanings the boys developed during these activities. Through ethnographic analytical methods, and by using a small number of cases, I developed an understanding of how the boys cultivated their cultural knowledge.

3.2.8 Observation at the after-school video club.

In order to initiate a participant recall of activity for analysis, validation, and justification for the researcher, during these observation sessions I followed the same procedure as at the community centre. Additionally, each boy participated in one-hour semi-structured interviews following these activities. The conversations throughout the observation sessions and interviews permitted me to better understand cultural meanings they developed during these video gaming activities. The data for both settings included the video recordings, entered into NVivo (version 9) software for ease of data organization. The data represented a triangulation of the boys' voices and my own reflections. Another important element of ethnographic research is inclusion of the researcher's interpretation through a process called bracketing (Creswell, 2007).

3.2.9 Returning to my questions.

As I engage in this ethnographic fieldwork, I refer back to my research questions in my study to understand the insider views of the boys and to develop an understanding of how they construct cultural knowledge, while engaging in video gaming to develop and share cultural meanings:

In what ways do multiliteracies (The New London Group, 2000), as practiced by boys through computerized video game technologies and associated networks, influence their cultural knowledge?

A subset of this overarching question considers,

- a) What types of video games do boys prefer to use outside of school?

- b) Do, and how do, video game usage and surrounding networks act as contributing factors to boys' cultural knowledge and use of literacy skills?
- c) Do, and how do, social dynamics contribute to boys' multiliteracies skills and cultural experiences?

These questions allowed me to gain an insider view of the boys' experiences by observing them in their social context, as I underlined the 'how' and 'why' of my study.

3.3 Data collection methods and considerations

During my fieldwork, I observed these four boys engaging in video game play and discourse within the various contexts and multiple settings. It was important to triangulate the data as they were collected in order to contribute to the trustworthiness and reliability of that data (Guba & Lincoln, 1994). Creswell (2007) advised the researcher to align his/her observations and interpretations of each event or an accurate reflection of participants' accounts. To assist in accuracy of the research data, multiple strategies included triangulating data from several sources, such as having participants review data transcripts (Creswell, 2007). Based on this premise, my intent was to observe each of the participants over a three-week period to a maximum of 64 hours. During my fieldwork, to develop my understanding of the boys' voices, I was fortunate to observe each of them for three weeks (during the different times they dropped into the community centre or the after-school video club), averaging 10.5 hours each, as they engaged in video gaming and interacting with fellow players, and/or classmates. Table 1 identifies the structure of my fieldwork with these four boys.

*Table 1**Summary of fieldwork from June 2015 to February 2016.*

Setting	Participant	Fieldwork (includes video recordings)	Interviews
Community Centre	Albert	16 hours	1 hour
	Jeffrey	12 hours	2 hours (extended time due to thorough, detailed responses and storytelling)
After-school video club	Mike	8 hours	1 hour
	Brian	8 hours	1 hour
Total Time		44	5

The fieldwork occurred over a range of six months, and included field observations, audio recordings, and interviews for a total of 49 hours with an additional 456 minutes of video recordings. In addition to observing and recording video game play and casual interactions each boy had with others during that game play, all four boys participated in semi-structured interviews (see Appendix F) following the observations (Wolcott, 1987). The purpose was to ensure specific descriptive questions (Spradley, 1979) were asked to capture meaning and shared knowledge. I also engaged in somewhat friendly conversations each day, sometimes at the beginning of the observation, during or at the end of the day, throughout the 6 months, with the boys in an effort to build rapport. As a constructivist researcher, I felt it was important to show interest in their video gaming experience and ideas, which helped to make field observations and the interview appear less as a formal interrogation and more of a natural and safe, caring environment for them.

The one-hour semi-structured interviews conducted with each participant explored the following topics: 1) Types of video games played independently and with others; 2) Ways of learning, such as reading, writing, and analyzing, employed during video game activities; 3) Social dynamics, such as collaborating with others; and 4) Ways boys

behave or build cultural experiences while playing video games. Additional questions were also generated from my probing of the participants' responses to the questions.

3.3.1 Researcher field notes.

For my research study, I understood the need to collect multiple artifacts. The most important element to maintain during ethnographic research is detailed observation field notes containing thick-rich descriptions (Patton, 2002). During my fieldwork, I found that it was important to be attentive to detail, and in doing so, I learned to compile notes, which conveyed rich descriptions. I included my interpretations of cultural knowledge (see definition of terms in section 1.7) as expressed by the boys. I also included an analysis of how the participants made meanings about the settings and their experiences (Patton, 2002). Field notes were descriptive, dated, and recorded with such basic information as where the observation took place, who was present, what the physical setting was like, what social interactions occurred, and what activities took place. Field notes contained the descriptive information that permitted me to return to an observation later during analysis and, eventually, permit the reader of the study's findings to experience the activity observed (Patton, 2002).

Patton (2002) cautioned that during the process of taking detailed field notes, the researcher should be cognizant of personal interpretations of an observation, as it may be too ambiguous or based on norms or stereotypes, which differ from observations. A simple description of what the participant is wearing, or how they exhibit certain masculine traits, should be detailed enough to avoid confusion. Direct quotations, or as near as possible recall of direct quotations should be captured during fieldwork, recording what was said during observed activities, as well as responses garnered during interviews, both formal and conversational (Patton, 2002). In ethnography, as the researcher immerses within the participants' setting, his or her own perspective, feelings and reflections will likely emerge. These reflective elements of the researcher should be included; however, they also need to be independent.

As I collected extensive amounts of data from video and audio recordings and observational field and interview notes, I archived these documents, using a separate database (NVivo, version 9 software) to ensure the reliability and storage of my findings.

Once I collected, triangulated, and analyzed the data, I followed certain ethical steps to ensure proper maintenance and storage of data (Patton, 2002). I used a record keeping system (NVivo systems software and spreadsheet software) for the coded transcripts and analysis of the data (Stake, 1995, 2006). The data that included electronic files were stored on a laptop computer off-site, stored temporarily on a memory stick for transport, and protected through encryption using TrueCrypt Software. Other types of sources, such as online group dialogues, were involved in my research study as video gamers used online surrounding networks to discuss practices with other gamers. When participants of the study engaged with online gamers, I only included responses and reactions from the participants of the study as online gamers provided no consent for the study.

3.4 Ethnographic data analysis of cultural meaning systems

In order to understand the boys' unique experiences as they played video games and shaped cultural meanings in different contexts, I selected a combination of ethnographic-based analytical strategies. As a preliminary step to organizing the data, I relied on graphic representations such as taxonomies of domains or themes (Spradley, 1979). As a means for further inquiry to describe and explain the boys' patterns of meaning, I also relied on the multiliteracies multimodal framework of metalanguages and pedagogy (Cope & Kalantzis, 2009; The New London Group, 1996) (see section 2.24). Using these combined analytical tools, I examined the cases of these four boys to better understand the tools they used in their designing, redesigning, and learning during their meaning-making processes.

After organizing and analyzing the data, I employed a componential analysis, involving a dimension of contrast (Spradley & McCurdy, 1972) to evaluate emerging patterns among the cases. In addition, I relied on my theoretical lenses to make sense of the particular patterns discovered in the data. Discovering that dimension of contrast involves a search for attributes or meanings associated with cultural terms which are based on physical attributes, referred to as denotative. On the other hand, a meaning is termed connotative when it constitutes a cultural knowledge that provides a suggestive or abstract significance to a cultural term, perhaps based on experience, beliefs, or values. This contrast refers to the generalized cultural term and the specific values included in a

taxonomy. For a componential analysis, we search for multiple relationships or the most important attributes for any set of cultural terms. This step compared and contrasted sets of records in the initial taxonomies or categories, and words/meanings created in the available designs and the pedagogy. This comparison helped me to discover the meanings that the participants attached to their experiences, activities, or discourse to build cultural knowledge (Spradley & McCurdy, 1972). Finally, although using the multiliteracies multimodal framework and pedagogy (Cope & Kalantzis, 2009) was a way of understanding meaning-making transformed by boys into their cultural knowledge, a challenge remained in finding a way to extend these meanings into a practical pedagogy for educators, given the current Ontario English curriculum (Ontario Ministry of Education, 2007). In order to address this challenge, I incorporated the Learning by Design framework (Cope & Kalantzis, 2016) to connect these transformed meanings emerging from the boys as a connection to the Ontario English curriculum (Ontario Ministry of Education, 2007).

I analyzed in detail the transcripts of interviews, along with my fieldwork notes, within the qualitative research software (NVivo, version 9) to find emerging patterns, themes, and cultural meanings that the boys were creating and sharing in their different contexts. During my ongoing analysis process, I checked in with the participants during the fieldwork days to ensure that my judgement and understanding of these attributes made sense. For the dimension of contrast, I compared these cultural meanings and attributes across the participants. The final step represents cultural theme analysis (Spradley, 1979), which includes an examination of how the attributes share connections, patterns, or gaps related to the domains and culture as a whole.

3.5 Ethical considerations

I understood from my decision to undertake this research that I faced challenges, such as being a white, Anglo-Saxon female researcher, to build trust with boys, and to discuss how they developed and shared cultural knowledge. Therefore, I understood as a researcher, how my exploration may present a challenge or shortfall in attempting to build trust with the boys who may experience an aversion to discussing or fostering their cultural meanings. I recognized that they might have an aversion to humanities as a

subject. As a female researcher, who is also a teacher, I recognized that I might represent an authority figure to them. Therefore, I needed to be cognizant of my subjectivity as a high school English teacher, and a researcher, so that I would not influence how I interpreted and analyzed the findings. I was also aware of how participants could modify their actions based on reacting to me as an observer, known as the Hawthorne effect (Neuman, 2006). As much as individuals participating in a study can be thoughtful and detailed in their responses, they may have been aware of me as a researcher, constantly part of their surroundings, observing, audio and video recording their actions, and asking questions. At times, I would leave the room where they played video games, to minimize my physical presence.

Other important methodological concerns involve evaluating the quality of research. In order to establish authenticity and rigor for my ethnographic cases it was necessary for me to address four aspects of research, which included trustworthiness, credibility, reliability and transferability. Guba and Lincoln (1994) advised on the importance of ethical considerations and trustworthiness in the study, which means researchers must be objective through the inclusion of all participants' voices. They explained the importance of representing all voices in the study through any texts and to have their stories treated fairly and with balance. Other ethical considerations included ensuring anonymity and protection of my participants; therefore, I used only pseudo names for each participant. In addition, in order to ensure privacy, confidentiality, and protection of the participants, I anonymized all locations and contextual settings. As much as possible, in order to authenticate my case study research, my interpretations and reflexivity, and allow for a diversity of perspectives, I included examples of all of the participants' voices from verbatim conversations of the four boys (Patton, 2002). Including verbatim conversations allowed the boys to speak for themselves in the ways they created cultural meanings (Guba & Lincoln, 1994). These representative texts are also specific to the context and particular settings where the activities occurred and in no way were these interpretations intended to generalize to other boys. This inclusion of the boys' voices in context also added credibility to my interpretations or any judgements I made in the data analysis (Patton, 2002).

Transferability of lessons learned from the specific cultural meanings focused on the emic perspective of knowledge, gained by the boys within their particular context. Use of thick, rich descriptions within these particular contexts contributed to the usefulness of transferability (Geertz, 1973). Achieving transferability involved triangulating multiple sources of the data collected including participants' direct quotations, member checking of observation notes during the fieldwork and final transcripts by each participant (Patton, 2002). These sources of data included my fieldwork observations of videotaped recordings (using a Panasonic 26x optical zoom, model PV-GS31) and audio recordings (using a Sony recorder, ICD PX333 model) of these four boys engaging in activities and discourse, in addition to written pre-surveys for the recruitment purposes and semi-structured interviews. With this research design method, I was particularly sensitive about the observations and data collection phases to ensure objectivity of the findings and analysis. In order to recognize both the safety and protection of the researcher and vulnerable participants, I asked the parent or guardian of each participant to provide consent.

In this chapter, I described the methodological and theoretical frameworks for my study, as well as the analytic approaches I employed for the data I collected during my fieldwork. In the next chapter, I provide the study findings, including descriptions of the contextual settings within which these four boys developed, adopted, and shared cultural meanings, and their raw, unedited verbatim conversations while they engaged in video gaming practices.

Chapter 4

4 Chapter overview: Study findings

This study narrates four individual stories about how the boys came to know and build their cultural experiences—all very different from each other. The study findings elevate the boys' voices by including several verbatim quotations from each of the four adolescent boys, Albert, Jeffrey, Mike and Brian. These quotations serve as rich thick descriptions for this ethnographic multi-case study. The boys' playing of video games seemed an endless dedication, maybe even a passion, not just a way to pass the time. The ways that the boys made connections and found relevance and meaning from playing video games was slowly revealed to me. I had the privilege of observing their cultural worlds and experiencing a glimpse of how they made meaning as they played video games alone, with friends, and online.

Figure 1 illustrates the organization of findings situated within these two ethnographic cases. The information includes two contextual settings where participants engaged in video gameplay. Organization of video games describe the participants' video game preferences and association of meanings they made based on video games they played. The taxonomic analysis represents an initial organization of cultural terms, identifying domains, or themes emerging from the findings within the cases. The multiliteracies lens identifies the different modes of meanings and pedagogical framing to situate these findings.

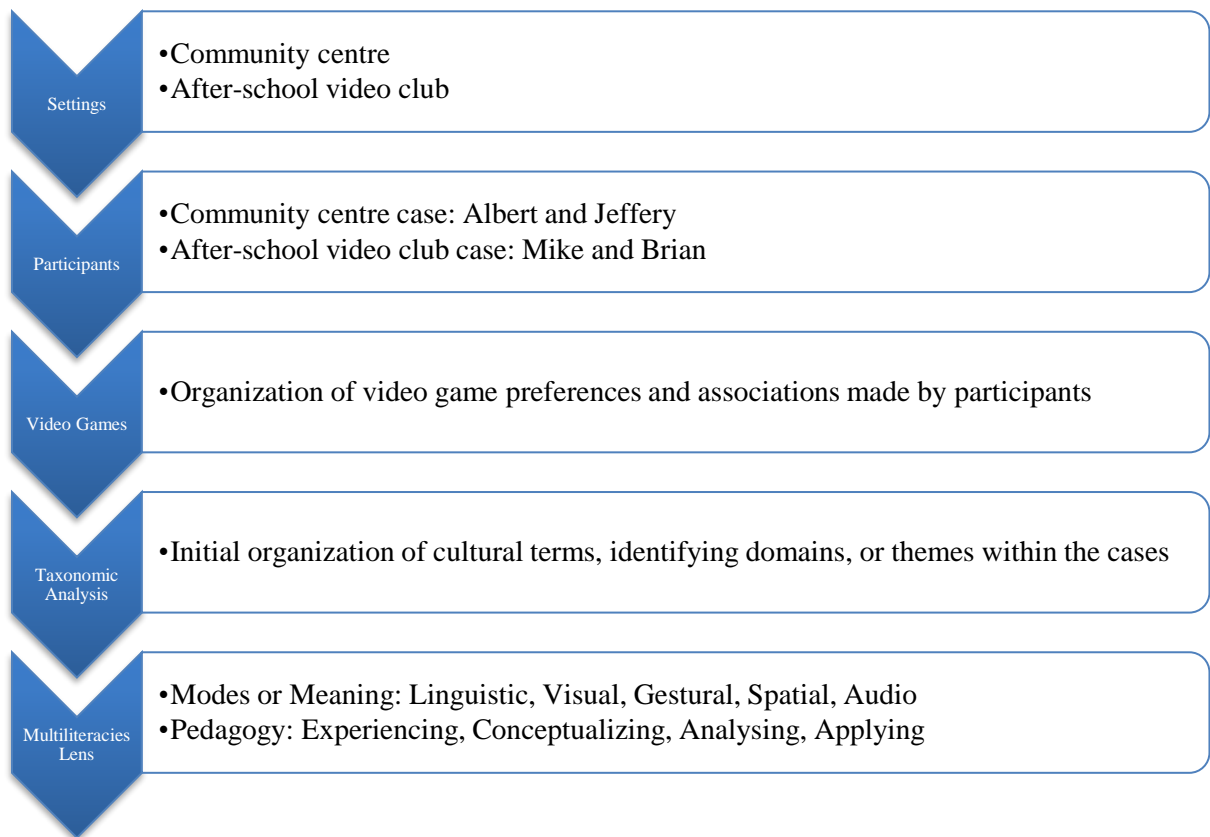


Figure 1. Visual Map of Findings.

4.1 Community centre case: The setting—some little town

Driving along a lonely stretch of highway in the early days of summer, I was excited and nervous about my meeting with the coordinators/gatekeepers about my fieldwork. When I spoke with the program director, he explained to me that my direct contact would be with the program coordinator, Jane, as she handled the youth programs at the community centre. In addition, Alice, the youth coordinator would be my daily contact for the computer games area.

At the community centre, the staff and program coordinator, Jane, cheerfully greeted me. She raised one concern about the study: She wanted to ensure I observed the open-door policy, given the amount of time involved. I assured her that videotaping occurred only

for the participants in the study so there was no need to close the door of the computer games room. No recordings of any other youth would occur, nor would any information be used about them if they were not part of my study. Satisfied, Jane then contacted the youth coordinator, Alice, to come to the front of the office to lead me to the computer games area. As I took in all my surroundings, my initial impression was that the centre represented an openness to all with a friendly, welcoming atmosphere.

Alice walked with me along the white corridor. As we casually wandered along the corridors, I noticed that all of the staff in various activity rooms chatted with the youth. I noticed a number of closed doors to rooms. The centre seemed to be quiet except for the occasional kids' laughter I heard emanating from rooms as I passed by. I assumed these were for activities based on the different signs posted by the doors. I also noticed rules displayed on the hallway walls throughout the community centre. She also mentioned that the boys in the centre were very keen video gamers but that they did not always keep a regular daily schedule at the community centre. Alice also explained to me that the youth usually would drop in and play whenever they wanted, so the games room was always open for them. She explained that a youth coordinator or staff supervisor was present in the activity rooms monitoring the behavior of the youth or guiding them through any questions they had. She alerted my attention to the posters and signs on the wall indicating the rules of the computer and games room areas. All youth and visitors must adhere to those posted rules. These rules were the same as the ones posted in the hallways and contained the following words: "No boisterous play, no bullying, no swearing, respect for others, property and equipment. No discrimination, no violence, no weapons, no drugs, no alcohol. Respect for everyone with actions and language." These rules were enforced by supervisors, who by their constant presence in the computer activity rooms, represented a sense of authority and somewhat of a deterrent to misbehavior. Alice told me that for the most part the youth respected the rules, but when necessary, the supervisors would intervene.

As Alice led me into the large computer area, I immediately noticed the clean environment and white washed walls. Three large 'Rules' signs which were dark blue with reflective white lettering were highly visible, even when the lights were dimmed. I observed the rules signs clearly posted on each wall and one in the smaller computer

games room. The larger computer area was very quiet, but it was early and the youth had not finished with their activities in other areas of the centre.

4.2 After-school video club case: The setting—some big city

It was early September 2015, when I received the call from a principal of a high school located in a large city in Ontario. He explained to me on the phone that there was a teacher, Milly, who conducted an after-school video club and was inviting me to this club, as some of the boys might want to participate in my study. The principal explained to me that the club would be starting up in mid-October and that would be the best time to visit. I began to prepare for visiting the club to recruit boys for my study.

This big city was vastly different to the small town I had visited where the community centre was located. When I arrived, it was rush hour in this big city. On my first day, I was scheduled to meet with the principal. Even though I had left very early in the morning in order to ensure I wasn't late, I was met with a number of traffic jams and overall congestion, causing me to almost miss my scheduled appointment. It was the middle of October 2015, mid-week around 10:30 a.m. My meeting with the principal was positive and he scheduled a day for me to meet with Milly so that I could have access to the after-school club for recruiting participants.

I made my way through the old school corridors. The corridors were dusty, and the doors made a creaking sound when I opened them. As I walked along the corridors, I could hear the voices of many students cheering and some yelling. The noise appeared to come from the gym. They sounded like they were playing a sport. The environment of the after-school video club, usually attended by more than 50 students, mostly boys and some girls, at a time, was loud, and the sounds and music from the video games contributed to this high energy space. Once at the after-school club, I gave a brief introduction of my study to the students in the club and distributed the surveys and consent forms.

4.3 The participants

Four boys participated in my multi-site study of two ethnographic cases. First, I briefly describe two of the boys who were included in the community centre case; second, I describe the other two boys who were included in the after-school video club case.

Upon meeting Albert (the community centre case), I observed that his behavior appeared to be very quiet, never seeming to talk to anyone. Albert, a 14-year-old adolescent, was tall and had a thin physical stature. I observed him to be very courteous and respectful to me and to other students. The other students, not part of the study, I observed as being loud and very boisterous; at times, I noticed them pushing each other and yelling. I observed Albert, who was generally focused on his video gameplay and tended not to mix with the other youth at the centre. For Albert, the community centre did not appear to be a formal place where he received much useful guided practice – either experiencing or conceptualising (Cope & Kalantzis, 2009; The New London Group, 1996) for his designing and redesigning knowledge processes. More specifically, I observed his meaning-making, such as problem-solving and analyzing, present in his independent play and use of online surrounding networks. Even if other youth were conversing with him, he would maintain his concentration on his video gameplay, nod or talk to them, but without moving his eyes away from the computer screen. Albert generally maintained a consistent routine: he would come into the video games room daily; used gestural representations by walking quickly over to the table, pulling out a chair to sit down and claim the same computer (Cope & Kalantzis, 2009). Albert explained to me that he would often play certain video games to practice his problem-solving and analytical skills and then access surrounding online networks to interact with other gamers or peers by demonstrating what he had learned independently. I observed that he did not share these designing and redesigning knowledge processes with peers at the community centre.

The second participant in the community centre case was Jeffrey. When I first met Jeffrey, a 15-year-old adolescent, I noticed that he was slightly shorter, but larger in physical stature than Albert. I observed that Jeffrey, like Albert, did not seem to be social with the other individuals at the community centre. He frequently conveyed his gestural representation (Cope & Kalantzis, 2009) through his facial expressions, which appeared

to be frowning or agitated when other noisy students were in the computer video games room. I observed Jeffrey to be very quiet and introspective in his actions. Although observations of Jeffrey's personality would be difficult to justify and would require further investigation for a future study, I frequently noticed in later observations and casual conversations with him that he preferred not to interact much with others. The community centre did not seem to offer Jeffrey opportunities for the ways he made meanings during his learning processes—either experiencing or conceptualising (Cope & Kalantzis, 2009; The New London Group, 1996). During observations and conversations, Jeffrey revealed aspects of his mastery of several video games, practices, and particular discourses such as storytelling—an example of oral language (Cope & Kalantzis, 2009).

During my fieldwork, Jeffrey only engaged in conversation with me when other students were not in the video games room area. I was not aware of any particular reason, and wanting to be sensitive and at the same time objective, I listened to him. Early in my fieldwork, Jeffrey requested, as a participant in my study, that he would prefer to talk about video games with me, if I was willing to listen, rather than play the games. One of the reasons he explained to me was that the available games on the video games room computers were not the narrative-driven video games which he preferred to play at home, where likely most of his experiencing occurred. Jeffrey was highly articulate in his conversations with me, often telling stories about the video games he played, demonstrating an example of drawing on the oral language representation (Cope & Kalantzis, 2009). The community centre setting became an important factor for Jeffrey's behaviours. He always appeared to be conscious of his surroundings (Wolcott, 1987)—the room, its function and people interacting around him. He would often take up gestural representations with his abrupt body language of walking into the video games room, turning his body, and then leaving if other kids were in the room. At the post observation interview, Jeffrey shared that he had autism, which may have accounted for this behavior, although I did not make previous connections between his autism and his lack of success in engaging with others. Moreover, it also did not appear to impact the way that he provided thoughtful descriptions and stories about the games he played, often talking for long periods with me. Neither Albert nor Jeffrey interacted socially with peers or each other at the community centre.

The third participant, Mike (after-school video club), was a tall 15-year-old adolescent, with a thin physical stature. Mike was the president of the after-school video club. I observed him as friendly and respectful to me and to other students in the club. Mike chatted with everyone, ensuring all were enjoying playing the games. During my observations, Mike generally focused on his gameplay but still found time to bond with other players. He also appeared to be interested in mentoring other players. He would frequently pause a video game sequence during a competition to instruct other players on gameplay functions, strategies, or problem-solving. In doing so, Mike demonstrated his knowledge and willingness to share his experiences and meaning-making with others. Thus, the after-school video club appeared to be a formal and informal place for Mike to design and redesign his knowledge processes, providing him opportunities to experience and conceptualise with others (Cope & Kalantzis, 2009; The New London Group, 1996). Mike's meaning-making also emerged from his rich collaborative interactions in the online surrounding networks and communities of practice (Alexander, 2009; Squire, 2013). He constantly exchanged strategies, ideas, and best practices with others who shared a connection and common video gaming goal with him (Gee, 2007). Being the president of the club, Mike took up his gestural representation (Cope & Kalantzis, 2009) by walking ahead of everyone, and setting up the room to organize the activities. He wheeled in the televisions and consol/vcr, turned on the widescreen overhead projector and selected the teams for gameplays. I observed that some of the boys could express themselves freely and emotionally by hugging, clapping, and cheering each other when they played the video games. The girls tended to chat with each other, eat and watch the video gameplays. Often times, Mike responded to the boisterous environment of the club by drawing on gestural representations (Cope & Kalantzis, 2009), characterized by chatting, clapping, and cheering along with the other students.

The fourth participant, Brian (after-school video club), a 15-year-old adolescent, was shorter and slightly larger in physical stature than Mike. I observed Brian to be friendly and respectful to the other students, but he did not appear as talkative as Mike. Brian frequently conveyed his gestural representation (Cope & Kalantzis, 2009) by quietly walking around the room, observing others, and asking Mike when he could be the next player in a particular gameplay sequence. During video gaming experiences, Brian was

quick to share his meaning-making experiences with fellow peers by explaining certain gameplay sequences. Although some of these observations would be difficult to explain without further probing in a planned future study, Brian appeared to be conscious of the high-energy surroundings in the ways he demonstrated his gestural, visual and spatial representations (Cope & Kalantzis, 2009; Wolcott, 1987). During his game playing experiences, he would draw on video game characters' functionality to jump, dance, and perform acrobatic movements on the computer screen. Some of these actions represented ways that Brian showed mastery of his skills in the video game, but they also demonstrated Brian's ability to navigate the various interplay of visuals while playing the game. Additionally, these action sequences represented for Brian some of his emotional gestures, feelings, and emotions. He would sometimes physically perform these same movements in the classroom in front of his peers, and did not appear inhibited by the surroundings, peers, or the space he occupied. In some ways, Brian demonstrated weaving his experiences with peers (Cope & Kalantzis, 2009), by openly demonstrating unfamiliar actions and texts with others. Moreover, for Brian, similar to Mike, the after-school video club appeared to be a formal and informal place for Brian to design and redesign his knowledge processes (Cope & Kalantzis, 2009). Brian appeared to be an expert in video gaming, and he would often find ways to mentor other players and share experiences. He would pause a video game sequence and guide other players in the mechanics of characters and gameplay strategies.

Both Mike and Brian interacted with fellow peers by often drawing on spatial representations (Cope & Kalantzis, 2009). During many video gaming experiences, they would physically sit close together, occupying small spaces on the classroom desks, interacting, and clapping each other's hands. These interactions indicate ways of bonding and relationship building whereby authority and peer power groups appear to be minimized (Mac an Ghail, 1994)—a form of experiencing and analysing (Cope & Kalantzis, 2009). Their interaction appears to be of peer support, encouraging and cheering each other on. In this way, the after-school video club appeared to offer both Mike and Brian ways of making meanings during their learning processes.

4.4 Video game preferences

The boys conveyed meanings through a metalanguage of cultural terms they associated with video gaming. Cultural terms emerged during our conversations when they described for me the ways they used video games and their video gaming experiences. Based on their video gaming experiences, they would draw on available designs such as linguistic (Cope & Kalantzis, 2009; The New London Group, 1996) as a resource of meaning-making. For example, they explained to me the importance of knowing a video gamer's "play style", understanding the "mechanics" of a character for a video game, or playing or choosing video games in which to "be smart in."

First, I needed to understand what types of video games, as illustrated in Figure 2, that the boys played. Following this, these cultural meanings and other terms are presented and analyzed in Table 2. My research sub question (a) "What types of video games do boys prefer to use outside of school?" is addressed by the diagram illustrating video game types (see Figure 2) that I identified in the data (based on the survey responses, observations, my own field notes, discussions, and semi-structured interviews). Each of the boys spoke of their interests in certain games and ways they used games to make meanings, collaborate with others, and learn.

As a non-video gamer, I was apprehensive about being able to understand their culture. Thankfully, I willingly absorbed an orientation the boys gave to me. One of the ways that the boys built their cultural knowledge (see definition of terms in section 1.7) was organizing distinct symbols or terms into categories based on how they defined or classified their multimodal meanings. They explained there are different types of games, which they identified by using several cultural terms, categorized separately into video game types. I began to learn and understand how they differentiated video gaming. I also began to understand from the boys some of the cultural terms introduced to me by them about these different games. These cultural terms included "point-and-click", "puzzle platformer", and "escape" games.

These games represented the types of video games the boys played. From these types, other cultural terms also emerged. The boys made references related to their responses, reactions, and connections to these games. These connections highlight how the boys

demonstrated features of intertextuality (Cope & Kalantzis, 2009; The New London Group, 1996) by articulating new ways and establishing practices between different modes of meaning (linguistic, visual, spatial, etc.). Other cultural terms included “problem-solving”, “training”, “strategy” and “decision-making” to name a few. The other types of games had very different meanings for the boys relating to “emotion” and “being smart in” referring to the “adventure” or “narrative/story-driven” video games. First readers should familiarize themselves with the categories or taxonomy of video game types that this study encompasses. Throughout my study, I refer back to the video game categorization (Figure 2) because this was the source of reference provided by the boys, relating how they made sense of their cultural knowledge. I also examined how their responses, reactions, and activities map into the multiliteracies multimodal model and pedagogy (Cope & Kalantzis, 2009; The New London Group, 1996). Each of the boys described for me the different video games which they divided into four types. I also discuss how the boys often used and referred to a variety of different games, all for different purposes and different meanings to construct their cultural experiences.

The following categorization of video game types (Figure 2) reveals some of the references and cultural meaning systems they shared with me as I was ushered into their cultural video game world. The boys distinguished meaning-making by the different types of games they played. Rather than just the names of the games or the developer, the boys explained what the games represented to them, how they developed discourses about the games, and for what purpose they used them. Figure 2 represents the various video games categorized and organized by the participants. Columns one, three and four represent participant responses based on their associations made about their video game preferences.

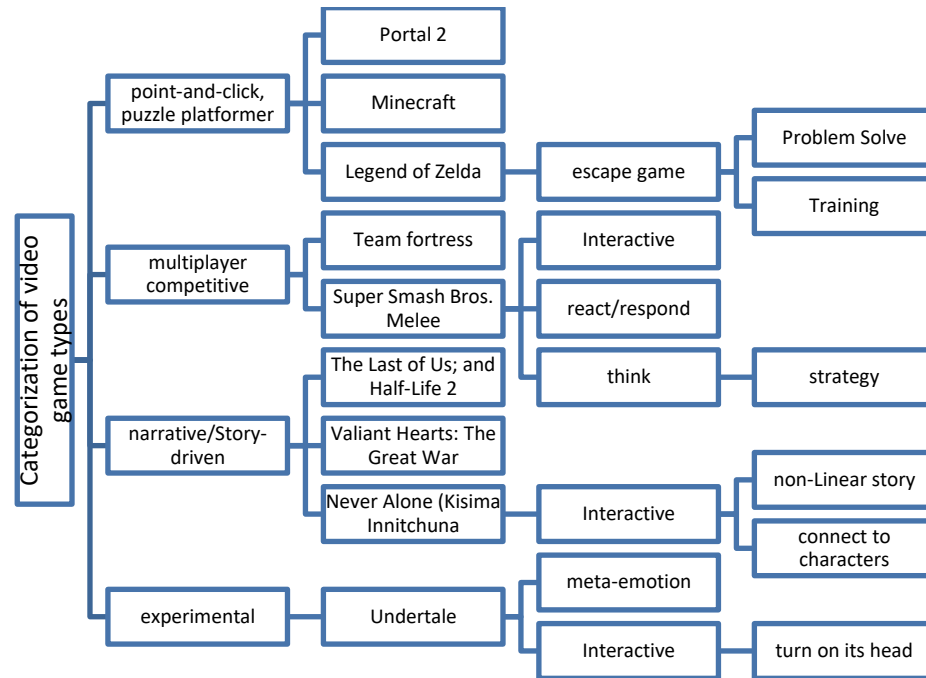


Figure 2. *Categorization of Video Game Types.*

Each of the boys held very different meanings of terms, experiences, and how they acted on those meanings. How the boys differentiated and came to know their cultural experiences about video games was by defining and classifying types of video games into categories. Cultural knowledge is not a just a collection of cultural terms, but a meaning system, also referred to as cultural weaving in the experiencing meaning-making process (Cope and Kalantzis, 2009). Moreover, the meaning of a term represents the theory of its relationship to other terms (Spradley, 1979; The New London Group, 1996). Therefore, to understand the cultural meaning system of these four boys, I first searched for cultural terms that were common among them, and then I began to develop a domain analysis, based on the relational theory of meaning and use of those terms. It's important to note that cultural meaning systems are made up of different cultural terms that are meaningful to people. In domain analysis, the ethnographer needs to decode those terms to identify the meanings attached to those cultural terms. To do this, and understand the cultural meaning systems, I needed to discover the subtle relationships among those cultural terms and to prepare an initial groundwork for those meaning systems. Once the cultural meaning system was established, I relied on my multiliteracies lens to determine how

those meaning systems were influenced by the multiliteracies multimodal model and pedagogy (see section 2.24). Many of these cultural relationships relate to a set of universal semantic relationship coding system. To help organize my data initially, I relied on a number of universal coding from Spradley (1979) for my study and domain analysis worksheets. During this process, I identified cultural terms (representing suggestive significance) (Spradley, 1979), to be included in the domain (cover term) along with the semantic relationship for each domain. The cultural meaning was derived from how participants related to these cultural terms or made meanings of these cultural terms. The cultural terms that the boys used referred to how they made meanings about experiencing a situation with a video game or other cultural experience, and how they demonstrated the particular domain. Following this initial domain analysis phase, I selected a sample of these cultural meanings and analyzed these in relation to the multiliteracies framework and pedagogy (Cope & Kalantzis, 2009).

4.5 Summary of key findings: Cultural domain taxonomy

Table 2 represents the various domains or themes that emerged from the findings. It illustrates an initial organization of cultural terms identifying domains or themes within the cases. A sample of participants' exact words verbatim provides a description to each cultural domain.

Table 2

Cultural Domain Taxonomy

Cultural Domains	Sample Cultural Terms Made by Participants
Decision-making	A lot of decision-making; thinking ahead too; different decisions to get different outcomes
Problem-solving	Teaches you how to analyze things; sort of helps them in solving problems; good at puzzles; build different things
Learning strategy	Being smart in, I prefer strategy; reading your opponents; tools, better

Cultural Domains	Sample Cultural Terms Made by Participants
Training, teaching others, teamwork	<p>tools, mechanics; predict psychological aspects</p> <p>Plot and characters I talk a lot to people about; where your peers are the best training partners; I mean collaboration; I try super hard to have them cooperate but it never works, with friends you know them, you can cooperate with them</p>
Exploring or experiencing emotion by interacting with narrative focused games	<p>This game is interesting because it explored this feeling; I really enjoy games like that explore metagame ideas, or like emotional ideas- interactivity; the game sort of mixes emotional storytelling along with great gameplay; emotions pushing the boundaries of games; change story, non-linear storyline</p>
Sharing moments by learning and understanding	<p>Plot and characters, I talk a lot to people about; I'm gonna be the one to creating, game related things, it's usually like thinking about mechanics; I'll share them with someone who is capable about stories; helps me to learn and get better; took this cliché from this other game, just turned it on its head, made it five times more interesting; you learn about that which could help with literacy</p>
Choice of characters – gender, violence	<p>Choosing characters ahhh has never been ahhh a question of masculinity; I would either choose like either gender; I don't like violent games ... umm yeah I'm actually proud that I don't like that stuff; I don't consider myself a particularly masculine person anyway</p>

Cultural Domains	Sample Cultural Terms Made by Participants
Cultural insights – accepting community, online community of practice	Parts of the game – cultural insights, little videos you would watch ... Elders come up to a camera; they would talk about the wisdom, the Elders; I actually met a lot of friends through Melee; pretty much my best friends are all in the video game club

4.6 Community centre cases: Albert and Jeffrey

I spent most of my time with the boys at the computer games area, which, most of the time, was relatively quiet. Occasionally, the boys would talk to each other and collaborate on strategies for the games that they played. I quickly came to not only understand and appreciate the genuine sense of success or failure experienced by each of them as they played the games, but also their tremendous level of thoughtfulness and meaningful insights about their cultural experiences during their video game play.

I identified the data based on observations, my own field notes, video and audio recording, discussions with the boys, and semi-structured interviews. I mapped a sample of meaning-making representations (such as written language, oral language, visual, audio, tactile, gestural, and spatial) or modes of meanings to the multiliteracies multimodal framework and pedagogy (The New London Group, 1996).

At the same time, if we recognize that learners can design and redesign their own knowledge processes by meaning-making systems that draw on these various representations, then a method or framework is necessary to support that view (Cope & Kalantzis, 2009; The New London Group, 1996). In addition, Cope and Kalantzis (2009) stated that a transformative pedagogy based on the creative and cultural dynamic of meaning-making involves pedagogical acts or knowledge processes, including experiencing, conceptualising, analysing, and applying (see section 2.24). My research questions are addressed by the multiliteracies pedagogy (Cope & Kalantzis, 2009; The

New London Group, 1996) and by the sample data (see Table 4) representing the practices, experiences, and extended cultural knowledge that was developed, adopted, and shared by the boys.

The following section outlines the sample data of meaning-making for Albert and Jeffrey in the community centre case. In this next section, I present the domain of themes related to the community centre case by presenting the findings through a multiliteracies lens in two parts. The first part considers the design process of how Albert and Jeffrey made meanings in their video gaming practices (see Table 3). The second part considers the peer mentoring, collaborating, and developing of cultural knowledge (see definition of terms in section 1.7) based on multiliteracies pedagogy (see Table 4). This table represents the demonstration of formal and informal instruction or ways they participated in their community of practice.

4.6.1 Community centre surroundings.

My findings are presented here as the focal point of the boys' (Albert and Jeffrey) cultural experiences. I also present my observations of the community centre surroundings as they unfolded, as well as the boys' reactions to those surroundings. Following this, I present a brief introduction about each boy to add to the surroundings context (Wolcott, 1987).

The boys were highly aware of the rules posted on the wall, at least most of them were, and acted accordingly. The community centre established a place where the boys could immerse themselves in video gaming practices, exchange discourses, and experience new meaning-making with other on-line communities of practices and peer-to-peer collaboration. I mentioned that I would observe them and that they were free to be as responsive as they wanted to be about their reactions during video game play. They could show reactions, yell, jump up and down or whatever they wanted. In other words, within their experiencing (Cope & Kalantzis, 2009), they were capable of playing multiple roles based on their backgrounds and experiences; however, they were also consciously aware of controls within this space. Albert was quick in his reaction to point out the posted rule sign to me and told me "no you see we're not allowed to make noise, and we have to wear these earphones, so no one hears the video game." His quick reaction to point this

information out to me, disputing my suggestion, demonstrated his keen awareness of his surroundings and suggested that he routinely followed the rules.

The open space for the centre was quite large and housed the main computers. This room included a mix of boys and girls using computers, chatting, and wearing headphones. Within this room, these main computers contained no access to the computer games. Alice told me that the computers included social media programs for youth to access. The enclosed video games room, where the boys played, was quiet as evidenced by all the boys, in this room, wearing headphones when they played video games. The youth at the centre appeared to interact with each other in a friendly way. The youth coordinator, Alice, seemed to act more like a mentor, exchanging friendly conversation with the youth. The computer games room had one exit. It was a small room about 12 x15 feet, housing eight computers that were tightly packed together. Along the one side was a window, looking out into the space where other youth gathered to use the main computers. The colour of the walls within this room were neutral tones. I observed that the tiled floor was clean and had chairs neatly placed at each table for each computer. These chairs were similar to those found in high schools, made with molded plastic with low backs and no wheels. I entered the open door for the video games room and noticed the lights, which fluctuated from low lighting at times to brighter lighting at other times. I never asked why the lighting was low, but perhaps it was to save energy, reduce the glare on the computer screens, or to provide youth with a theatre style experience. The ceiling was low, and the room was small, with not much space for movement. However, it certainly resembled a space where a close-knit community of learners, such as experts and novices, could exchange ideas and mentor each other in designing their learning processes. The computers appeared evenly distributed on long tables throughout the room, with some against the back wall, some in the centre, and others against the sidewall. Occasionally, some youth would walk into the video games room and peer in the window. In a way, it almost seemed like the youth inside the video games room were on display or in a laboratory. Some of the adult staff supervisors at times in the video games room appeared disengaged and did not approach the students. However, they generally remained in the area that housed the main computers and rarely entered the smaller video games room area. Occasionally, I observed staff who were pre-occupied

with conversation and unaware of some students who were loud and arguing with each other. A couple of times, I also noticed these kids pushing each other, but this behavior seemed to go unnoticed by the staff members. Perhaps the staff knew about the social dynamics of this youth culture and perhaps they knew when to acknowledge and address a conflict.

4.7 Multiliteracies: Use of modes of meaning in designing processes in community centre case

Table 3 represents a sample data of the multiliteracies' modes of meaning (Cope & Kalantzis, 2009) expressed by Albert and Jeffrey as they engaged in their video gameplay. The multiliteracies modes of meaning include linguistic, visual, gestural, spatial and audio modes.

Table 3

Sample of Available Designs for Albert and Jeffrey's Meaning-making.

Linguistic (written and oral)	Visual (moving images)	Gestural (includes tactile - feelings)	Spatial	Audio
Albert often stops his gameplay to read the scrolling story text and online character dialogue (at times mouthing words) in Half-Life 2 (see Figure 2).	Albert constantly reviews different images of character elements before making choices in gameplay. He generally chooses an engineer.	Albert expresses how he routinely and frequently plays certain games- "Ahh cause like the more games I play the fun I have with them and It makes me feel ... like I'm actually in the game and not just playing it."	Albert chooses repeated images of an engineer, explaining it will help the team and environment to build.	Albert has increased verbal conversation when he plays with Jeffrey. Reading out what he views on the screen, giving directions and asking questions.
Throughout the game Team Fortress 2,	Albert makes references to external	For intense play, Albert wraps his feet	Albert reviews specific background	Albert enjoys the music and sound effects

Linguistic (written and oral)	Visual (moving images)	Gestural (includes tactile - feelings)	Spatial	Audio
Albert pauses and reads the commentary from online players, reads directional information on screen frames and then builds items or chooses characters.	comic strip characters, such as Marvel.	around the chair and moves the chair inward towards the table so he is close to the computer screen.	settings in the video games prior to playing. He often reviews maps within a game to anticipate needs for protecting certain areas.	from a game to experience it fully.
Jeffrey has online discussions (chat party), writes on social media about games he plays	Jeffrey explains how games have character customization, with the ability to change outfits, eye, and skin colour	Jeffrey's body movements indicate a critical spectator when he stood behind players closely to watch their gameplay.	Jeffrey shows interest in describing the setting, characters, and how they react in an environment.	Jeffrey talks with friends about plot, characters and video game storylines.
Jeffrey plays narrative-based games and has a keen interest in storytelling.	Jeffrey prefers to create a character that he thinks he should look like in a game.	Jeffrey expresses feelings about playing online games with multiple players: "so like even with a really small amount of people you still feel clustered ..sorta how the game feels ..you sorta feel isolated ... you	Jeffrey refers to the design of games with clustered maps, limiting character movement – indicating an emotion of isolation.	Jeffrey explains how he has discussions with friends, questioning why events happen in games with emotional events.

Linguistic (written and oral)	Visual (moving images)	Gestural (includes tactile - feelings)	Spatial	Audio
		feel...you feel cramped.”		
Jeffrey reviews game developer research on games for understanding of authenticity. He illustrates his knowledge about Native heritage in Never Alone (Kisima Innitchuna) (see Figure 2).	Jeffrey plays games that have built in video images and pictures. Games relevant to him relate to history and Aboriginal culture.	Jeffrey frequently shows facial gestures, emotion, during video gameplay.	Jeffrey uses games with story-driven designs that relate to actual events in history – relevant cities with multiple background settings such as The Last of Us (see Figure 2).	Jeffrey prefers to subvocalize during games, reacting to the gameplay actions, sounds or observing others playing.

4.7.1 In what ways do multiliteracies influence cultural knowledge?

To construct meaning, Albert often interacted with complex elements within the video games, such as when he played a video game called Half-Life 2. In his process of experiencing by drawing on available designs from the multiliteracies framework (such as linguistic, audio, gestural, etc.) for meaning-making (Cope & Kalantzis, 2009), Albert did not pay as much attention to embedded storylines in video games, but would often stop the gameplay to read the scrolling story text or online character dialogue. Albert's interactions with these various elements of the game increased his use of available designs with which he could make meaning about story outcomes or strategies. Albert made use of the dynamic combination of visual representation (moving images, characters), along with forms of written language (scrolling text) and his active gestural representation (subvocalizing or mouthing the words, along with eye movements to read the text). Albert's demonstration of active borrowing of designs from the multiliteracies framework provides examples of him experiencing the new by the way he makes connections between the text, images, and his own understanding.

Although Albert tended to be play video games independently, he became an online team player when he played a game such as Team Fortress 2 within the surrounding online community of practice. Albert gained insights from the written language of screen text directions or commentary from online players. These actions remind us of the shift in traditional literacy practices, such as linear reading on the page. Albert would pause, read commentary from other online players, read directional information on screen frames, read maps, and then respond with a strategy, which he explained, “would help the team in some different ways.” Building on this directional guidance, Albert constructed these multiple meanings by borrowing from the visual representations, building items, or reviewing different images of character elements before choosing different characters, like a medic or engineer, and responding with his strategy. Albert’s active engagement with alternative out-of-school texts is representative of his ability to manage effectively these complex elements embedded within the games. Albert was meaning-making at a metacognitive level from the way he drew on paratexts during his video gaming practices. For example, while playing a multiplayer competitive game with a peer, Albert remarked how there were many references in the storyline to Marvel comics. This comment contributed to the way he explored paratexts to understand the interplay of the plot. By making connections and relationships with external resources, he was able to frame his understanding.

Albert’s actions and responses showed persistence with problem-solving. He appeared to be very patient, quietly concentrating, at least for the video games he chose to play at the community centre. Albert explained to me,

But what you have to do is use a portal to get the companion cube up there, go through the portal to get in ... but you’d also have to shoot a portal ... through the opening cause you can’t shoot it through the barrier otherwise it would ... the portal wouldn’t work. (Albert, personal communication, community centre case, August 2015)

From his detailed description, Albert appeared to have used different strategies in his play style to achieve his goals. In order to create meanings and advance his learning processes, Albert worked with options of integrated images. He engaged with these different

multimodal elements to make meaning, drawing on available designs, such as visual representations (e.g., objects, moving images, lights), gestural representations (e.g., moving the object by using the mouse and watching with his eyes), and spatial environment (e.g., understanding the layout on the screen, different frames). Albert's ways of playing and his reliance on puzzle platformer games demonstrated his cultural meanings within the problem-solving domain.

One of the ways Albert made meanings was by expressing certain feelings when he routinely and frequently played certain games. These games were characteristic of ones containing multiple semiotic systems, overlaid with symbolic sounds, background music, and textual instructions. Albert commented, "ahh cause like the more games I play the fun I have with them and it makes me feel ... like I'm actually in the game and not just playing it." In this way, Albert was practicing his skills at making decisions, problem-solving, and reading multiple semiotic systems on the screen simultaneously. In playing these types of games, Albert's meaning-making may be a reason for developing operational forms of literacy, such as decision-making and reading multiple semiotic systems. Albert routinely played a certain game, perhaps like a ritual. His explanation reinforced the ways he drew on gestural representations when he made interpretations and meanings about the game in the form of feelings and emotions.

Albert's actions and comments also coincide with the observations that he made about certain games raising his awareness of experiencing. Often Albert increased the range of available designs offered in a game, which he would then draw upon. Some of these designs included listening to the audio features of the game, and reading or responding to on-line commentary from other on-line players. Albert commented about the way games provide a combination of both visual with audio representations, such as music and sound effects, which reinforce a full experience and a sense of immersion for him to enjoy a particular game. This interplay of on-screen graphics (maps, colors, symbols, characters, on-screen character dialogue) positioned Albert as a meaning maker or an active player, aware of all of his senses for the game. Albert's openness to experience this interplay of the games' elements is a form of literacy. He was designing meanings through his cognitive processes such as reading, listening, and viewing.

The ways in which Albert made meanings through his gestural representations may signal that he wanted to create a physical connection between himself and the video game elements. Albert demonstrated this by wrapping his feet around the chair and moving his chair inward towards the table, so he was sitting closer to the computer screen. These actions implied that Albert wanted to create a sense of immersion within the game by reducing the distance between himself and the computer screen. His sense of proximity to the screen, and ultimately the video game, is an example of the way he uses the spatial representation in his video game practices. Albert would also draw upon spatial representations during his meaning-making by increasing his awareness of the layout, territory, landscape, and general background of a game. When playing certain multiplayer competitive type games, to gain an understanding about the game, Albert reviewed specific background settings in the video games prior to playing. Choosing to review maps within a game to assess and anticipate any need for problem-solving, protecting areas, or potential threats as requested by other online players, may be a reason why Albert intensified his experiencing the new from the context in his video gameplay. Drawing on these spatial representations suggests that perhaps Albert wanted to design and construct new meanings through problem-solving and strategizing. Furthermore, his problem-solving skills and ability to provide walkthroughs was enhanced by playing the games such as Minecraft, and Portal 2.

A major factor associated with how Albert constructed his cultural knowledge was his preference for playing certain games. Choosing puzzle games, for example, was a way for Albert to problem solve while multiplayer competitive games provided a way for him to build by choosing certain characters and being part of a team. Rather than follow the game sequences, he concentrated his efforts on building and constructing. According to Albert, “you can build different things, portals and dispenser ... Ahhh ‘cause when you’re engineer, you can build different things.” He explained this to me, ignored his train of thought, and then returned to the task at hand: “I was just gonna build almost at the wall.”

Although Albert appeared to be self-motivated in his use of formal and informal instruction, occasionally he borrowed from written language (screen text with online players), and audio representations (sounds, noises, hearing, and listening to others) to

demonstrate meaning-making. Being a team member online with others emphasized how Albert participated in his situated play as he negotiated new strategies and demonstrated ways to collaborate with other online players. At other times, Albert played video games with the other study participant, Jeffrey. During these times, both Albert and Jeffrey appeared to work seamlessly together. Many of my observations in my fieldwork showed that they both took an interest in hearing and listening to each other, verbally collaborating and giving each other simultaneous directions during what seemed to be very fast-paced multiplayer competitive video games. The following is an example of their conversation during one of the video game sessions:

ALBERT – I don't see any

JEFFREY – black and blue uniform and camouflage helmet

JEFFREY – why ... why

JEFFREY – Ok I got everything

ALBERT – yep that's right

JEFFREY – this is a bad idea ... yep ... in fact this is the worst idea ever [18m.54s]

ALBERT – the fact that it's awful

JEFFREY – why ... this is it an awful idea?

ALBERT – I think something you're talkin about ... the fact that you told us about it

JEFFREY – I aint goin back

ALBERT – Well I'm already there

ALBERT – oh, oh.

Albert demonstrated increased verbal conversation when he played this game with Jeffrey by borrowing from several available designs (written language, visual, and audio).

Albert would read aloud what he visually viewed on the screen frames, such as giving directions and asking questions.

What distinguishes their cultural playing experiences was their interdependence and collaboration. As much as Albert continually displayed flexibility and adaptability to being part of a team and helping others this may have been challenging for him, given his quiet nature.

The ways that Jeffrey developed and shared his meaning-making from his video gaming experiences was quite different from Albert's. Jeffrey's primary borrowing of available designs was linguistic, generally oral storytelling and audio, with a secondary focus on visual, gestural, and spatial representations. At times, the surrounding online communities of practice offered Jeffrey opportunities to share his redesigned meanings with other players. Jeffrey characterized these online communities of practice as online forums, and chat sessions within a video game and social media. For example, through his participation and membership in these various online spaces, Jeffrey actively built his literacy and discourse skills, such as storytelling, listening, critically reflecting, and responding to others with his meanings about video games. I observed Jeffrey focusing more on the background context of the story, questioning why certain events occurred.

Other ways that Jeffrey demonstrated his out-of-school literacy skills was his ability to be a storyteller, displaying his competencies by drawing on the concept of oral language in particular narrative forms for his meaning-making about video gaming experiences. Jeffrey's keenness to play narrative-based games may represent a way for him to reinforce his interest in storytelling. Throughout the study, Jeffrey relied on paratexts for details in games, including the background story, context, and history to situate his learning processes and critically understand the narrative content. When Jeffrey demonstrated storytelling, he primarily borrowed from the oral language modality within the linguistic design (Cope & Kalantzis, 2009). Jeffrey also connected with the environmental storytelling of these types of video games because of their connection to specific genres, such as history.

Except for the one time that Jeffrey played a video game in the video games room at the community centre with the other participant, for the remaining part of the study he did not play any video games. Instead Jeffrey preferred to talk to me about his video gaming experiences he had in the past or playing video games the previous day or night at home alone or with friends. Jeffrey drew on oral language designs. Some of these conversations with him lasted 20-40 minutes on different days. He would talk to me about the video games he had played the night before, discussing their different narrative storylines, and computer game design. Most of the video games that Jeffrey played were narrative-based. Jeffrey was articulate in the way he talked about characters, plot, and ideas. He focused on these preferences in his choice of video games. He did not appear to play puzzle platformer video games like Minecraft, or Portal 2 for problem-solving and strategy. Jeffrey explained, "Portal 2 ... it's a puzzle game. So it sort of helps them in solving problems." This general, random comment about puzzle games suggests he was clear in his narrative game preferences, viewing other games as no value in contributing to his own multiliteracies needs. His comment may be a reason he distances himself from the game players who played video games at the community centre, by attaching the word "them" in his reference to problem-solving games. This notion is reinforced by Jeffrey attaching more importance to building knowledge by comprehending the interplay of characters and how they are situated in the background story.

One of the video games that Jeffrey spoke of in detail and exhibited emotion in was the video game *Never Alone (Kisima Innitchuna)*: "No, not unless it is the game I said, *Never Alone*." Jeffrey was persistent in his support and interest of this video game and eventually began to interact with other students to ask them to play it with him. In some ways, Jeffrey revealed his subjectivity and interests in his experiences with this video game. Clearly, Jeffrey's focus on oral verbal skills as a stimulant for his learning demonstrated his reliance on the brain's left hemisphere (verbal, reading and writing) for his meaning-making and less on the right hemisphere for spatial learning (visual moving pictures).

Jeffrey demonstrated his cultural knowledge by relying on paratextual information. His review of game developer research may be how he determined authenticity for the Alaskan culture embedded in the video game *Never Alone (Kisima Innitchuna)*. In his

designing process, Jeffrey made use of the dynamic interplay of visual and audio representations by actively engaging with the video game embedded authentic video elements. He explained, "Parts of the game *Never Alone* ... Cultural insights ... these little videos you would watch ... Elders come up to a camera. They would be interviewed by the developers ... They would talk about like their stories ... They would talk about the wisdom, the Elders". Jeffrey made meanings by shifting between available modes in the video game, such as listening and watching the Elder videos between the gameplay sequences. His experiences in playing these types of narrative-based games also suggest that he is a strong reflective thinker, weaving and developing his cultural knowledge along with understanding other diverse cultural identities.

Jeffrey sometimes interacted with others by observing their video gaming practices as a critical spectator. Often Jeffrey's reactions to other players demonstrated the ways he filtered video game content. While observing someone playing the adventure video game *Half-Life 2*, one of Jeffrey's comments included, "why do you want to kill the Vortigant with a crowbar? The Vortigant is the most peaceful creature." From his observations of others, Jeffrey made meanings by often borrowing from oral language, audio, and gestural representations. Sometimes he would subvocalize his disapproval and critique of others' gameplay sequences, combining his critique with facial expressions. His comments also suggest the ways in which he was developing critical literacy skills such as close-reading, reflectivity, and rejecting violence, in the way he analyzed and understood video games, interplay of characters, and storylines. In Jeffrey's interaction and analysis of video games, he appeared to find meaning based on his values and perspectives.

Jeffrey preferred video games that contained visual representations of historical events thus, he associated his meaning-making with historical war events when he selected adventure games, such as the *Valiant Hearts: The Great War*. Jeffrey made meanings about world events, suggesting a level of complexity and connection to real world situations embedded in narrative games. When Jeffrey played this game, *Valiant Hearts: The Great War*, he explained to me "it's a puzzle platformer and is also story driven, which tells the events of World War one, sort of ... It's not actually based on any real people from the actual war itself." The meaningful experience for Jeffrey may be an

opportunity for him to understand and identify with the social and cultural experiences of people. By playing these games, he developed his cultural knowledge by identifying with historic war events and the lives of people, rather than a video game challenge, such as problem-solving. On many occasions, Jeffrey spoke to me about the reason why he chose a particular game: “Like something as a game as World War I. Anything that inspires me from the game.” Jeffrey demonstrated how he applied his cultural knowledge when he expressed his opinions about video games. He spoke about a game inspiring him, constructively reflecting on the ways the events occurred within the stories.

Beyond his interest in history and narrative, Jeffrey acknowledged that some video games were designed for decision-making: “you also have to make a quick decision-making on it. It’s a lot of decision-making involved. Video games are a good way to deal with those.” Jeffrey seemed to be a detail-oriented person, and making decisions quickly may have been challenging for him. Additionally, he qualified his statement by explaining how games are a “good way to deal with those.” Jeffrey’s comment suggests he was aware that making decisions quickly was a skill he lacked or wanted to improve upon and that the game provided opportunities for him to hone his skills. Jeffrey developed cultural knowledge through his interaction with peers when he talked about storylines and game plots.

For Jeffrey, playing certain types of narrative design games, such as *The Last of Us* and *Valiant Hearts: The Great War*, provided a reason to talk with friends about what had occurred in the plot or the ways that the historical events of the game played out. Jeffrey recognized that these types of video games contained narrative elements, thus offering him opportunities to engage in discussions collaboratively with peers and other gamers online. Jeffrey explained to me,

Yah, I’ll talk about plot with friends. Especially if they played the game themselves, cause of course we’ll both have ... we’ll have questions about the game where always gonna be questions like why did this happen or why did this have to happen? Especially with very emotional events in the games. (Jeffrey, personal communication, community centre case, August 2015)

Jeffrey's explanation demonstrates the ways in which he draws on gestural representations, expressed in the form of feelings and emotions that he experiences when playing this type of game. Jeffrey made meanings through the ways he analyzed the plot, characters, storyline, and emotional historical events.

Jeffrey's reflection illustrated his thought processes and analysis of cultural and historical events. One of the ways that Jeffrey attached meanings to playing these story-driven narrative video games, including *Never Alone (Kisima Innitchuna)*, was how he shared his game playing experiences with others, rather than playing independently. He wanted to talk about the games with others, and it was important for Jeffrey to know that "they played the game themselves" in order to have conversations with them. Jeffrey made meanings and connections through discussing these issues and questions with others as he expressed, "where always gonna be questions." From this comment, Jeffrey draws on oral and audio representations by recognizing his need to share opinions, listen, and discuss ideas. During the study, Jeffrey demonstrated how he made new experiences from video games by asking others to choose these games to play so he could have discussions with them. Jeffrey often communicated this request to others: "well we need to ... we're both gonna use a story-based game. It's not that ... it's that then we got something to talk about it." These comments also suggest that Jeffrey applied critical thinking skills based on video game preferences, seeking out emotionally, and challenging story-driven games. These types of games are not necessarily action-packed but have some significant meaning behind the story, such as the culturally rich game called *Never Alone (Kisima Innitchuna)*, which Jeffrey wanted others to play. This type of game was meaningful to Jeffrey because he informed me that "it's to preserve Alaskan culture" and it showed his understanding of the significance of this game to raising awareness about Indigenous peoples, their traditions, and their cultural identity. Jeffrey demonstrated an interest and awareness of retaining traditions of Indigenous storytelling experiences.

It was not only certain story-driven games or with events occurring within the plot that seemed to engage Jeffrey's steady interest and critical views, but also the characters within those video games. Jeffrey explained, "given I've always played a lot of story driven games before many story driven games before." He would also talk about characters in video games: "Ahhh with characters, I talk about the characters ... it's like

... you know I'll always talk about them." More importantly, Jeffrey often informed me about his position or rather critical analysis of characters within the storyline. These characters signified more than just visual representations to Jeffrey. He viewed how characters interacted within the video game plots to make meanings. For example, Jeffrey explained that "the video game *The Last of Us* ... Bill ... yeah, just put this conveniently placed character that just so happens to know exactly how to solve the problem ... I'll make fun of them in those ways ... I'll sorta nit-pick at it." Jeffrey critically assessed the reason and purpose that characters have within a story, their placement and significance, suggesting his deeper understanding of plots and the genre of the video games he played. In the video games he played, Jeffrey also made use of these visual representations by customizing characters to represent some type of self-image. This customization involved changing physical attributes, such as eye and skin colour, and clothing. Jeffrey's designs of his characters were highly subjective, suggesting his awareness of the ways he shaped his identity within the virtual space.

Jeffrey commented on storylines to understand the interplay of characters and events, and he often analyzed the designs of video games. For example, Jeffrey explained that clustered maps contained within certain games could limit character movement and sometimes caused him to feel isolated. By providing details about the problems with spacing, layout, and character movement design in a game, Jeffrey draws on spatial and gestural representations. Jeffrey viewed these clustered maps as design flaws. Perhaps these features did not support his cognitive skills. Although these maps represented additional complex semiotic features, Jeffrey did not gain any spatial skills from utilizing these features.

During the study, Jeffrey usually relied on storytelling to relate his video gaming experiences; however, a few times he played video games with Albert. Jeffrey relied more on his use of audio and gestural representations. Jeffrey demonstrated this with his physical movements, creating a spatial proximity between himself and the video game elements. He also demonstrated an immersion in the game by openly displaying his emotions, using facial gestures, such as laughing, smiling, and sighing. Jeffrey also made meanings by drawing on audio representations, expressing his gameplay by subvocalizing his reactions to each gameplay sequence.

In this section, I have addressed my overarching research question, “In what ways do multiliteracies (The New London Group, 2000) as practiced by boys through computerized video game technologies and associated networks influence their cultural knowledge?” by analyzing the findings as they related to various modes of meanings found in the multiliteracies multimodal framework (Cope & Kalantzis, 2009). Albert and Jeffrey reveal their meaning-making through experiencing, representing the first of the four fundamental dimensions of the multiliteracies pedagogy (Cope & Kalantzis, 2009). Additionally, the sub research questions b) Do, and how do, video game usage and surrounding networks act as contributing factors to boys’ cultural knowledge and use of literacy skills? and c) Do, and how do, social dynamics contribute to boys’ multiliteracies skills and cultural experiences? were addressed by the remaining three fundamental dimensions of the multiliteracies pedagogy representing conceptualising, analysing, and applying (Cope & Kalantzis, 2009; The New London Group, 1996, see section 2.24). Based on data derived from observations, field notes, discussions with these boys, and semi-structured interviews (Table 4), I represented the practices, experiences, and extended cultural knowledge that was developed, adopted, and shared by these boys.

Multiliteracies theory (Cope & Kalantzis, 2009; The New London Group, 1996) recognizes learning as an active process involving both design and pedagogy. Earlier in this chapter, I discussed the ways Albert and Jeffrey designed their knowledge processes associated with various semiotic activities. These activities were represented by modes of meaning within the multiliteracies multimodal framework (Cope & Kalantzis, 2009). During Albert and Jeffrey’s meaning-making, they also demonstrated how they transformed their knowledge from designing and redesigning to literacy skills through pedagogical acts or ‘knowledge processes’ (Table 4), including experiencing, conceptualising, analysing, and applying (Cope & Kalantzis, 2009; The New London Group, 1996). Table 4 represents sample data of the multiliteracies pedagogical acts or knowledge processes that Albert and Jeffrey exhibited while engaging in video gameplay during the study.

Table 4

Sample Multiliteracies Pedagogy for Albert and Jeffrey's Meaning-making.

Experiencing (Known/New)	Conceptualising (Define/Theory)	Analysing (Functional/Critical)	Applying (Appropriate/Creative)
Albert remarks how he plays multiple roles in video games to learn different strategies for each character	Albert and Jeffrey collaborate with each other during gameplay – giving each other directions	Jeffrey analyzes the differences between a novel and a video game	Jeffrey extends his knowledge, speaking about design flaws of games and about history by designing game iPhone apps
Jeffrey and Albert play and help each other as peers – discussing strategies	Albert plays Portal-2 (diagram of video games in section 4.4) in order to help him learn strategy and building	Jeffrey criticizes violent behavior in video games	Albert extends his learning by creating online video demonstrations for video game walk-throughs
Jeffrey enters into discussions about story plot and characters with friends online when playing games	Albert provides online instruction and walk-throughs about video games	Albert plays Minecraft (Figure 2) to increase his analytical skills for other games	Jeffrey refers to story-driven games such as Valiant Hearts: The Great War (diagram of video games in section 4.4) – connected to cognitive functions (emotions)
Jeffrey refers to parts of the game Never Alone (Kisima Innitchuna) (diagram of video games in section 4.4) – called cultural insights representing videos that you would watch –Elders come up to a camera and talk about their stories and wisdom	Albert uses the online community of practice to demonstrate strategy building and theory making from playing Minecraft (see diagram of video games in section 4.4)	Albert demonstrated self-directed learning in the ways he played video games	Jeffrey makes references to Aboriginal knowledge based on his video gameplay – referencing Ojibway language for schools
Jeffrey prefers to have discussions about his	Jeffrey found working with random online	Albert is conventional in gender positioning	Jeffrey's focus on narrative games helps to build his literacy

Experiencing (Known/New)	Conceptualising (Define/Theory)	Analysing (Functional/Critical)	Applying (Appropriate/Creative)
knowledge and experience about story-driven games	players challenging, prefers friends	for characters but sometimes explores different genders from what he normally uses to understand the outcome	skills and how stories are written

4.7.2 Experiencing: In what ways do multiliteracies influence cultural knowledge?

Albert tended to gain his meanings from playing independently; therefore, he did not appear to gain any meaningful experiencing from online surroundings by interacting with online peers or others for directions or instruction. These actions differed when he engaged in video gameplay as a team member. When Albert played a game such as Team Fortress 2, within the surrounding online community of practice, he was a member of a larger group of online players. Albert demonstrated examples of this by the way he multitasked his playing, interacting, and problem-solving, all in a seemingly effortless approach.

I recognized a pattern in Albert's cognitive processes and demonstration of experiencing based on his video game preferences. Albert would generally play the video game Portal 2 when we started our sessions or he would use it in between playing times. His gameplay preferences were an example of how he prepared for experiencing new texts when he was playing a more detailed strategy multiplayer competitive game. This predictable method seemed to be contextual, based on subjective interest, and may have been rooted in Albert's familiarity with his own learning knowledge processes. Albert relied on certain gameplay sequences and game type preferences—perhaps to develop his problem-solving, strategy, and decision-making skill through trial and error in an experiential learning space. Using these types of games, he concentrated his experiencing on specific problem-solving in a game. Part of Albert's process of experiencing was through learning each step completely and making certain decisions for problem solving

or different strategies. Albert's game playing sequences were also methodical and logically determined.

Part of Albert's meaning-making processes included setting appropriate goals for himself, especially when he chose certain video games to play. Goal setting characterized Albert as persistent in his video gaming and meaning-making processes. His reasoning was "to try to get better at them. Helps me to learn and get better." Albert was not specific about how he would apply it to his learning in school; however, it does suggest his desire to challenge himself, being a self-directed learner and having a responsible self-confident attitude. Albert played the games incessantly and his comments indicate his desire to continuously improve on his skills and abilities. These types of meanings became patterns of experience that he could choose to apply in school; however, as this study did not account for those in-school experiences, a future study is planned to explore these phenomena. Moreover, Albert's comment and his focus on game playing strategies suggests that he prioritized his game choices in order to develop his skills. He was also interested in demonstrating his skills to peers.

Albert demonstrated the known and the new by his flexibility and adaptability in the ways he assumed multiple roles and different characters for other video games, such as Team Fortress. Albert borrowed from available sources of designs, such as visual and spatial, to determine different strategies—each taking on new meaning and requirements within the game. For example, when he chose to play a character representing a medic or an engineer, he altered his constructed meaning. By reflecting on his own experience and knowledge, he responded with strategies or problem-solving skills as either character. As an engineer, he would redesign his meanings that were gained from experiences and skills from playing games like Minecraft. In the role of a medic, however, he would construct new meanings based on available sources of visual elements occurring within the video game, or he would bring his own concept of what was required to assume that role.

Jeffrey's video gaming experiences focused on narrative-based games. During my conversations with Jeffrey, he explained a video game's relevance by referring to how the developers had conducted detailed research to integrate an authentic immersive

experience for the players. Jeffrey explained how the video games' authenticity included Elders' wisdom and storytelling through interactive videos accessed and viewed by players during video game sequences. In my conversations with Jeffrey, I recognized how he made meanings about the depth of Alaskan culture embedded in the video game and how a player could make meanings about identity, and traditions through storytelling.

One of the ways that Jeffrey's meaning-making emerged was through his video game preferences specific to these culturally rich narrative-based video games. The video game included real world video streams of Alaskan people combined with the digital game world experience. Jeffrey's interaction with the semiotics in the game may have caused him to focus on different ways of thinking about literacy. He used cognitive functions such as decoding and encoding the meanings from the moving visual images of the video game and from the Elders' wisdom and storytelling embedded in videos. By actively processing the combined semiotics within the video game, he could interpret and anchor his meanings to develop his cultural knowledge.

Rather than simply playing the video game *Never Alone (Kisima Innitchuna)*, Jeffrey took advantage of the cultural insights embedded in the video game by viewing and listening to the Elders' wisdom and storytelling. Jeffrey's meaning-making and development of his cultural knowledge may have demonstrated his awareness of how the Elders' wisdom and storytelling played a significant role in certain events in the plot and in real life. His awareness is evidenced by the example he provided when he explained that if a player was not attentive to the Elders' advice, then there could be repercussions.

When Jeffrey and Albert played together, they demonstrated an exchange of experiences of the known and unknown, with action and meaning-making of combined players. They provided each other with instructions and also engaged in meaningful conversations about the game design, strategies, and paratextual information during the video game sequences. Taking the time to listen and share each other's perspectives, the boys discussed their actions which involved a cultural weaving of experiences. For example, during one gameplay sequence as they collaborated to solve problems, Jeffrey commented on the design of the background colour of the game and the character outfits,

while Albert interpreted in-game texts and paratextual information, such as references to Marvel comic characters within the game.

I noticed that Jeffrey's experiencing did not appear to originate from formal and informal instruction through surrounding online communities of practice. Jeffrey would enter into discussions with friends and peers online about video game storylines, plot, and characters. In his process of designing and redesigning meanings, Jeffrey demonstrated his thoughtfulness by positioning arguments about narrative storylines in games, offering those meanings to others. Jeffrey exercised his subjectivity in his active representation of his meaning-making by sharing his own perspective, insights, and experience with others.

4.7.3 Conceptualising: Do, and how do, social dynamics contribute to boys' multiliteracies skills and cultural experiences?

During their gameplay sequences, Albert and Jeffrey demonstrated a social dynamic between them suggesting ways they were building mental models of each other's play styles, strengths, and weaknesses. They constantly talked and advised one another of strategic plans. While playing the game, Albert and Jeffrey commented back and forth with each other, demonstrating how their collaborative activities seemed to blend both oral commentary and visual monitoring of onscreen images, while protecting each other's characters. When they collaborated using this form of oral and visual support, they demonstrated their gameplay activity with socialized speech patterns in the form of oral discussions (Vygotsky, 1978). Albert and Jeffrey shared and exchanged ideas about different strategies they were using during the video game sequences. They also shared paratexts, such as developer information and references to comic book characters.

One of the ways that Albert demonstrated conceptual theory making was by answering questions carefully and logically. In his actions, he also seemed methodical in the ways he played his video games, building mental models of his own strategies and problem-solving. Albert focused his problem-solving and learning strategies through a video game called Portal 2. For example, Albert referred only once to these point-and-click video games: "Ahhh in this game, ahhh, point-and-click, escape game. You have to ummm get to a certain spot by using ahhh portals and solving puzzles to get them to work." During his video gaming, Albert drew upon a combination of available designs, including visual

representations (e.g., moving images, characters and sometimes background setting) and tactile representations (e.g., constant need for point-and-click movement of the mouse). For certain video games, like Portal 2, Albert demonstrated his control of the video game not as a character but as an object for his meaning-making. Before he played multiplayer competitive type strategy games, he would begin by playing point-and-click, or puzzle maker games. In this way, Albert broadened his learning processes by building mental model skills. This may be why he distinguished between familiar and different strategies needed for other games he played. Although Albert focused less on the setting and narrative plot events, being able to navigate multiple events, locations, and semiotics in a game could enhance his literacy skills to comprehend plot and characters. Albert consistently demonstrated persistence in the ways he organized his self-directed activities until he achieved his goal of learning a task. For example, on one occasion during my fieldwork, I found Albert playing his usual start up video game, Portal 2. While he was playing this game, he was eager to confide in me that he had trouble problem-solving, but that he had figured out the puzzle because he continuously played this video game. Albert provided an example of this theory by indicating, "That's how you do it. I was having trouble figuring that out on my own even over the last few days. I've been doing this wrong. I figured that on my own." So rather than ask for help from other players at the community centre, or consult online help boards to draw on the available community of practice, Albert alternated between the conceptual methods of problem-solving and experiential methods of trial and error. Albert organized and managed his self-directed initiatives, deciding when and which video games he played. By making use of the experiential learning spaces presented in video games, Albert attempted several methods and made meanings until he was satisfied with his learning goals. Albert seemed to carefully analyze every step he took in the video game in order to arrive at the best way to solve a problem or redesign a new strategy. Albert may have played these types of puzzle platformer games in order to apply different knowledge processes. By experiencing these gameplay sequences, he developed skills to be self-reliant in problem-solving.

Albert may have also played different video games to develop his own abilities and expertise. He also demonstrated a keenness to provide others with support. One distinct

way that Albert constructed his cultural knowledge was through socially collaborating with others. He demonstrated this by sharing ideas, such as gameplay, instructions, and walk-throughs in the online community of practice. For example, Albert explained to me that “if they already know how to play I’m just giving gameplays and walkthroughs and stuff like to help them certain parts of the game.” For the most part, Albert played video games independently to learn, but his response also suggests his online participation was for a specific purpose. He viewed these online experiences as a way to share his cultural knowledge with others by talking about his experiences or by teaching others. In this way, Albert was active in his membership within the online community of practice.

Albert often spoke to me during our conversations about spending time with friends when they played online games to show them how to play the various video games. Albert used the online community of practice to demonstrate strategy building from playing the video game Minecraft. His play style and membership in the online community of practice also suggest that he did not gain formal learning from his online membership, but rather he used these opportunities to be an active theory maker by sharing and exchanging new information. According to Albert, he would play Minecraft, often “alone when my friends aren’t on, because that way when they do get on I casually show them what I made.” References to video demonstrations and game walkthroughs are examples of how he applied his theories by sharing them with others. Albert’s willingness to show others what he learned demonstrated his confidence in his own skills and abilities. Giving gameplays and walkthroughs was how Albert extended his own cultural video gaming experiences with others. Albert would spend time playing certain video games, such as Minecraft or Portal 2, so he could solve problems and then share these skills with others.

Jeffrey found that working with others was somewhat challenging, especially when he played with random online video game players. He asserted, “like I try to work with them, I try super hard to have them cooperate but it never works.” Jeffrey’s participation in the online community of practice was as an active theory and meaning maker, wanting to have discussions with random players. Jeffrey maintained his online role consistently; however, he did not recognize a positive outcome from working with random players, or even as a means to train others. Jeffrey’s comment suggests that he preferred to play video games for building meaningful contributions about stories or sharing ideas, which

is perhaps why he felt he could not collaborate with players he did not know. Instead, Jeffrey found meaning from playing video games with friends, finding his place within familiar territories. Jeffrey explained to me, “with friends, you know them well, you can cooperate with them.” Jeffrey organized his storytelling and cultural knowledge by affiliating and collaborating with friends. This suggests that Jeffrey focused more on building lasting relationships with friends, perhaps creating meanings and discussing personal thoughts or ideas; however, he indicated that these relationships would be difficult to build with random online players.

4.7.4 Analysing and applying: Do, and how do, video game usage contribute to boys' cultural knowledge and use of literacy skills?

Part of Jeffrey's cultural knowledge, gained from his video gaming practices, was how he qualified his comparative analysis of narrative type video games and print-based novels. According to Jeffrey, “video games are interactive, they make it a lot more fun that way. And for some games you can even change the story based on what you do ... based on choices that you make. Meanwhile with novels it's ... it's the same linear story every time.” Rather than read a novel, Jeffrey's approach was to immerse himself into the game experience. Based on Jeffrey's perspective, novels are limited in their engagement of a storyline. Jeffrey's preference was to gain knowledge and literacy skills by demonstrating his use of alternative texts such as non-linear interactive video games. Jeffrey gained his cultural knowledge through his critical evaluation of novels, and innovative and creative video gaming interests with narrative-driven video games. His preference for narrative video games also provided him with opportunities to be creative and change a storyline based on his perception of storyline events and outcomes. He knew he could not do the same with a physical paper book. He clarified his opinion about this when he told me,

You can interact with the characters...you can go up to them, you can ask ... they'll spew out a line of dialogue –and then some of them tell some of the things going on around you – it's like you sort of get more of what's happening you can understand a lot quicker than you would with a novel. (Jeffrey, personal communication, community centre case, August 2015)

This comment suggests Jeffrey gained his cultural experience by using video games that included both interactive elements, the ability to change storylines, and narrative-driven plots that were of interest to him.

Jeffrey demonstrated his critical ability by criticizing violence in video games and reviewing different video games, comparing narrative ones to puzzle platformers and traditional novels. During the study, Jeffrey would be a spectator and observe other players' video gaming experiences at the community centre. He would often vocalize concerns by evaluating other people's motivation to play. At one point, Jeffrey remarked to players when he observed them playing a video game called *Half-Life 2*: "Why do you want to kill the Vortigant with a crowbar ... just lay offff, no anger." When Jeffrey chose to identify this play sequence as violent behavior, he applied his own perspective by interrogating the actions of another player.

Jeffrey demonstrated his critical analytical skills by making logical and textual connections between the player's single action of using a crowbar and an angry behavioral trait. Jeffrey made meanings and developed knowledge processes, illustrating his reasoning skills. This example may also represent how he moved from his prior knowledge of the game to new concepts. Jeffrey applied his prior knowledge and perceptions about characters and storylines by identifying Vortigant as a peaceful character, and also his analytical evaluation of another player's motive of using a crowbar as associated with angry behavior. Jeffrey's comments demonstrate his rejection of forms of violence and violent behavior. In this instance, Jeffrey observed the peer's gameplay and openly confronted, identified, and challenged their behavior, rather than passively overlooking the actions.

During conversations with Albert, he explained to me that he would often play the video game *Minecraft* to enhance his analytical skills and mathematical logic through building in games. According to Albert the video game *Minecraft* offers players opportunities: "like, um, you can build castles, houses." He would play these games independently and then demonstrate to others what he learned.

At other times, Jeffrey utilized his analytical meaning-making by reflecting on various developers' video game design flaws. He told me that he analyzed tiny details about plot events and characters. For example, in one of our conversations, Jeffrey explained the video game *The Last of Us*. In this game, he criticized how a character named Bill was conveniently placed into the plot just to solve certain problems. Jeffrey's meaning-making demonstrated how he practiced literacy skills by critically framing his understanding of the plot and character connections. Jeffrey constructed meanings about the character by identifying how it seemed out of place for this game's storyline. This suggests he used his cognitive reasoning skills to explain the patterns of text, and at the same time demonstrated his literacy skills through his understanding of the video game content. Jeffrey said, "of course there are the bigger details you can sort of break that down into smaller bits and you could make fun of those little tiny bits that make up the major parts." This comment represents how Jeffrey demonstrated analyzing narrative elements within a game. By criticizing these narrative elements within the video games, Jeffrey extends his playing experience by applying his skills in a meaningful way.

By Jeffrey drawing inferences about these characters, he demonstrated his understanding of the functional relation between the cause and effect of characters within a plot sequence. This is how he demonstrated his literacy skills—by making meanings about the contextual significance of the storyline, then linking background experiences to new experiences to gain knowledge. Jeffrey demonstrated his cognitive awareness of the interplay of events and characters based on his interrogation of the video game's design. Jeffrey also demonstrated his literacy skills by making inferences and drawing conclusions about characters and his keenness to follow the storyline. The way Jeffrey arrived at conclusions about the unrealistic role and placement of the character represents his ability to differentiate between the meanings he gained from playing the video game and real world contexts of his everyday life experiences.

Albert demonstrated self-directed learning in the ways he played video games independently. He would often play a video game such as *Portal 2* (Figure 2) prior to playing other video games in order to challenge himself in problem-solving and analysing. Rather than seek help from peers or other players from the surrounding online networks. Albert's persistence in his learning and knowledge processes by independently

working on problem-solving until he achieved his goal. In his meaning-making knowledge processes, Albert also demonstrated operational literacy skills (see definition of terms in section 1.7). Operational literacy skills represents how adolescents read both visual and print textual instructions, and use and adapt semiotic systems to meet their needs (Sanford & Madill, 2007). He demonstrated skills such as reading for meaning and predicting when he played certain narrative-story driven games such as *Half-Life 2*. During game sequences by shifting from one available mode of meaning to another, known as synaesthesia (see definition of terms in section 1.7), he made meanings about themes, plot sequences and significance of characters influenced by conflict within the plot. He interacted with the semiotic systems embedded within the game by reading the character on-screen text, watching the visuals, listening to the music and playing the game sequences as certain characters.

Throughout the study, it was clear to me that Albert was conventional in his gender preferences for video game characters, although I cannot speak for any video gaming practices outside of this study. During the semi-structured interview, Albert expressed his interest and motivation to explore other genders in video games. Albert's thinking process was to understand if the outcome of a plot would change using a female versus a male character. Albert explained,

Like with me it wouldn't really matter cause there's different ways of playing the game, especially with different types of characters, there's always like different abilities in some games that you can't get when you're either the guy or the girl so really ahhh ... matters when I play cause I would either ... ahhh choose like either gender. (Albert, personal communication, community centre case, August 2015)

This comment suggests that Albert was developing a chain of reasoning by considering new concepts and re-evaluating his own gaming practices to explore a cause and effect association between the two genders (Cope & Kalantzis, 2009). Using video games allowed Albert an opportunity to explore different gender constructions in a virtual space without having to navigate peers policing his choices. Micro cultures can shape identity, so Albert's exploration of different genders in video games is an example of how Connell

(1996) found that boys' masculinities are fluid. Albert acknowledged how each gender had a certain purpose within a game, such as qualities and abilities. He does not view one gender as dominant over another, but alternates between the genders in order to benefit in the game. Albert's actions and comments demonstrated his explorations of multiple masculinities in his gender choices: "cause it's like I'm fond of trying ... to try different things ... and see what it would be like." Albert interrogates the meaning of his own gender positioning to explore the nature and qualities of a different gender, at least within the context of a virtual game space.

Jeffrey extended his cultural knowledge by his interest in video game design and history. In our conversations, Jeffrey shared that he was enrolled in a game design program which enabled him to create "little iPhone games ... little apps." The "apps" related to video games about history, another interest for Jeffrey. Jeffrey had knowledge of game development evidenced by his skills and expertise in critically evaluating video game design flaws. By extending these skills, Jeffrey was transferring and extending his prior knowledge to create new concepts (Cope & Kalantzis, 2009). Jeffrey's activities resembled concrete ways to build on his metacognitive skills by relying on spatial logic and graphic computations in a video game, then further translating those into tangible skills with game design (Cope & Kalantzis, 2009). He explained, "I already know how to work with the console, the game engine, the source engine, I know how it works." Jeffrey was transferring his prior knowledge of analyzing design flaws in games and combining this knowledge with his interest in history within a new learning environment to test real world situations.

Albert also found significance in his experiences to teach others, perhaps to gain satisfaction from this and a sense of achievement. He candidly explained to me, smiling, "I use a videocam and YouTube all the time ... like teaching other players how to play the games and using strategies. I don't write but I create instructional videos through YouTube." Albert demonstrated his strength in working with others by expressing how he teaches them. Rather than just play the game, finish, and move onto playing another video game, he would hone his skills so that he could show others. Albert showed others gameplays, not so much with an arrogant attitude, but with a desire to teach. Albert demonstrated how he applied his knowledge and understandings gained from his

experiences by sharing it with others in real world situations (Cope & Kalantzis, 2009). He also showed how video gaming is a dynamic and social practice by the way he produced meanings and actively mentored and facilitated instructions with peers in the online community of practice. In this way, Albert was an active concept maker, extending his skills with peers or any random players online.

Many times, Jeffrey referred to a video game called *The Last of Us* to convey his cultural terms: "It's in the game ... sort of mixes emotional storytelling along with great gameplay." Jeffrey's reflection refers to the emotion built into the video game but does not diverge too much from his common or preferred experience of storytelling. He also makes further connections to emotion-based stories in his explanation of his experience playing *Valiant Hearts: The Great War*, another historical based adventure video game. According to Jeffrey, "there's quite a bit of emotion in that game that was probably the last time I've ever had ... like emotion for a video game." Jeffrey's experience in playing these adventure games contributed to his interpretation of visual images, characters, and the storyline, which he associated with a range of cognitive functions—learning and emotion. This suggests video games are only meaningful to him if he can be inspired by them. He also focused on having dialogues with friends and contributed meaningful questions about the experiences he encountered when he played these particular video games. Jeffrey built his cultural knowledge in the way he made sense of his video gaming experiences by sharing ideas and questions with others.

Jeffrey demonstrated his own perspectives on culture in his meaning-making comments: "Yeah ... I know I just love the basic idea going from a native's perspective." Many of his comments were related to the video game he played called *Never Alone (Kisima Innitchuna)*. He was often persuasive in his conversations with me about his ideas to promote and implement Ojibway language in the school curriculum. Jeffrey applied his creativity from his perception, cultural knowledge, and understanding of the complex diversity of this game to apply it to real world situations by suggesting integrating the language in school curriculum. He did not self-identify as an Aboriginal, but appeared to have extensive knowledge of this culture by making frequent references to its relevance. This also suggests that Jeffrey is knowledgeable of other cultures, specifically First Nation communities, and the fact that these cultures need to be preserved. Jeffrey did not

self-identify as an Indigenous person but did demonstrated his informed knowledge about Indigenous peoples, spoke passionately about the culture and the need to respect diversity in a community.

Jeffrey made meanings from stories and storytelling. His meaning-making activated cognitive functions, such as language and speech, and contributed to the ways he gained knowledge and communicated socially with others (Vygotsky, 1978). On several occasions, he would explain to me, “so you sorta learn about how all stories are written. You learn about that which could help with literacy, I guess. Cause with literacy it’s all about stories” and “anything that would inspire me is like story-driven games.” The ways Jeffrey found meanings from video gaming practices was by associating literacy with narrative or story-driven games. Jeffrey explained how some video games were structured: “Gameplay goes along so does the story. Each individual level is like a city that you’re going through or some sort of area in the country that you’re going through to get to wherever you need to go.” Jeffrey conceptualizes the game as a journey. His ways of making connections with the multiple semiotic system within the video games represent his knowledge designing processes. Jeffrey’s explanations had colour and creativity, like a story, evaluating the game elements in terms of a level as a city or society within a storyline where characters live and interact, not just as surface level technical graphics or competitive aspects of a game designed by the game developer.

This section has covered how Albert and Jeffrey explored their cultural video gaming experiences at the community centre. In the next section, I introduce the after-school video club where I met Mike and Brian, who shared their cultural video gaming experiences with me.

4.8 After-school video club cases: Mike and Brian

For the after-school video club case, my overarching research question “In what ways do multiliteracies (The New London Group, 2000) as practiced by boys through computerized video game technologies and associated networks influence their cultural knowledge?” is addressed by the various metalanguages or modes of meaning that Mike and Brian drew upon during their designing processes. I have identified these modes of meaning in the data (based on observations, my own field notes, discussions with the

boys, and semi-structured interviews) by selecting a sample of the data and mapping them into the multimodal framework (Cope & Kalantzis, 2009). My research question, along with sub questions b and c, is also addressed by the multiliteracies pedagogy, (Cope & Kalantzis, 2009; The New London Group, 1996) in the sample data (Table 6) to represent the practices, experiences and extended cultural knowledge developed, adopted, and shared by the boys. The following section outlines the sample data of meaning-making for Mike and Brian in the after-school video club case. I present the domain of themes related to this setting by presenting the findings in two parts through a multiliteracies lens. The first part considers the designing processes through which Mike and Brian made meanings in their video gaming practices (Table 5). The second part considers the peer mentoring, collaborating, and developing of cultural knowledge based on the pedagogy (Table 6). This mentoring represents a demonstration of formal and informal instruction or ways they participated in their community of practice.

4.8.1 The surroundings at the after-school video club.

Near the end of October 2015, I arrived at the school around 10:30 a.m. The office secretary of the school greeted me when I arrived. I explained that Milly, the teacher supervising the video club was expecting me. Milly greeted me and we headed over to the video club. She told me a number of students had approached her asking when I was coming back as they were eager to be involved in the study. For the after-school video club, I chose only two participants, Mike and Brian. I based my choice on their survey responses about their interests in narrative story-driven games and narrative qualities in video games.

Upon first arriving and throughout my fieldwork at this after-school video club, I observed a fun and welcoming environment. The teacher, Milly, monitored the club by opening and closing the room and authorizing the use of the two television sets and large screen for the games. Milly was always present in the room. Even though teacher presence was strong, this after-school video club lacked the type of regulation and authority normally associated with a school environment (i.e., kids quietly seated and following lessons) (Mac an Ghail, 1994). Instead, the boys could jump up and down with uncontrolled excitement or emotion and dance around without regulations of school rules.

Sometimes while the club kids, including Mike and Brian, were playing the video games, other kids would peer in through the doorway but hesitate to enter the club. Milly's reaction was usually to walk over to the doorway and out into the school corridor to invite the students to join the club. Sometimes one or two students did enter—others did not. Even though the teacher, an authority figure, monitored the club, she did not exude authoritative monitoring. During Milly's monitoring, the kids had fun, yelling, and jumping up and down. While conducting my observations, at no time did I witness any form of classroom management practices, such as the teacher telling the kids to sit in their places or to be quiet. The room, at times, was at capacity with more than 50 kids from Grades 9 and 10. The din was loud but friendly, and it appeared to be a safe community for the kids to play and have their lunch. Both girls and boys were members of the after-school video club, with the majority being boys. The ages of the boys ranged from 14 to 16 years old.

The overwhelming number of members of this club was a testament to its popularity within the school. This space was a classroom converted during the lunch hour to accommodate a video gaming club. When the two large television sets were wheeled in on rolling carts, the kids converged in a race to occupy the best spot in front of these television screens to play and/or be a spectator. One computer situated at the far side of the room belonged to the teacher; however, kids seemed to sense that this was a “no-go” zone. There were no formal chairs or seating areas in this video game club, other than the desks (30 sets of desks) uniformly spaced in the room. Because of this somewhat crowded space, there was only about 10 inches between the television screens and the desks. Furthermore, since this area was an alternate space for a classroom, the kids maintained the order of the room. The desks, organized in straight rows, were not to be moved; only in this sense did this room symbolize a highly-regulated area.

Generally, before the classroom opened for after-school video club, the kids would line up in the school's corridor, outside the doorway of the classroom. The kids eagerly waited outside of the classroom for the teacher to open and unlock the classroom door. Once Milly unlocked the door, the classroom again transformed into a video club. The students preferred to stand around each other in clusters while playing the video games in what seemed to be an unstructured environment. They either sat on the desks huddled

together or stood close together with little space between them. Other members, girls or boys, stood closely behind the video game players to catch a glimpse of the activity or wait for the opportunity to play the next video game sequence. This room did not resemble an individualized gaming arena like the one in the community centre case, but rather a very friendly club atmosphere. This suggests that this particular teacher and perhaps the school had created a safe place for these kids to come together, eat their lunch, and enjoy playing video games.

Super Smash Bros. Melee appeared to be the favoured video game played by these adolescent boys at the after-school video club. The boys did not appear motivated by competition to play this game, but rather by socializing as it was a very friendly environment and players often stopped to help each other. I noticed that it was a fun atmosphere, where the competitiveness was low key or non-existent, compared to the community centre, which often exhibited boys playing video games independently with less of a community atmosphere. The boys in the after-school video club frequently interacted with each other. They huddled together in very tight physical spaces—almost as a safety net to each other, without focusing on their collaborative strategy. There did not appear to be any negativity among them in terms of behavior, words, or actions. Unlike the findings of Mac an Ghail (1994), Connell (1996), and Lingard and Douglas (1999), there seemed to be an absence of negative identity behaviors in the interactions of the boys even though this after-school video club included a large number of peers within a somewhat unregulated space. They seemed to be very relaxed as suggested by their facial features and interactions with each other.

Some teachers who came in as spectators did not seem overly pleased or accepting of the club. The students easily overcame any disapproving gestures from other teachers and continued playing their video games. This relaxed behavior of the students suggested this was their space, similar to the cafeteria. In addition, the boys, Mike and Brian, along with others, would speak very loud and this noise was combined with the sounds and music from the video game. When the hour was finished, this fun and relaxing after-school video club atmosphere returned to the familiar school regulated space. The teacher, Milly, gave the 5-minute signal to end the games and clean up, as the room was to be left in the same order as before the kids had entered.

4.9 Multiliteracies: Use of modes of meaning in designing processes in after-school video club cases

Table 5 represents sample data of the multiliteracies modes of meaning expressed by Mike and Brian as they engaged in their video gameplay. The multiliteracies modes of meaning include Linguistic, Visual, Gestural, Spatial, and Audio.

Table 5

Sample of Available Designs for Mike and Brian's Meaning-making.

Linguistic (written and oral)	Visual (moving images)	Gestural (includes tactile - feelings)	Spatial	Audio
Mike regularly writes on a massive database called a website Smashboard	Brian refers to detailed graphics, atmosphere and the tone in video games which he finds really appealing and interesting	Mike openly gestures, smiling at peers, cheering during gameplay	Mike prefers to play the adventure games. Interact with characters and making decisions to change storylines	Mike explains strategies and character types, technical, sound effects, to help peers
Mike has developed his own coding language to represent play strategies when playing in teams	Mike describes how he changes the colour of his characters depending on how he feels – uses a blue colour to feel calm	Brian mirrors his game playing with gestural movements	Mike goes out to weekly video tournaments to build relationships with other video gamers	Mike prefers playing weekly with friends face-to-face to talk about games and other subjects
Brian writes about games to expand on creative ideas and to get his point across about the video games he plays	Brian focuses on the visuals, music and the storyline for better experience in gameplay	Brian shares positive moments, excitement with peers.	Brian indicates peers are the best training partners, because he refers to it being situational	Brian talks to friends and online players, about characters, plot, strategies – using audio on-screen dialogue exchanges
Brian and Mike play Undertale (diagram of	Brian specifically focuses on visual characteristics –	Brian often examines the movements and mechanics of	Mike interacts with backgrounds, settings and	Mike repeatedly uses sound gestures throughout his

Linguistic (written and oral)	Visual (moving images)	Gestural (includes tactile - feelings)	Spatial	Audio
video games in section 4.4) which includes interaction with characters using symbols and text messages	choosing female characters	characters before he chooses them.	characters – making decisions about placement, whether to stay in an environment	gameplay – reacting to the gameplay and what other players do during a game sequence
Mike enjoys playing Legend of Zelda, an interactive game, characters ask players questions in text on the screen	Mike chooses animal characters, such as fox over masculine type characters – describing details of how they look	Mike understands the details of character mechanics, sometimes stops games to demonstrate to peers	Brian explains he prefers games in an interactive environment - allowing him more freedom to explore and be creative with the story and characters	Mike indicates how he uses audio options in interactive games to talk to characters and ask them questions

4.9.1 In what ways do multiliteracies influence cultural knowledge?

One of the ways Mike constructed meaning was through regular online interactions with a forum website for his preferred video game Super Smash Bros. Melee. Mike demonstrated his participation and membership in the online community of practice by the way he borrowed from the linguistic designs (Cope & Kalantzis, 2009) by writing and responding to questions in the forum or reading responses to questions written by other players. Mike explained,

I mean, there's a website smashboard, again going back to Melee cause that's the game I spend most of my time with, ummmm, it's just like a massive database, and like there's a bunch of forums and stuff where you can if you have a certain question about say a move or something and you can just ask other players and hopefully they can answer you.

(Mike, personal communication, after-school video club case,
November 2015)

In his process of designing ideas and strategies about different character moves within these games, Mike appeared to gain some formal instruction from his membership and interactions with other players in the online community of practice. Mike constructed his meaning-making partly through his online membership. This demonstrated the importance Mike placed on learning about the game through social and collaborative online interactions in peer-based forums.

Mike often demonstrated meaning-making at a metacognitive level through his understanding and insights gained from paratextual information. Mike commented, "Melee is like, there's actually like a documentary on it ... it's over 4 hours long, yeah it's really, really an elaborate game. It's actually hard to explain, it's one of the most technical games in the world." He referred to Super Smash Bros. Melee's documentary written about how players developed strategies. By actively drawing on these resources, Mike developed different perceptions about the game, thus creating new meanings and experiences.

Mike developed his own coding language to represent play strategies when playing in teams. This was evident when he explained to me how he attended weekly meetings to play in Super Smash Bros. Melee tournaments: "But at the beginning like once you just like ahhh get assigned to your partners and you have like thirty seconds to quickly make a plan, we've kinda developed our own language." Mike's comment reflects the ways he used his video gaming experiences to learn actively and gain knowledge from peers through developing language codes and speech. Mike's language development is an example of Vygotsky's (1978) reasoning that children use signs and words as the most important means of their social contact to communicate with others. This language development also highlights Mike's flexibility and adaptability skills, as well his responsiveness in video gaming tournaments, especially those involving high pressure, with only seconds to develop a plan and language in which to communicate. Mike's comments also illustrate how his cultural gaming experiences involved resourcefulness and effective communication skills.

In a different way, Brian constructed his meaning-making by creatively writing about video games. Although Brian commented that he was not a huge writer, he actively borrowed from the written language representation to convey his ideas. Brian explained,

If it gets my point across then sure it's fine ... if I'm writing about a game it's just in place of talking about a game with someone else ... I'd like to expand on an idea about the game or create new works based on the game but it's just a means of conveying what I think of the game to other people. (Brian, personal communication, after-school video club case, November 2015)

This comment reflects how Brian demonstrated his literacy skills by writing ideas about games and representing meanings to others. Brian transformed his designing process of learning by redesigning his ideas and meanings through written language. Brian also understood the purpose of separating these modes of communications, which may suggest that he recognized how literacy skills, such as writing and talking, are interrelated. Brian revealed the way he represented new meanings to others by expanding and creating new ideas about the video games he played. In this way, he was not just transmitting information, but re-representing and re-designing meanings by using his own perspective and imagination.

One of the ways both Mike and Brian gained video gaming experiences was from playing an interactive adventure video game called Undertale. This game invites players to interact with characters through text and symbols, providing players the ability to alter outcomes within the game's storyline. While playing this game, Mike and Brian both made use of the various semiotics represented by the dynamic combination of written text, symbols, and visual representations found within the video game to transform new meanings and build different storylines/narratives. Brian and Mike drew on their literacy skills of understanding the plot, storyline, and characters and used the textually produced interactions as a way to construct meaning and define their narrative outcomes. Both Mike and Brian interacted with the game as designers, redesigning the outcomes based on their imagination and own perspectives. They interpreted ideas using the multilayered, intertextual components of the video game Undertale. The interrelations of text and

visual images embedded within this type of interactive video game form part of a multiple semiotic system that learners, such as Mike and Brian, rely upon in their knowledge designing processes (Cope & Kalantzis, 2009).

Mike demonstrated further ways of navigating the various semiotics, visuals, and text, within a game called *Legend of Zelda*. Mike actively borrowed from visual, tactile, and written language representations in his meaning-making processes. Mike's experience with this game was to interact with characters and answer questions using the keyboard strokes for text messaging. In the video game, the characters interact with the players through this written representation on the screen. Active knowing and learning for Mike emerged from his use of synaesthesia moves, his ability to alternate between the modes of meaning by playing, reading the text, and reacting to the visuals on the screen (Cope & Kalantzis, 2009). Mike demonstrated how he made meanings through a combination of these cognitive processes, such as viewing the visuals, reading, and responding to the text. Mike's willingness to interact with the game through the text messages demonstrated his competency in literacy reflectivity.

Brian referred to detailed graphics, atmosphere, and the tone in video games contributing to the storyline, which he found appealing and interesting. In this way, Brian recognized the complexity of semiotic symbols found in video games. His reflection demonstrated forms of operating literacy. Brian's active borrowing of visual representations within the video game helped him to interpret how detailed graphics in a game could create a certain context, scene, and atmosphere. Brian constructed meanings and interpretations through his design choices such as viewing, reading, and listening. When Brian explained the tone within a video game, he demonstrated his literacy skills related to the author or developer's perspective of the video game.

Mike described how he changed the colours of his characters, based on his feelings. Borrowing from visual representations, Mike customized his characters with different colours to associate with his affective domains, such as his emotion and mood. In his learning process, Mike redesigned the characters to reflect his inner emotions, using colours to create a visual associated meaning which represented his mood. His desire to humanize the characters invited others to perceive his ideal identity or mood at that

particular moment during gameplay sequences. Mike's process of designing the characters transformed their identity so they became esthetically pleasing to him, and conveyed a feeling of calmness, thus adding his personal tone to the game playing experience. Mike partially constructed meanings through these redesigned coloured images, which mirrored an emotional quality. Although Mike only qualified his response by indicating that colour was associated with a feeling of calmness for him, this customization of characters may contribute to minimizing distraction in his gameplay strategies. The emotion associated with Mike's meaning-making may also be due to his reliance on paratextual understandings or drawing on prior knowledge about how certain colours are associated with certain feelings.

Brian focused on a wide range of visuals, music, and the storyline for a better game playing experience. Brian made meanings by relying on visual and audio representations to enhance his gaming experiences. His description of the game included symbolic sounds, visual images, and background music, which provided him a way to connect with the game and allowed him to demonstrate a functional or operational literacy by being able to navigate these multimodal elements. Brian represents an active player practicing literacy by decoding and encoding the interplay of the semiotics built into the game. Therefore, this may suggest Brian's cognitive learning processes (viewing, reading, and listening) were elevated in his meaning-making processes as he drew on the combined visual and audio representations.

Brian also borrowed from visual representations by specifically choosing feminine characters in his video gameplay of Super Smash Bros. Melee. Brian's strong preference for choosing female characters may be a reason for his non-conventional attitude towards gender. Brian explained, "choosing characters ahhh has never been umm ahhh a question of masculinity. You probably noticed in fact that two out of the three characters that I primarily play in Smash Brothers are female." Brian's comments showed his gender fluidity in his designing process and he did not appear influenced by video game content offering dominant definitions of masculinity.

Similarly, in his designing process, Mike also drew from available visual representations to choose non-masculine characters, such as a fox or a mouse when he played Super

Smash Bros. Melee. Mike's detailed descriptions of each of the characters, including colours, sizes, mechanics and tools, demonstrated how he engaged with the visual images for his learning processes. Mike explained, "Peetwo is just a series of smaller moves, when I go to Fox it's like nice ... and he has like better tools than both of them." His concentration and understanding of each of the characters may suggest his operational literacy skills at work. In this way, Mike made connections and relationships in his learning processes, such as close reading of a character image and the tools associated with each. Confronted with various characters and options, Mike took the time to understand each character, relying on the multimodal elements offered in the game and borrowing from visual representations. Mike effectively became an agent in his meaning-making process by choosing characters that were relevant and productive for his play style.

During the times I observed Mike at the after-school video club, he consistently and openly demonstrated his active borrowing of gestural representations, such as smiling, clapping, and cheering during gameplays. When he interacted with his peers, Mike openly exerted his subjectivity, displaying his nature and behavioral traits during his video gaming experiences. His behavior did not resemble a toxic stereotypical masculine behavior (Connell, 1996; Lingard & Douglas, 1999; Mac an Ghail, 1994), but rather represented the socially situated nature of video gameplay, including collaborating, relationship building, and bonding.

Mike appeared to immerse himself in the gaming experience by expressing cognitive-social interactions, such as emotion. Mike openly gestured in his meaning-making process, representing the way children make connections by thinking independently and learning socially (Vygotsky, 1978). His actions and meanings developed in part from the video game by socially collaborating, redesigning, and transforming into gestural movements. In this way, the after-school video club provided a flexible open and accepting space for the boys to express their nature, such as acting out emotions and gestures associated with their gameplay experiences.

Similarly, Brian drew from these same gestural representations, illustrating his dynamic movements, such as jumping up and down, dancing in a circle, and sharing moments with

peers. When he played Super Smash Bros. Melee, he demonstrated an operational literacy and mastery of handling the character movements on the screen. When Brian played the video game, he would often demonstrate his understanding of a character's animated design by instructing it to jump or perform acrobatic movements on the screen. Brian explained "ahhh like I don't really care much about how I look and act ... I'm probably not the most stereotypical gamer ever." Brian's comment reflects the fact that he was not inhibited by his surroundings, mirroring these mechanical movements in the same animated way in the classroom in front of his peers.

Brian actively drew from a combination of visual and gestural representations by closely examining the mechanics of characters before choosing them. Brian explained "I find like a character's design is really, really planned out, then it has some effect but for the most part it's how well, how well their moves, ahhh feel or how mechanically strong they are." Brian's close reading of the dynamic complex layered images and their animated designs demonstrated how his meaning-making involved engaging with multimodal elements, such as visual, gestural, and spatial representations. Brian revealed operational literacy by how he identified strengths and weaknesses in characters and their relational impact to the context of the game and his own play style.

Mike constructed meanings partly by the way he critically reviewed and assessed the character mechanics for the games he experienced. During my observations, I noticed Mike would often mentor his peers about gameplay strategies and characters from Super Smash Bros. Melee. Mike would stop the video gameplay sequence, even during tournaments, to guide fellow peers. He explained the meaning of a particular gameplay strategy and described details of what players viewed on the screen. These descriptions included characters' animation on the screen and the overall mechanical attributes of a character. Mike borrowed from tactile representations to show peers how to physically grasp the console and touch certain buttons in order to manipulate the characters on the screen. Mike pointed to the console and explained how to use it to animate a character in a particular way on the screen. For example, Mike said, "Ok for you to do this you actually just press this one. Literally just press this." Mike had an ability to quickly review and assess characters' interplay of images and their responsiveness to different contextual backgrounds in the game storyline. In this way, Mike appeared to develop his

multiliteracies skills by interpreting these complex elements in the game. He also drew on oral representations to convey those meanings to peers. Mike commented “No, he’s always down it you doing an aerial next time he jumps ... whenever Brian comes down at you, down throw and sidekick, that’s you ... See if you side viewed first then jumped.”

One of the ways I observed Mike and Brian constructing meaning was when they created a circle around themselves during their game playing experiences. They sat close together with peers, suggesting social interactions during gameplay sequences. These actions suggest that Mike and Brian actively borrowed from spatial representations when they played Super Smash Bros. Melee. Sitting in close proximity to each other they overlooked the interpersonal space of competing peers, thus privileging closeness as a sign of friendship or bonding. Mike and Brian would also stop and clap each other’s hands when gameplay sequences appeared to have exciting moments. They did not feel inhibited in their playing or physical space. Social norms, conventions of physical boundaries, privacy, space, and the boundaries related to interpersonal distance did not govern the interactions of Mike and Brian. They huddled together and connected as a supportive peer group. This closeness and connection with capable peers resembles Vygotsky’s (1978) theory of social activity from the zone of proximal development to enhance learning by imitation or demonstration.

Mike made meanings and built knowledge processes from his weekly trips to video game tournaments. These tournaments occurred away from home and school, at a university institution. For Mike, this geographic location became a highly formal space for him to develop his cultural knowledge. In this space, he not only tested different strategies but gained friendships. Mike’s weekly activities highlighted the social experience associated with video gaming, and collaborative learning occurred with friends and other players while reflecting on gameplay strategies. Mike explained that he had initially seen himself as an outsider because he was younger than the university players, but he eventually overcame that self-consciousness. Mike recalled when he attended his first tournaments,

Like normally I would have no reason to be hanging out with these 20-30 year olds playing Melee ... because like me and the others here were

like the youngest smash brothers players there and then I remember they asked like how old are you? (Mike, personal communication, after-school video club case, November 2015)

From this comment, Mike appeared to disconnect from this group of older players and perhaps not consider himself privileged as a full participating member because of his youth. At the same time, Mike seemed to be sensitive to this university space having different associated meaning, such as higher education and interacting with adults, than where he normally played at home or at the after-school video club. Despite that, Mike continued to attend these tournaments, overcoming any pre-conceived notions or barriers about the space. Mike explained, "it's better to actually go out, I go out every week to ahh ... these Melee tournaments that are university ummm and just like you get to meet people ... but because they play Melee it's just something that connects us all." Mike's weekly activities suggested that he identified this location as a place to co-construct strategies, socialize, and communicate in different ways, such as developing a computer language during gameplay sequences. Mike explained, "but at the beginning like once you just like ahh get assigned to your partner and you have like 30 seconds to quickly make a plan we've kinda developed our own language." Mike's comment is a good example of his collaborative activities, often providing him opportunities to be creative and innovative with partners. Piaget (1972) reminded us about how children use a favourable environment in which to exchange information with others. This university space for tournaments appeared to be an inviting social environment, where Mike actively contributed as a member, and provided him with positive reinforcement for developing his cultural knowledge.

Brian's formal instruction and meaning-making appeared to come from his socially constructed video gaming experiences. Brian commented, "If I'm playing a game like Smash Brothers it's better to have, better to have a human, ummm another human to practice against where your peers are the best training partners." Brian also borrowed from spatial representations by physically sitting beside a human partner for his learning processes. Brian's engagement in video games represented a social awareness of expertise and knowledge which he gained by observing, playing, and interacting with others. Brian's comment also revealed that he did not identify himself as a team leader,

like Albert, but rather a collaborator. Thus, when Brian engaged in video gaming, he made meanings by connecting with peers, recognizing them as training partners.

One of the ways Mike constructed meanings was through his preference to play interactive adventure games such as *Undertale*. Mike's experience with this video game demonstrated how he drew on gestural, visual, and spatial representations such as layout, interpersonal boundaries, and territoriality. This game, Mike explained, immersed the player into different worlds and landscapes. Depending on options that the player chose in the game, the character would stay or exit the world with different outcomes played out in the storyline. Mike explained "the game has a lot of decision-making ... it teaches you how to analyze things, say like *Prisoner of Zelda* ... problem-solving." Mike revealed that the game involved different outcomes, such as other characters, within the video game, blocking exits and expecting the player to stay in the particular world or landscape. In playing the video game *Undertale*, Mike recalled his experiences: "I remember how upset I was, she doesn't want you to go back to the human world." Later Mike explained that he read external resources, relying on paratextual information, to determine better decisions for outcomes. He also attributed this experience to developing skills to play other problem-solving games, spatially understanding the complex layout designs of the different worlds, frames, options, and outcomes. Mike recognized how the immersive quality of the game created an emotional connection, thus enhancing his overall learning experience: "so like like a deer saves you ... ummm and just like cares for you ... it's just like it makes you feel really attached to the game." In Mike's designing process, he transformed his meanings, experiences and dynamic play of subjectivities (e.g., his own feelings, decision-making, problem-solving) and related his knowledge processes to other games. *Undertale* was Mike's preference because it provided him with opportunities to reconfigure outcomes in the storyline. Based on designed layouts within the game and different options he chose, he could redesign meanings in the context of the game.

Brian's preference was to play interactive games which allowed him freedom to explore, create, and redesign storylines. Brian borrowed from visual and spatial representations. When Brian engaged with these games, he connected with the characters, interpreted the backstory and interacted with sound, images, and other complex interplays of semiotics.

By engaging with interactive environments, Brian demonstrated his literacy practices through altering the designed elements within the game. Brian's meaning-making with interactive video games invited him to adopt roles, reconfigure meanings and exert his everyday experience and subjectivity. Brian drew on visual and spatial representations by making sense of the video games' background, space, and landscape, redesigning the story based on his view of the world.

Mike also made meanings, built his discourse skills, and developed his cultural knowledge by explaining strategies and character types to peers. Mike mentored peers about his video gaming experiences. Mike developed his cultural knowledge through his game experiences, but he chose to share these knowledge processes with others. Mike privileged the social aspects of gaming by engaging with friends who have common affiliations with learning strategies, decision-making, and problem-solving with Super Smash Bros. Melee. His meaning-making suggests ways he developed out-of-school literacy practices, such as listening, responding, and reflecting on meanings with friends. Mike explained many details about the characters including strengths and weaknesses, and optimal choices to make for certain strategic moves. Mike commented, "Just playing we can practice so I talk about different strategies and stuff." Mike appeared to be willing to forego any notion of competitiveness or being highly private and shared his strategies with peers. Mike's preference to play Super Smash Bros. Melee and the circle of friends he engaged with, who also had the same preference, offered him opportunities to engage in conversations collaboratively while developing his knowledge processes.

Mike preferred to play video games weekly with friends face-to-face so that he could build friendships and talk about games and other subjects. Mike referred to his experiences with friends: "yah I mean just like it's nice to be with your friends ... you get to talk to them, yah, yah like I, I invite my friends over like every week." Drawing from audio representations, Mike privileged his socially situated experiences with friends to support his meaning-making about strategies and oral communication skills. For Mike, playing this game provided him with a reason to meet frequently with friends so that they could discuss their game playing experiences. Although Mike did not say why he attended weekly tournaments at a university, these tournaments may have provided him with new information about knowledge processes to exchange with his friends gained

from the tournaments. Mike's university tournament experiences provided him with alternate learning processes. As a meaning maker, he could redesign those experiences and perspectives to share and transfer those ideas with others as new meanings. Mike's video gaming experiences with friends face-to-face demonstrated how he activated cognitive functions, such as language and speech, as a means to communicate and problem-solve (Vygotsky, 1978). Mike shared his experiences with friends, actively learning and gaining knowledge from each other (Vygotsky, 1978).

Similarly, Brian would talk about characters, plot, and strategies with friends but also with his online community of practice. In this way, Brian was borrowing from audio and spatial representations. Brian explained,

Ahhh I mean collaboration, ahhh strategy I guess ... it's a big part and gets other people to talk a lot about strategy an what we want to do next time ahh ... we go to weekly tournaments ... getting better next time, you know ... learning about the game and ahhh how we can do better ... and how we can finally learn about strategies about players we've having trouble beating. (Brian, personal communication, after-school video club case, November 2015)

Brian's experiences from the weekly tournaments he attended provided him with opportunities to advance his knowledge processes. By making connections and building relationships with other players, novices or experts, Brian demonstrated his resourcefulness by relying on external sources to frame his meaning-making experiences. The weekly tournaments for Brian became an experiential learning space to actively construct meaning and engage in rich collaborative interactions to develop complex problem-solving skills. Brian identified the tournament as a place for him to learn strategies from other players.

Mike repeatedly talked throughout his gameplay, reacting to the gameplay. Mike appeared to develop his learning processes from talking and subvocalizing with different sound gestures during his gameplay sequences. Based on this, he actively borrowed from audio representations during his gaming experiences. I also observed Mike conversing

with other players even when it was not his turn to play. Sometimes he would give an oral account of the play sequences he observed on the screen. Most times, Mike would talk to players to provide them encouragement, feedback on their strategies, and overall support. Mike's oral meaning-making was often a way for him to represent meaning to himself by reinforcing his own perspective and ideas. These vocal actions also suggested ways that Mike publicized his beliefs and values in a social setting. Mike subvocalized and exhibited verbal activities, providing ways for him to engage and interact with others in a way that allowed him a pathway to share his cultural knowledge.

Although Mike's activities were highly social and collaborative, he also drew from audio representations by playing certain video games like *Undertale*. Mike explained,

That's why the game got so famous, it's not skill based or anything like that ... It's like you're talking, you can go up to someone and press say and you can talk to them and answer their questions individually. Yeah and like there's lots of options depending on what you do and what order you do them in. (Mike, personal communication, after-school video club case, November 2015)

Rather than just focus on the visual images embedded within the game and follow the storyline, Mike took advantage of options to interact with the characters to enhance his video gaming experiences. Mike's engagement with this video game demonstrated his literacy skills and an example of his ability to navigate the interplay of multimodal elements while playing the game. In this way, Mike demonstrated synaesthesia (Cope & Kalantzis, 2009) through the way he made meanings focusing on various backgrounds, characters, decision-making, and solving problems, and by talking to other characters through the design elements within the game. Mike engaged with all of the video game's complex elements to give him a compelling interactive experience and support him in his knowledge processes.

Although Mike generally relied on speech and words for his learning processes, his listening skills were equally important. Listening skills are a key part of the meaning-making process according to The New London Group's (1996) and Cope and Kalantzis

(2009) multiliteracies theory of redesigning instances. Mike made meanings through active listening skills based on the ways he organized ideas and thoughts, and critically reflected on options when he interacted with the characters. His actions reflected his overall ability and responsiveness with strategies and decision-making. The way Mike interacted with the game's various embedded semiotics, such as sound, images, movement, and speech, demonstrated his ability to read, listen, choose, process information, and redesign his meanings.

In this section, I addressed my research question, "In what ways do multiliteracies as practiced by boys through computerized video game technologies and associated networks influence their cultural knowledge?" by analyzing the findings as they related to various modes of meanings found in the multiliteracies multimodal framework.

In this next section, my research question is also addressed by how Mike and Brian's meaning-making was influenced by the multiliteracies pedagogy of experiencing (Cope & Kalantzis, 2009). Additionally, the sub research questions are addressed by the remaining three fundamental aspects of the multiliteracies pedagogy: conceptualising, analysing, and applying (Cope & Kalantzis, 2009; The New London Group, 1996). The analysis is based on the sample data representing the practices, experiences, and extended cultural knowledge that is developed, adopted, and shared by the boys. I identify sample data (Table 6) based on observations, field notes, discussions with the boys, and semi-structured interviews.

The multiliteracies theory represents the premise that human knowledge is rooted in social, cultural, and material contexts. Consistent with this theory, learners connect with other learners of various perspectives and backgrounds within a community of practice to develop their knowledge from collaborative interactions and diverse skills (The New London Group, 2000). These knowledge processes consist of both design and pedagogy. Earlier in this chapter, I discussed how Mike and Brian designed knowledge processes associated with various collaborative and interactive activities represented by modes of meaning within the multiliteracies multimodal framework. During Mike and Brian's meaning-making they also demonstrated how they adopted and shared their knowledge with peers from creatively designing and redesigning 'knowledge processes' (see Figure

6) including: experiencing, conceptualising, analysing, and applying. Table 6 represents sample data of the multiliteracies pedagogical acts or knowledge processes that Mike and Brian exhibited while engaging in video gameplay during the study.

Table 6

Sample Multiliteracies Pedagogy for Mike and Brian's Meaning-making.

Experiencing (Known/New)	Conceptualising (Define/Theory)	Analysing (Functional/Critical)	Applying (Appropriate/Creative)
Brian refers to playing with peers – humans as best training partners	Mike explains his favourite games are ones where he can explore psychological aspects of characters and other players	Mike indicates how video games help him to develop analysis, problem-solving, and decision-making	Mike shares his knowledge about differences he sees in play styles of Asian vs Canadian players
Mike's video game choices and surroundings helped him to build friendships	Mike and Brian mentor other players – often stopping video game tournaments to explain strategies	Mike indicates his favourite video games are ones that you have to be smart in—notice small details	Brian explores meta-game ideas in other mediums
Mike participates in online video game forums	Brian explores metagame ideas by playing games with in-depth storylines and understanding emotional depth of characters	Mike evaluates other players—their weaknesses and strengths, such as predicting, reading your opponent, and psychological aspects	Mike experiences emotion and attachment to a character – calls her mom
Mike connects with other players to discuss strategies	Brian attends weekly university tournaments playing with older players to gain knowledge processes	Brian explores gender in his gameplay – often playing female characters	Brian-Talking about games, sharing and telling others ideas
Mike refers to sometimes picking up bad gameplay habits from other players	Mike describes details of the Undertale storyline and decisions he made in strategies	Mike analyzes small details in games for predicting and decision-making	Brian expands on ideas of games writing and creating new works

4.9.2 Experiencing: In what ways do multiliteracies influence cultural knowledge?

One of the ways Brian made meanings during his video gaming experiences was by playing with human partners. Brian appeared to attach importance to having friends to play with because they talked and discussed ideas. Brian explained, "It varies from game to game ... but if I'm playing a game like Smash Brothers it's better to have, better to have a human, another human to practice against, where your peers are the best training partners." This comment suggests that Brian experienced the known (Cope & Kalantzis, 2009) by engaging in video gaming experiences with familiar friends and peers. At the same time, Brian experienced the new and unfamiliar texts while gaining new insights from learning other play styles and strategies collaboratively with peers. In this way, Brian preferred to play with human partners rather than against a computer, suggesting the ways he made meanings were grounded in his activities in real world patterns of experience (Cope & Kalantzis, 2009). Brian did not rely on self-taught initiatives to develop his cultural knowledge. Meaning-making for Brian involved socializing his experiences, suggesting he preferred to actively learn and gain knowledge from others (Gee, 2007; Vygotsky, 1978). Reflecting on his experiences, Brian privileged these opportunities to gain new understandings about video game strategies, problem-solving, and decision-making by exposing himself to other learners' perspectives, cultures, and ideas (Cope & Kalantzis, 2009). Brian's preference to play games, such as Super Smash Bros. Melee, also provided him with opportunities to share and train others. Playing this video game, Brian worked effectively as an interdependent team member in order to build his cultural knowledge.

Brian used the cultural term "positive fleeting moments" to refer to some new experiences. These moments were sufficiently relevant to his own lifeworld and everyday experience but assumed new meanings for him (Cope & Kalantzis, 2009). Brian explained, "like fleeting positive interactions with people ... everyone gets excited about it that second and then like the game continues." Brian referred to interactions with people as being positive and exciting during games. His knowledge process also involved experiencing the known and familiar. One of ways Brian demonstrated his meaning-making was through collaborative activities, sharing ideas, and mentoring peers. Brian

demonstrated oral literacy skills by his way of sharing those experiences. He explained, “I feel like there are so many experiences you can share with people, narrative or just, interpersonal things like that just ... moments that are just for everyone.” This comment suggests that Brian focuses on oral discourse. His actions are interesting because they differed from the assumptions put forth by Gurian and Stevens (2010a, 2010b), who found that boys tend to rely on the brain’s right hemisphere associated with spatial skills, as compared to the girls who put more emphasis on the left hemisphere used primarily for verbal skills. Brian’s comment also suggests that he constructed his cultural knowledge from video gaming experiences by reflecting both on his own values, beliefs and perspectives, and also that of others.

Mike’s video game choices helped him to build friendships. One of the ways that Mike experienced the known and familiar was by playing Super Smash Bros. Melee with his friends. Mike favoured the social aspects of this game that contributed to his friendships with other players who shared common interests. Mike explained, “I actually met a lot of friends through Melee. Ummm pretty much my best friends are all in the video game club.” Mike’s comment also demonstrated his awareness of how these video games socially situate gameplay, as they involve partners and teams. Furthermore, Mike associated meanings with familiar surroundings, such as an after-school video game club and a university, in a way that resembles Vygotsky’s (1978) explanation that “children acquire an independence with respect to their concrete surroundings” (p. 28). Mike appeared to choose familiar places to engage in video gaming practices, to connect his learning experiences and to build friendships.

Experiencing the known (what the learner already knows) and new (new knowledge that is learned from experiences) for Mike came from being an active member in his online community of practice. Mike exhibited experiences and learning from a broader interactive online framework consisting of mentors from his member community (Cope & Kalantzis, 2009; Steinkuehler, Squire & Barab, 2012). He developed discourses and meaning-making through this formal and informal online community of practice, and consulted with other players by reviewing the forum-based discussions. Mike’s engagement in collaborative peer-based forums allowed him opportunities to review, respond, and critically discuss theories and different strategies about gameplay. Part of

meaning-making for Mike involved playing games online, as well as face-to-face with friends and peers. In this way, he could combine his known and new experiences, thus gaining knowledge from multiple resources.

On one occasion while playing Super Smash Bros. Melee with his friends, Mike shared his pattern of after-school video game playing at home with his friends: "Umm. Yah I mean just like it's nice to be with your friends ... you get to talk to them, yah, yah like I, I invite my friends over like every week, just playing Melee ... we can practice, so I talk about different strategies and stuff." Mike's home video gaming experiences demonstrated his familiar knowledge of Super Smash Bros. Melee video games. Mike's at-home experiences of self-initiated play, combined with sharing his learning processes with friends represented a weaving of experiences from an individual and a group perspective (Cope & Kalantzis, 2009). It also demonstrated his high interest in playing the game and his level of dedication and preparation for upcoming tournaments.

Mike experienced the new and built his cultural knowledge by inviting his friends to his home and talking about different strategies with them. Mike's out-of-school video gaming practices with friends represented the way he exposed himself to new information and ideas by talking about video game strategies with friends. He explained to me that these discussions were meaningful to his video gaming practices as later he would often put these strategies into practice at the Super Smash Bros. Melee tournaments. Mike inviting friends over and talking to them about the strategies he learned was a way for him to develop bonds and strengthen his friendships with them. He confirmed this motivation when he qualified this comment with the following statement: "just talk about other stuff at the same time not video game related."

Mike focused his playing experience on character choices to provide him with new opportunities to study his opponent. He continually sought out occasions to learn and experience the new by relying on his own familiar set of skills. Mike's ability to benefit from studying his opponent demonstrated his literacy skills in active observation and critical reflection. Mike's critical reflection of other players allowed him to evaluate his own playing strategies and develop his own theories for conceptual changes. During these experiences, Mike observed opponents in order to evaluate their play strategy,

including their bad habits or decisions. Mike explained, “like Melee doubles ... um it’s a lot easier to have them next to you so if you notice something that the opponent team is like, maybe a bad habit ... you can share it with your partner.” Mike was extending his literacy skills and own understanding of reading and observing an opponent’s game strategies. In this way, he made a connection to his own prior knowledge and made decisions by predicting what the opponent would do next.

4.9.3 Conceptualising: Do, and how do, social dynamics contribute to boys’ multiliteracies skills and cultural experiences?

Mike explained that his favourite games are ones in which he can explore psychological aspects of characters and other players. Mike used video games to learn how to think ahead, conceptually defining his cultural terms and predicting and reading his opponents. As well, he often used different cultural experiences to improve these skills. These activities revealed that Mike was an active conceptualizer, drawing distinctions between the psychological aspects of characters and players. Mike’s interactions with partners became a significant domain for him as he used these experiences to improve his own knowledge in strategy and decision-making. He explained “like psychological aspects, there’s technical, you just have to have this prowess like ... reading your opponent ... Predict what they’re gonna do.” In his active theory making, Mike developed a mental model about reading his opponents, which he actively used to interpret the play strategies. Mike demonstrated a close reading and predicting of his opponents by the way he drew distinctions between his actual experiencing of the gameplay instances and his conceptual theory (Cope & Kalantzis, 2009). Mike’s conceptualising process involved first naming the cultural concept “psychological aspects” and then engaging in practices to theorize the concept. Mike showed interested in players’ behaviors and their motivations during gameplay sequences. In this way, he demonstrated his cognitive ability, as in Vygotsky’s (1978) blending of “practical and abstract intelligence” (p. 24). Mike was methodical in his process of evaluating players and predicting their moves by finding opportunities to observe them. For example, he would usually choose a human partner over a computer-controlled player. To build his knowledge and interpretative skills of what he observed, Mike also borrowed from paratextual resources by learning about technical mechanics of characters and how they operated within a game. Mike

indicated his awareness of some players who had bad habits when they engaged in video gaming. These habits, he explained, stemmed from playing a game sequence by trial and error rather than understanding the mechanics and options available for a character. Mike demonstrated his competencies, a cultural term he defined as “prowess like ... reading your opponent” by playing a video game while simultaneously making concerted efforts to analyze other partners.

Their willingness to mentor indicated that Mike and Brian considered themselves experts within their community of practice. In their knowledge making processes, they emphasized the importance of mentoring, sharing, and transferring new concepts that they learned with others. Mike and Brian would often disrupt tournament matches to give peers opportunities to learn new strategies. Their desire to facilitate and mentor others with their acquired knowledge demonstrated their active participation within their video gaming surroundings. As active members, they found opportunities to produce meanings and share with others. The following represented some of their commentary with peers during a tournament I observed:

Mike: No, he's always down if you doing an aerial next time he jumps it's.. Brian can we time out?

Mike: So whenever Brian comes down at you, down throw and sidekick, that's your ... See if you side viewed first then jumped.

Mike says to Brian: Can you pause a minute?

Mike: gently point upward and deete, deet, deet ... His uphill goes in front of him ... So they explain ... upsmash (Mike, Brian, personal communication, after-school video club case, November 2015)

This random commentary during a tournament demonstrated how Mike and Brian privileged mentoring their peers over the actual competition. Mike and Brian's active theory making demonstrated their willingness to collaborate and socially interact with others, contributing to the ways they actively learned and gained knowledge from each

other (Vygotsky, 1978). They also demonstrated literacy skills, associated with developing strategies and decision-making.

Brian explored metagame ideas (the degree to which a video game's characters and plot can evoke emotion from a player) by playing games with in-depth storylines and emotional depth of characters. Brian explained, "You get to like really live with the characters like Undertale would be like an adventure game – you experience things as things happen." Brian's preference for games primarily included interactive adventure games, where players could engage with the narrative game elements in order to redesign their own narrative performances or co-construct stories. Additionally, Brian preferred to engage with the immersive quality of games to provide him with emotionally compelling experiences. Brian explained, "Soo primarily I'll play very story driven Indie games or ummm, very ahhh very narrative focused or centred around parts of a game's sort of emotions that trivial games don't normally explore." Brian was an active theory maker, building his knowledge processes by interpreting and exploring these experiential types of adventure games. He did not clarify his comment about what games he considered as trivial; however, his comment suggests that he preferred games that employ abstract frameworks, such as emotional boundaries from which he can evolve his knowledge processes (Cope & Kalantzis, 2009).

Brian also attended weekly university tournaments playing with older players to gain knowledge processes. Brian referred several times to video gaming experiences when he attended weekly Super Smash Bros. Melee tournaments: "we go to weekly tournaments ... getting better next time, you know learning about the game and ahhh how we can do better and how we can finally learn about strategies about players we're having trouble beating." Brian's comments suggest that he was focused on learning strategies, perhaps reading opponents; however, he does not mention this aspect. Brian did refer to the weekly tournament experience as a way to exchange ideas with other members who assisted them in learning the game and strategies. His comments also suggest that he was an active contributor to a team and placed more importance on collaborating to learn rather than being a self-directed learner. His comments indicated how he was motivated to participate in the tournaments based on the common goals of learning and social interest shared with other players, even though they were older and in university, with

less emphasis on competition. He was an active conceptualiser through his participation and membership at these tournaments and also in the way that he engaged in collaborative discussions with other players, reflecting on what happened and negotiating future strategies.

Mike conveyed his conceptual decision-making processes when he shared his experiences about an experimental video game, *Undertale*, which he regularly played. Mike explained, “ahhh a very recent game ... not that difficult or anything but the game has a lot of decision-making.” Mike’s comment suggests that he would prefer games that present interactive opportunities or experiences requiring decision-making. He was also quick to point out that the game was not difficult. He often explained that choosing video games to be “smart in” was important to him. Mike’s clarification demonstrated that he was willing to give up difficulty or challenge in a game if he was able to have a cultural game playing experience involving decision-making: “Ummm ... Yeah so making decisions quickly and making good decisions. Because if you don’t make good decisions then something bad can happen.” This comment suggests Mike focused on developing his strategy in games in terms of decisiveness. Mike’s comment also suggests his impatience for an outcome because he focused his efforts on the quickness of the decision-making process. Mike’s reference to the importance of making good decisions to avoid bad things could suggest that he was risk averse in his behavior, being careful to choose decisions that supported only positive results in his cultural game playing experiences.

4.9.4 Analysing and applying: Do, and how do, video game usage contribute to boys’ cultural knowledge and use of literacy skills?

Mike’s preference was to play *Undertale* to develop analysis, problem-solving, and decision-making skills. Mike’s knowledge processes involved analysing logical connections, using all the video game options, to understand the cause and effect of decisions he made within gameplay sequences. Mike explained how the game was interactive, thus allowing a player to connect to characters and analyze potential decisions. His comment highlights his awareness of and focus on the end goal or outcome. He focused more on what would happen after he made decisions, than on the

game's storyline or the points involved. Mike's problem-solving skills were highlighted when he used the video game as an experiential learning space to utilize the complex tools offered in the game. He explained his idea when he played Undertale, "Uhh it teaches you how to analyze things." Mike explained that his game playing experiences allowed him opportunities to discover fine, small, insignificant details:

Yah the first time I played I kinda just played through the easy way, cause I didn't know all of these like secrets and stuff, the second time I played ... I started noticing different things ... then I purposely started making different decisions to get different outcomes. (Mike, personal communication, after-school video club case, November 2015)

For Mike, analysing, interpreting, and testing various semiotic elements in the game enabled him to gain knowledge about the best decisions. Mike experimented with different outcomes or found secrets in the game, demonstrating critical thinking and decision-making by comparing his known experiences to new concepts he learned. His comment also suggests that he relied on paratextual information and sources from in-game text-based online forums to provide him with guidance about secrets for the game.

Mike also demonstrated his analytical abilities by focusing his preferences on video games that you have to "be smart in." Mike recognized his own actions, thinking processes, and perspectives on game preferences and experimented with different mediums and games. Mike demonstrated his reasoning powers as a critical thinker by assessing and noticing small details and the number of different decisions that could result in different outcomes. He experimented with those decisions and determined the different outcomes. Mike's explanation also demonstrated that he took some risks by choosing these different decisions. Through his knowledge processes, he concentrated his efforts on small details and secrets within a game in order to learn the tools necessary to achieve his goals. Mike was more interested in developing an action plan that would result in the decisions necessary to achieve outcomes.

Mike evaluated other players to determine their weaknesses and strengths, such as predicting, reading your opponent, and other psychological aspects. He was a keen

learner who analyzed small details and secrets in games and often described his most favoured video game preferences as the “ones that you have to be smart in. Uhhh there’s just like psychological aspects there’s technical, you just have to have this prowess like ... reading your opponents ... predict what they’re gonna do.” Mike’s reason for playing these types of video games, such as Super Smash Bros. Melee, was to practice his observation skills of reading his opponent and anticipating their next moves. Mike was critically analysing by interrogating the motivations, meanings, and actions of other players. Mike often drew upon his cultural video game experience by identifying characters to help him advance his skills in reading an opponent. Characters that Mike and his opponent chose would be classified by their quantity of tools. The number of tools a character had was a significant part of Mike’s analysis. Mike explained his reasoning: “because they have less tools, it trains you to really be able to read your opponent, and there’s that term again, you can predict it even better and it’s just like you have to read them even better, so it’s like good training for it.” Mike understood that character mechanics allowed him to develop strategies to evaluate the defensive and offensive options available to him in order to compete with other players.

During my observations, Brian would interchange his gameplay characters in Super Smash Bros. Melee, often assuming the roles of female characters, suggesting he was not a stereotypical video game player by relying on negative identity constructions when playing video games. Brian explained, “Choosing characters ahhh has never been ummm ahhh a question of masculinity. You probably noticed in fact that two out of the three characters that I primarily play in Smash Brothers are female.” Brian’s exploration of gender demonstrated how he critically analysed and evaluated his own meanings, actions, and perspectives. Brian’s reverse gender role choices provides insight that some boys are not influenced by stereotypical, dominant definitions of masculinity in video games and that boys can express their masculinity in different ways (Mac an Ghail, 1994). Brian’s comment demonstrated his own interest behind his motivational choices, recognizing his character choices were opposite to his own gender in most cases.

To help better understand what Mike meant by predicting and problem-solving, he provided an example and explained what he did when he played the video game Legend of Zelda: “Thinking ahead too, maybe you do something now and get a certain number of

points that you think is really, really good, but if you choose a harder option, then like in the future there would be more reward.” Mike’s comment demonstrated his functional analysis of processes involving logical reasoning skills to understand the cause and effect of different options. Although Mike’s comment illustrated his focus on competition and reward, it also revealed that he was willing to forego immediate satisfaction of high game points by electing harder options within the game. Such reasoning reveals Mike’s desire to challenge himself, focusing on long-term end goals, and his ability to discern how his actions would help him achieve these goals.

Mike shared his knowledge about the differences he had observed in the play styles of Asian versus Canadian players. Mike applied his knowledge and understanding of real world situations by outlining his perceptions of different players from diverse backgrounds. When Mike engaged in online video gaming experiences, he encountered various players of different ethnic backgrounds and used these online gaming experiences to gain a perspective about different play styles. He explained,

And also there’s like more variety with like gameplay. It’s like different playing styles. Which is really interesting cause like Canadian players ummmm, back to Melee, they always have or usually they like stick to a certain style, like Canadian players tend to be more defensive and umm, Japanese players are really offensive that’s what they specialize in. (Mike, personal communication, after-school video club case, November 2015)

Mike’s explanation of various play styles associated with players in Canada and Japan demonstrated how he utilized his own knowledge and experience about video game play styles and applied it to players from diverse backgrounds. Mike identified cultural terms associated with each ethnic player. For example, he associated Canadian players with being defensive compared to Japanese players who were offensive. Mike’s online experiences helped to extend his knowledge by exposing him to different players’ ethnicity and play styles. It is possible, however, that the online identities of those players may not have been representative of their actual ethnicity.

Brian explored metagame ideas in other mediums. His video game preferences focused on experimental games, such as *Undertale*, and adventure games such as *Super Smash Bros. Melee*. Brian shared the reason for these specific video game choices: “So, I really, really enjoy games like that explore metagame ideas or like emotional ideas that you just can’t quite get at in other mediums. That interactivity is such a great, uhhh great thing for expressing ideas.” Brian’s comments, with specific reference to metagame ideas, suggest that he prefers games that have depth in characters and plot. Video games that explore metagame ideas help him to creatively apply meaningful connections and explore emotions. This is probably why Brian’s game playing preferences centred on adventure and experimental video games, which offer players different experiences than point-and-click video games. Brian’s preference for experimental games that explore emotion also suggests that these video games help Brian evaluate, assess, and express his ideas, thus building cultural knowledge. Brian associated many of his cultural game playing experiences with the emotional boundaries of a game. He expressed ideas and feelings and ways he thought about characters:

Soo primarily I’ll play very story driven Indie games or ummm very ahhh very narrative focused or or centered around parts of a game sort of emotions that trivial games don’t normally explore. Emotions, pushing the boundaries of games. As an interactive medium rather than just a playing out a scenario as a character that people know. (Brian, personal communication, after-school video club case, November 2015)

Brian’s comment suggests his preference for engaging in video gaming experiences that allow him to interact with the characters that offer flexibility—specifically two-dimensional character designs in a story, rather than a single dimension of a character that has no depth. Brian applied his creative skills by exploring characters and themes of storylines, thus making meanings and learning new concepts.

Brian also shared how video games pushed the boundaries: “Took this cliché from this other game, just turned it on its head, made it five times more interesting.” Brian reflected on different playing experiences in multiple dimension games and made sense of the multilayered, intertextual elements of the game.

Mike experienced emotion and attachment to a character that he called “mom”. When Mike played this experimental metagame, talking to characters through the on screen text dialogue, he developed an emotional attachment to some characters, and referred to one as mom. These emotions exhibited by Mike were some of the different cultural terms included in this domain. Mike viewed exploring emotion in a video game as a very different and active experience. He explained his reasoning,

They're called monsters but they're not like bad or anything, just like humans, but a different form. And there's a bunch of different ones, so like like a deer saves you, umm and just like cares for you and you start talking to it and it's just like it makes you feel really attached to the game ... and it's just like a really good experience, because you get really emotionally attached to this creature. You call her mom afterwards. (Mike, personal communication, after-school video club case, November 2015)

Mike's overall comments suggest a genuine compassion in his personality. His reflection that monsters in the game are not bad, that they are just a different human form, suggests he had empathy and accepted others. The way Mike made meanings from his video game playing experiences was by reflecting frequently on his attachment to the game. Mike applied his knowledge in appropriate ways by perceiving the video game character interaction as being an authentic experience for him, such as calling it mom. The game contains complex forms of interactive visuals that allow Mike to understand the multimodal meanings in a variety of scenarios within the game's context. He did not just experience emotions in terms of describing an event, but he explained his experience as an emotional attachment to a character, recognizing how it cared for him and how he responded by calling it mom afterwards. The way Mike explained his experiences playing this type of adventure game suggests he thinks reflectively in his responsiveness to the story and characters. His responses also demonstrate the depth of his sensitivity to others, such as calling a video game character mom.

Brian creatively applied his knowledge processes by talking about games, sharing, and telling others. He explained, “I tell my friends about the games I just played and how

great they are, tell them that they should play them ... so I could talk about it with them. I'm not a huge writer." Brian's comment places more emphasis on oral rather than written communication. He explained that his experience talking about games was more in terms of the overall game, without providing specific details. Brian at one point, made a comment about plot and characters: "I talk a lot to people about yahh I guess I talk about them," but again he did not provide specific details about particular video games or the significance of this experience. This comment does suggest he was focused on narrative literacy elements, such as plot and characters, as part of the skills he built for his cultural knowledge.

I observed Brian interacting with his peers, chatting, and laughing with them, but he did not provide many details about the games he played. Again, this seemed out of character from what I had observed, but he later shared some reasons for his lack of detail. Talking about mechanics, characters, and willingness to talk to whomever was willing to listen were cultural terms often referred to by Brian: "Umm, not everyone wants to talk about games in a way I really, kinda surface level, graphics, maybe mechanics. And ahhh things like that, characters, it's just yeah, I've I'm willing to talk to whomever is willing to listen." Brian's comment suggests that he recognized opportunities to effectively communicate and talk with others, but perhaps not everyone shared the same ideas with him. Brian's willingness to talk to whomever was willing to listen, suggests that he may have in-depth knowledge of video gaming experiences and design, and that he may believe others do not possess that level of knowledge: thus, they would need to listen, rather than collaborate with him. Brian also indicated that others talked about games at the surface level, graphics or mechanics, which differed from his interest in the games. Brian's comment which shared his perspective about games suggests that he saw himself as a cultural knowledge expert.

Brian also recognized that his choice of video games represented the fabric of society. He explained that these games "do a really good job of subtly hinting at ahhh at the out of game parts of peoples' lives." Brian interpreted the events he experienced in the video games as events that could represent what happens to real people. His interpretation also suggests his responsiveness and sensitivity or awareness of the needs of others. Brian further clarified his perspective about the video game, *Undertale*: "You get to like really

live with the characters ... you experience things as things happen.” These general perspectives about sharing moments suggests that Brian has preferred lines of communication. Brian explained that he had “never been one to write stories or stuff like that sometimes I’ll share them with someone who is capable about stories.” This illustrated Brian’s ability to reflect and his willingness to share his ideas with others, though he focused less on writing skills and more on oral communication. Brian demonstrated reflective thinking skills by clarifying his explanation: “So I find that really appealing and interesting to think about and talk about ... ahhh when I think through, through game plot, ideas, and stuff.” This comment suggests Brian focused his game preferences on ones that gave him an opportunity to think about a game plot with more complex details. Brian’s focus on oral communication skills was further clarified by his non-interest in writing:

I’m not a huge writer, but ummm I mean if it gets my point across then sure it’s fine. If I’m writing about a game it’s just in place of talking about a game with someone else it’s, it’s not writing, because I’d like to expand, on an idea about the game ... it’s just a means of conveying what I think of the game to other people. (Brian, personal communication, after-school video club case, November 2015)

Brian’s comments suggest that he used opportunities to talk to people to convey his ideas about games. He creatively applied his knowledge by adapting and evaluating new ideas or new ways to approach his video gaming experiences. This evaluation of new ideas fits with his preference for video games that push boundaries or exploring metagame ideas. Brian further explained his position:

Ummm things like that are interesting. I find something to learn about. Ummm so I generally I either play games that are focused like pretty much completely on narrative ahhh so like kinda like experimental games or like games that are exclusively about ahhh like skill. (Brian, personal communication, after-school video club case, November 2015)

Brian's comments suggest that he differentiated his playing experiences by separating his game choices between strategy multiplayer video games like Super Smash Bros. Melee and meta emotional experimental video games like Undertale. Brian's focus on experimental video games may also suggest that he makes his experiences meaningful by choosing to play games which concentrate on genres such as stories or emotions, or ones that provide a valuable skill, such as strategy: Otherwise, he shows little interest in wasting time on playing those types of video games.

This section has covered how Mike and Brian, at the after-school video game club explored their cultural video gaming experiences, focusing strongly on decision-making, exploring emotions, and sharing moments through collaboration. They demonstrated different cultural terms that were meaningful to them and also developed these experiences through their video game preferences.

Chapter 5

5 Chapter overview: Discussion and analysis

In this chapter, I examine and analyze the cultural meaning systems and patterns that emerged from the findings presented in Chapter 4 and relate these patterns to theoretical positions I put forth in earlier chapters. In addition, I further analyze these patterns based on the Learning by Design framework (Cope & Kalantzis, 2016). From that analysis, I present suggestions and implications for educators, by specifically drawing attention to video gaming and adolescent boys' literacy development by using the multiliteracies theory (Cope & Kalantzis, 2009; The New London Group, 1996, 2000). I also present implications of my study for research.

My choice to utilize an ethnographic multicase study strengthened the authenticity of the contextual cultural experience for my study participants, four adolescent aged boys—Albert, Jeffrey, Mike and Brian—who regularly played video games in different settings. Placing these four boys methodologically and strategically at the forefront, provided me with an advantage to capture some of their real-life activities and unique experiences within two particular settings. Thick descriptions (Wolcott, 1987) of the boys' experiences and behaviors also enabled me to forge a pathway to the ways they constructed cultural knowledge systems.

To organize the data in Chapter 4, I utilized an ethnographic approach combining domain taxonomy (Spradley, 1979), called cultural meaning systems (D'Andrade, 1981), then I analyzed the findings based on multiliteracies multimodal framework and pedagogy (Cope & Kalantzis, 2009; The New London Group, 1996). This combined approach allowed me to deconstruct the collective cultural knowledge (see definition of terms in section 1.7) of the four boys. By way of deconstructing the collective behavior of the four boys in particular surroundings (Wolcott, 1987), I began to classify and interpret their actions, words, and stories into categories or domains to understand how the boys attributed meanings to their cultural experiences. In this chapter, the final step is componential analysis (Spradley & McCurdy, 1972). This step involves contrasting cultural terms included in the domains, and more importantly, the attachment of meanings or how different associations were reflected in the multiliteracies framework.

What I have teased out in my study is how the boys made sense of their experiences, made meanings and engaged in knowledge processes independently, and with each other. Recall from Chapter 3, those meanings can be denotative, involving referral to a thing, mostly by physical attributes, but a meaning can also be connotative, connecting an abstract significance or meaning based on experiences or cultural knowledge (Spradley & McCurdy, 1972). For some of the boys' experiences, these meanings were similar, whereas in other situations they varied. This contrast contributed to the analytical patterns, and from this analysis, I was able to derive cultural themes that exist within this cultural knowledge. Cultural themes represent how relationships exist among the cultural domains (see Table 2) and more importantly, the distinguishing factors among those domains (Spradley, 1979). I analyzed and examined the dimensions of contrast that emerged to form cultural knowledge, based on the boys' actions, and meaning-making. The purpose of componential analysis is to identify the parameters or boundaries of definition for cultural knowledge and meaning systems. I also analyzed these cultural meanings to determine how these meanings might align with the Learning by Design framework (Cope & Kalantzis, 2016).

I want to return briefly to the question, which formed the basis of my study:

In what ways do multiliteracies (The New London Group, 2000) as practiced by boys through computerized video game technologies and associated networks influence their cultural knowledge?

A subset of this overarching question considers,

- a. What types of video games do boys prefer to use outside of school?
- b. Do, and how do video game usage and surrounding networks act as contributing factors to boys' cultural knowledge and use of literacy skills?
- c. Do, and how do social dynamics contribute to boys' multiliteracies skills and cultural experiences?

I formulated these questions based on my need to better understand and make sense of how the four boys made connections and meanings about their video gaming experiences as a way to cultivate cultural knowledge. I wanted to make sense of their particular contexts, social dynamics, the ways that they collaborated and interacted with each other, and how they used surrounding networks. I also wanted to understand in what ways they relied upon cognitive abilities (spatial, verbal, and written) through their choices of video game, social dynamics, or video gaming experiences in general. At the same time, I needed to explore, using ethnographic methods, alternative suggestions made by OME (2013), to address the root problem with boys' learning outcomes. I acknowledge some concerns do exist regarding the media-driven negative discourse about boys' video gaming practices. Although I did not conduct clinical tests for cognition during this study to relate back to literacy scores, I did thoroughly examine these boys' social interactions, behaviors, and cultural meaning systems. The taxonomic analysis of these domains is included in Table 2 along with a sample listing of cultural terms, which represent the majority of cultural terms used by the boys.

5.1 Taxonomic analysis of domains

The purpose of the ethnographic taxonomic domain analysis was to organize the cultural terms and identify cultural domains or themes. These domains represent associations made by the boys and lay the initial groundwork for several cultural terms that emerge from my study. The analysis of the domains is related to the cultural meanings made by the boys. This analysis provides me with an underlying ethnographic framework to understand how the boys made meanings based on what they experienced and how they shared moments and collaborated with each other. My overarching research question "In what ways do multiliteracies (Cope & Kalantzis, 2009; The New London Group, 1996) as practiced by boys through computerized video game technologies and associated networks influence their cultural knowledge?" is addressed by the cultural domain taxonomy (see Table 2). The data emerged from observations, field notes, discussions with the boys, and semi-structured interviews. Each of the boys spoke of the ways they made sense of the video games they engaged with, how they learned independently or how they collaborated with others. Throughout the taxonomic analysis of domains in this

section, I will also refer to the video game preferences (Figure 2) and the sample cultural terms (Table 2).

The decision-making domain relates to the boys' references to and demonstrated reactions and meanings about making decisions. In their knowledge processes (Cope & Kalantzis, 2009), the boys preferred using certain types of games that would develop their ability for decision-making. For example, Mike and Brian often referred to playing multiplayer competitive games, such as Super Smash Bros. Melee and experimental games such as Undertale, whereas Jeffrey and Albert referred to narrative-based video games called Never Alone (Kisima Innitchuna) and Valiant Hearts: The Great War and puzzle platformer video games called Portal 2 and Minecraft.

The boys often referred to the domain of problem-solving skills when they made choices about video games designed for problem-solving strategies. Certain video games, referred to more often, represented their knowledge processes in how they constructed meanings to relate to problem-solving. For instance, Mike referred to using Nintendo's puzzle platform video game called Legend of Zelda, whereas Albert would alternate between using Minecraft for building his skills and playing the video game Portal 2. Albert referred to puzzle platformer or puzzle games several times and therefore these are grouped together. Albert used these types of games for problem-solving and tended to alternate the types of games he played, rather than specifically use one game on a regular basis. Albert's alternating of the games he plays reveals that he may associate certain games with certain learning outcomes. This type of sequence in his actions became a point of interest for me to determine why he chose to do this. What I found was that in certain circumstances, for example, when he was trying to build his strategy to play multiplayer competitive video games such as Team fortress, he would play a puzzle video game called Minecraft.

The strategy domain includes cultural terms that the boys identified when they explained how they constructed meanings about learning strategic skills. They referred to two specific video games for this domain. For instance, Albert chose a multiplayer competitive video game called Team Fortress, while Mike and Brian specifically referred to Super Smash Bros. Melee to gain cultural knowledge for strategy.

The training partners' domain includes cultural terms that the boys referred to for their general overall video gaming experiences. Their experiences were specific to playing video games while using surrounding online networks as part of their informal and formal guided practice (Cope & Kalantzis, 2009) with random online players. For other experiences, they referred to playing with friends in person. The boys made two specific references - Mike and Brian referred to Super Smash Bros. Melee to help them to gain cultural knowledge about training, and Jeffrey referred to Valiant Hearts: The Great War for learning about history.

Some of the boys referred several times to the exploring emotions domain. For instance, Mike and Brian demonstrated cultural weaving and social cognitive functions, such as emotions, in their knowledge processes (Cope & Kalantzis, 2009). Mike and Brian attributed cultural meanings related to exploring emotions and meta ideas when they played experimental video games such as Nintendo's Undertale, whereas Jeffrey referred to experiencing emotion from being immersed in the context of certain narrative story-driven video games, such as The Last of Us or Valiant Hearts: The Great War.

The boys referred to the learning – sharing moments domain, based on their reactions and responses to their video gaming experiences in general throughout their knowledge processes. They referred to cultural terms that provided them with a reason for constructing their cultural knowledge, and to ways of learning about stories, literacy, thinking, discussing, collaborating, and sharing ideas and moments (Cope & Kalantzis, 2009).

For the domain of nonviolence and gender choices, the boys included cultural terms associated with meanings about gender and types of violent and non-violent content within video games. For example, Jeffrey made several associated meanings about certain characters placed in video games that were specific to non-violence, such as the Vortigant in the narrative-story driven game Half-Life 2. Mike referred to his phobia of blood and choose video games that were specifically categorized as non-violent children's' games such as Super Smash Bros. Melee. Mike commented: "I'm actually proud that I don't like that stuff." He provided further context about this by expressing how peers might interpret his choice to play non-violent video games, but this did not

discourage him from being open about his video game choices. Albert explained that he would experiment with alternate gender choices when playing video games, whereas Brian demonstrated some unconventional attitudes to gender stereotyping by expressing how he did not make any concerted efforts to be more masculine when he chose video game characters. In his meaning-making process, Brian evaluates his own perspective and value system. He provided context about his own family upbringing as a very caring, loving, and accepting environment.

The domain of cultural insights and environment include cultural terms, referred to by the boys, is related to building meanings from social dynamics. They demonstrated knowledge processes by collaborating in their environments, thereby interpreting the social context of cultural insights (Cope & Kalantzis, 2009). Jeffrey referred specifically to the video game *Never Alone* (Kisima Innitchuna), which was meaningful for him as it related to Alaskan heritage. Albert expressed certain cultural terms that were meaningful to him, referring to his experiences with social peers and social dynamics at school. Albert understood the school micro-culture of peer relations and explained to me that he had friends but would remain quiet and independent in order not to be influenced by social pressures. Mike and Brian expressed cultural terms that shaped their meanings of friendships from their video gaming experiences playing *Super Smash Bros. Melee*. Mike and Brian demonstrated social dynamics by their interactions with others mentoring and guiding them in game play techniques.

5.1.1 Video game preferences.

In this section, my sub-research question, “What types of video games do boys prefer to use outside of school?”, is addressed by the categorization of video games (Figure 2), and the boys’ preference of certain games over others in order to make meanings and build cultural knowledge.

One of the underlying distinguishing factors, which seemed to draw the boys together in their cultural experiences, was the types of video games they selected to achieve certain goals in their co-construction of knowledge. Various discussions with the boys aided in the classification of the video games into different multiliteracies functions or elements ranging from the decision-making domain, problem-solving domain, exploring or

experiencing emotion domain, and the strategy domain. The boys identified certain games for each of the aforementioned functions. For example, some of the ways that the boys chose to express or differentiate their cultural knowledge and meanings was through solving problems. What makes this cultural theme significant is how each boy distinguished his way of problem-solving by characterizing his experiences differently. Albert associated certain puzzle platformers video games, such as Minecraft and Portal 2, with problem-solving. Albert's preference for these types of puzzle platform games connects to Steinkuehler's (2014) study about 'Minecraft' which motivated students to learn literacy through their own discovery of the game's elements—spatial reasoning, math, and logic. Albert focused on independent learning skills, such as trial and error, for problem-solving and learning to achieve better outcomes in a game. Albert did not appear to associate using these strategy games to collaborate with others or learn from others, as was the case with Mike and Brian. Albert was persistent in his learning actions, with his intent focused on problem-solving and guiding team members. In this sense, video game preferences for Albert appeared to confirm the claims made by Sanford and Madill (2006) about motivations for playing video games. They reasoned that players focus on the action and decision-making elements to win or gain points, which mitigate any reflective literacy values.

In addition, the boys gained cultural meanings by choosing other video games for entirely different purposes. For instance, Albert chose multiplayer competitive type video games, such as Team Fortress, whereas Jeffrey preferred story-driven games such as Valiant Hearts: The Great War to support his interest in history and narratives. Mike and Brian played Super Smash Bros. Melee for teamwork for helping to develop strategies and predicting the skills and understanding behaviors of other players within a multiplayer network game. Using these games allowed them to play as interdependent team members rather than be self-reliant independent players. Their video game choices and actions position the boys as collaborative contributors to their own learning experiences (Vygotsky, 1978). In this sense, the video game preferences for Jeffrey, Mike, and Brian challenge the claims made by Sanford and Madill (2006), because they focused on reflective elements beyond competition such as learning history and mentoring peers during their gameplay.

Video game preferences specific to Mike and Brian were Super Smash Bros. Melee, and Undertale. Using Undertale, they both recounted the emotional attachment they experienced with characters and how this interactivity allowed them to explore sensitivity and empathy for others. Jeffrey focused on emotional interactive video games, such as Never Alone (Kisima Innitchuna), where he experienced Alaskan heritage, as expressed by Elders through interactive videos embedded within the video game. He also found that cultural meaning existed for him in an adventure video game called Valiant Hearts: The Great War. In playing this game, Jeffrey was able to engage with the characters (Van Sledright, 2002) and a non-linear storyline to understand history and experience emotional reflectivity (Alexander, 2009). Jeffrey's experience relates to Julio, a participant in Steinkuehler's (2010) longitudinal study, who played narrative driven games, shared these practices with peers, and enjoyed out of school practices. Albert too focused on narrative driven interactive adventure video games, such as Half-life 2, which depended on players to interact with characters to make decisions in the games while assuming the role of the character (Jenkins, 2006). The boys gained meanings through the social nature (Gee, 2003, 2007) of their video games.

5.1.2 Cognitive meaning-making: Decision-making, problem-solving, and learning strategy

Albert demonstrated experiencing the known through his familiar and routine play sequences. As a self-initiated learner, he would play puzzle platformer video games and then transition to choosing detailed strategy multiplayer competitive games, interacting with online players to experience the new and develop his problem-solving, strategy, and decision-making skills. Albert broadened his learning processes by building mental model skills—drawing distinctions between the familiar and different strategies needed for other games he played (Cope & Kalantzis, 2009). Thus, Albert focused on different ways of thinking about literacy, such as spatial skills, based on “divided visual attention” (Gros, 2007), by developing strategies about decision-making and problem-solving. Albert's actions parallel suggestions made by some scholars that meaningful learning, including critical thinking, problem-solving and decision-making, can occur during gameplay sequences (Hommel, 2010). He relied on certain gameplay sequences and game type preferences to develop his problem-solving, strategy, and decision-making

skills, perhaps through trial and error, in an experiential learning space (Squire, 2013). For example, on one occasion I found Albert playing his usual start up video game, Portal 2. While he was playing this game, he was eager to confide that he had trouble problem-solving, but that he had figured out the puzzle by continually playing this video game. His learning processes reflect Cope and Kalantzis' (2009) theory that meaning makers are agents by the ways they transform their meaning in dynamic ways—by patterning familiar and recognizable ways, reworking and remaking signs of meaning. Albert provided an example of this theory by indicating, “That’s how you do it. I was having trouble figuring that out on my own even over that last few days. I’ve been doing this wrong. I figured that on my own.” So rather than ask for help from other players at the community centre or consult online help boards to draw on the available community of practice, Albert alternated between the conceptual methods of problem-solving and experiential methods of trial and error (Cope & Kalantzis, 2009). Albert organized and managed his self-directed decision-making on which video game to play for certain purposes. By making use of experiential learning spaces present in video games, Albert could attempt several different methods and make meanings until he was satisfied with his learning goals (Apperley & Beavis, 2011; Gee, 2003; Squire, 2013). He would carefully analyze every step he took in the video game to solve a problem or redesign a new strategy. Albert played puzzle platformer games by applying and weaving different knowledge processes, and from experiencing these gameplay sequences, he developed skills to be self-reliant in problem-solving (Cope & Kalantzis, 2009). In this sense, Albert’s activities appeared to be focused on improving in the game, the strategy, and not necessarily making a connection to learning. In a way, his video gaming practices confirm Sanford and Madill’s (2006) view that boys play video games to “resist traditional school literacies” (p. 299).

Some ways that Albert demonstrated a secondary learning domain was the way he played video games independently. Albert gained insight from the available design of written language in the form of online screen text directions or commentary from online players (Cope & Kalantzis, 2009). These actions remind us of the shift in traditional literacy practices, such as linear reading on the page and can resemble forms of operational literacy.

What appeared to matter to Albert was his reliance on certain functions of games to achieve his learning strategies. In this sense, his actions confirm findings from a recent study about adolescent video gaming practices, conducted by Sanford and Madill (2007), who found many examples of what they called operational literacy. They found that the adolescents were able to read both visual and print instructions and use and adapt semiotic systems to meet their needs. Moreover, Cope and Kalantzis (2009) suggested that multimodality requires meaning-makers to develop different levels of imagination and transformational effort to redesign meanings and because of this “meaning construction has shifted in favour of the viewer” (p. 15). Albert would pause, read commentary from other online players, read directional information on screen frames, read maps, and then respond with a strategy, which he explained, “would help the team in some different ways.” Building on this directional guidance, Albert constructed these multiple meanings by borrowing from visual representations (Cope & Kalantzis, 2009), building items, or reviewing different images of character elements before choosing different characters, like a medic or engineer, and responding with his strategy. Albert’s active engagement of alternative out-of-school texts (Sanford & Madill, 2007) is representative of his ability to effectively manage these complex elements embedded within the games. These types of video games represent alternative texts that offer learners opportunities to practice some literacy skills by engaging in reading images and other semiotic sign systems, often characteristic of non-linear, multi-layered, intertextual texts (Alexander, 2009; Jenkins, 2006; Sanford & Madill, 2007; VanSledright, 2002). Albert demonstrated meaning-making at a metacognitive level from the way he interpreted paratexts during his video gaming practices. For example, while playing a multiplayer competitive game with a peer, Albert remarked that there were many references in the storyline to Marvel comics. This comment contributed to the way he was exploring paratexts to understand the interplay of the plot. By making connections and relationships with external resources, he was able to frame his understanding (Apperley & Beavis, 2011; Gros, 2007; Gumulak & Webber, 2011; Jenkins, 2006; Sanford & Madill, 2007; Van Sledright, 2002).

Throughout the study, Jeffrey also relied on paratexts for details in games. He would explain the background story, context, and history to situate his learning processes, and

critically understand the narrative content (Apperley & Beavis, 2011; Jenkins, 2006). Jeffrey demonstrated his cultural knowledge by relying on paratextual information, drawing upon “pre-existing knowledge and beliefs” (Squire, 2013, p. 115), and by reviewing game developer research to determine the authenticity of the Alaskan culture embedded in the video game *Never Alone (Kisima Innitchuna)* (Apperley & Beavis, 2011; Gros, 2007; Gumulak & Webber, 2011; Sanford & Madill, 2007). In a sense, this association with the Alaskan culture within the video game parallels findings from Jenkins (2002) who argued that games designed with embedded literary genres can induce players to make pre-existing narrative associations from games enacting certain narrative events. In his design process, Jeffrey made use of the dynamic interplay of visual and audio representations (Cope & Kalantzis, 2009) by actively engaging with the video game embedded authentic video elements. He explained,

Parts of the game *Never Alone* ... Cultural insights ... these little videos you would watch ... Elders come up to a camera. They would be interviewed by the developers ... They would talk about like their stories ... They would talk about the wisdom, the Elders.

Jeffrey made meanings by shifting between available modes in the video game, such as listening and watching the Elder videos between the gameplay sequences, representing a good example of synaesthesia. This term is key to modes of representations. Even if meaning-making is focused on one mode, it is still intrinsically multimodal with sound, images, and text side by side (Cope & Kalantzis, 2009). Jeffrey’s interaction with these elements represents how “conscious mode switching makes for more powerful learning” (Cope & Kalantzis, 2009, p 14.). Jeffrey’s experiences playing these types of narrative-based games also suggests that he is a reflective thinker, weaving and developing his cultural knowledge along with understanding other diverse cultural identities (Ajayi, 2011; Apperley & Beavis, 2013; Beavis, 2012; Cope & Kalantzis, 2009; Newkirk, 2002). Jeffrey’s reflectivity is an example of Squire’s (2013) argument that video game design “allows learners to share stories, theories, and experiences with their products, further tying the learning experience to their work outside the learning context” (p. 115). By Jeffrey drawing inferences about the assumptions built around these characters, he demonstrated his understanding of the functional relation between the cause and effect of

characters within a plot sequence (Cope & Kalantzis, 2009; Pillay, 2002). He also demonstrated his literacy skills by making meanings about the contextual significance of the storyline, which Duncum (2004) and Jenkins (2002) argued is a process by which learners decode and interact with the text and then link background experiences to new experiences to gain knowledge. Jeffrey demonstrated his cognitive awareness of the interplay of events and characters in the way he interrogated the author or developer's perspective. This is a good example of Beavis' (2012) and Jenkins' (2006) explanation of how meaning makers must have a familiarity with the back-story of a video game to contribute to their knowledge processes. Jeffrey also demonstrated his literacy skills of making inferences and drawing conclusions about characters and his keenness to follow the storyline (Cope & Kalantzis, 2009; Pillay, 2002).

The pattern among the boys, Albert, Mike, and Brian, revealed a strong interest in increasing aptitudes in decision-making, problem-solving, and strategy. These themes relate to how children focus their capabilities by hypothetical reasoning, and concerning themselves with the aim of improving capabilities with new experiences in solving problems (Piaget, 1972). Albert specifically chose puzzle platformer video games, such as *Minecraft*, and *Portal 2*, by associating these game-playing experiences with meaningful learning of new ways of problem-solving and strategy. He would sometimes use *Minecraft* before he played a multiplayer competitive video game called *Team Fortress*, where other players would rely on his skills of building or helping the team. Although Albert focused less on the setting or narrative plot events, being able to navigate multiple events, locations, and semiotics in a game enhanced his literacy skills to comprehend plot and characters (Gros, 2007). Albert consistently demonstrated the ways he organized his self-directed activities with persistence until he achieved his goal of learning a task (Aarsand, 2010).

Likewise, Mike, and Brian focused their efforts and interest on *Super Smash Bros. Melee*, which allowed them to build on their quick decision-making and strategic skills. For Mike, and Brian, cultural knowledge emerged from how they made sense of playing those specific video games. For example, Mike's cultural experiences connected to the ways he would improve his strategy and decision-making skills. Mike's clarification demonstrated his willingness to give up difficulty or challenge in a game if he could have

a cultural game playing experience involving decision-making. His reasoning relates to assumptions made by Sanford and Madill (2006) that players will sometimes favour quick-paced decision-making games and forego playing games with rich embedded literacy content. For example, Mike explained how he developed his own learning strategies for better decision-making during Super Smash Bros. Melee tournaments: "But at the beginning like once you just like ahhh get assigned to your partners and you have like thirty seconds to quickly make a plan, we've kinda developed our own language." Mike's comment demonstrated the ways he used his video gaming experiences to learn actively and gain knowledge from peers by developing language codes and speech. Mike's language development is an example of Vygotsky's (1978) reasoning that children use signs and words as the most important means of their social contact to communicate with others. This also suggests Mike's flexibility and adaptability. In addition he is highly responsive to video gaming tournaments, especially those involving high pressure, having only seconds to develop a plan and language in which to communicate. Mike's comments also illustrate the fact that his cultural gaming experiences involve resourcefulness, quick decision-making, and effective communication skills, utilizing his language development. This type of communication relates to Gee's (2009) argument that video games recruit a "specialized language" to promote learning "in and out of school" (p. 54). Mike's comment is a good example of his collaborative activities, often providing him opportunities to be creative and innovative with partners and reminding us of how children use surroundings to exchange information with others (Piaget, 1972). The university space for tournaments appeared to be an inviting social environment where Mike actively contributed as a member, which in turn provided him with positive reinforcement for developing his cultural knowledge (Gee, 2007; Lankshear, 1997; Steinkuehler, Squire & Barab, 2012). At the same time, Mike made meanings by reinforcing his own perspective and ideas (Cope & Kalantzis, 2009). His vocal actions related to sharing gameplay strategies and guiding peers, suggested ways in which he publicized his beliefs and values in a social setting. Thus, by providing feedback and suggestions about gameplay strategies Mike was allowing his cognition to be heard by others, creating a way for new concepts and new meanings to be developed (Cope & Kalantzis, 2009; Squire, 2013). Mike subvocalized and exhibited

verbal activities to engage and interact with others in a way that allowed him a pathway to share his cultural knowledge.

Mike and Brian demonstrated experiencing the new by directly seeking collaborative opportunities in team related video games, such as Super Smash Bros. Melee. For Mike and Brian, experiences of collaborating with others became meaningful to them. They viewed human partners as the best training partners, demonstrating their awareness that experiencing the new involves exposing themselves to other learners' knowledge processes (Cope & Kalantzis, 2016). Their learning processes resembled Vygotsky's (1978) zone of proximal development, where social activity enhances learning. For instance, Mike privileged the social aspects of gaming by engaging with friends who had common affiliations with learning strategies, decision-making, and problem-solving with Super Smash Bros. Melee. His meaning-making helped him to develop out-of-school literacy practices, such as listening, responding, and reflecting about meanings with friends (Alexander, 2009; Beach et al., 2006; Beavis, 2012; Gee, 2003, 2007; Steinkuehler, Squire, & Barab, 2012).

The boys focused highly on improving their skills, and although Jeffrey did not focus on these abilities specifically for himself, he did recount cultural experiences of reasoning skills specific to analyzing why historical events occurred in video game plots. Jeffrey developed his cultural knowledge by choosing non-linear narrative driven story games such as Valiant Hearts: The Great War or Never Alone (Kisima Innitchuna), in which he associated learning literacy with learning the story. Jeffrey developed cultural meanings from playing video games that he could change plot sequences or which had a non-linear storyline (Jenkins, 2006; Squire, 2013). His video gaming experiences were more meaningful to him than reading a linear story in a book or playing a puzzle platformer game, which lacked a storyline. Jeffrey showed a strong preference for playing the game Never Alone (Kisima Innitchuna). Jeffrey made meanings by discussing ideas about video games, including many small details. He appeared to focus on his oral skills as a storyteller (Steinkuehler, 2007). In playing this game, he experienced the known from viewing embedded authentic videos created by Alaskan Elders providing their wisdom through storytelling in real world situations (Cope & Kalantzis, 2009). Jeffrey experienced the new through his awareness of the Alaskan culture, and he demonstrated

this awareness by suggesting the need to preserve it and observing the lack of cultural and diversity competencies in schools (Ajayi, 2011).

Mike gained much of his formal and informal instruction from actively participating in online and face-to-face communities of practice. These online spaces are indicative of what Squire (2013) termed 'experiential learning spaces', where learners engage in rich collaborative interactions organized around a primary affiliation to their common goals (Gee, 2007). Mike demonstrated experiencing the known by contributing his values and ideas about strategies or video games to the online community of practice. Mike is a good example of Jansz' (2005) claim that players' social interest will influence them to "exchange information about (new) video games and gaming practices." By interacting with other online players and with peers at face-to-face university video game tournaments, he experienced his learning processes through his awareness of peers' knowledge and through building friendships. He exchanged ideas and posed questions about various strategies with others to develop his knowledge processes. In drawing from this diverse resource base of experts and novices, both online and face-to-face, Mike was experiencing the new by actively participating as a member within his community of practice (Cope & Kalantzis, 2009; Steinkuehler, Squire & Barab, 2012). Part of Mike's active engagement in the community of practice involved literacy practices referred to as metagaming (Steinkuehler, 2007) which involved his participation in peer-based discussion forums and chatrooms. This type of collaborative mentoring, Mike explained, manifested itself in the form of "reading your opponents ... Predict what they're gonna do." More importantly, Mike explained that he used chatboards, which also support and confirm alternative forms of literacy (Lankshear, 1997). His reliance on smashboards, which is similar to a message chatroom, represented for him a form of collaboration and communication in literacy. This alternative form of communication parallels Lankshear's (1997) argument that "new forms of discourse is [are] especially evident in such forums as electronic journals, email, news groups, and a diverse array of MOOs, webpages, message boards and the like" (p. 153). For Brian, he preferred to collaborate and share ideas with peers, extending and communicating ideas such as plots, storylines, and strategies. This cooperative style of learning supports Vygotsky's (1978) theory of socialized learning; to learn by others or with others. Brian's learning development is

highly reliant on collaboration and mentoring, which also echoes Lankshear's (1997) claim that the "hidden curriculum of gaming is an initiative into modes of practice that are characterized much more by learning, and self-collaborative direction and discovery than about whole sale exposure to teaching and instruction" (p. 151). Gee (2007), Vygotsky (1978), and Steinkuehler, Squire and Barab (2012) reiterated the importance of collaboration and mentoring, through the "depth of collaborative inquiry, complexity of gameplay, opportunities for consequentiality, rich perception – action cycles, exploration of situated identities and the complex forms of learning and participation that can occur during gameplay" (Steinkuehler, Squire & Barab, 2012, p. 271). He experienced the new by building his awareness of the differences among other players' theories and different strategies about gameplay (Kafai, Burke, & Steinkuehler, 2016). Mike maintained his online role consistently by demonstrating his commitment to his beliefs, reflections and play style, making his "cognition visible to participants" (Squire, 2013, p. 115), both with random players and with friends in the online community of practice.

5.1.3 Informal techniques of social dynamics—conceptualising.

One of the distinguishing factors common among the boys was the ways in which they demonstrated active concept and theory making (Cope & Kalantzis, 2009) by adopting and sharing knowledge processes through social interactions during their cultural experiences. These collaborative actions, words, and reactions among each other in their settings were classified in the training partners' domain. One of my sub research questions (Do, and how do social dynamics contribute to boys' multiliteracies skills and cultural experiences?) is addressed in this section.

Co-operating with friends and sharing ideas or gaming practices was important to Jeffrey, Mike, and Brian. Albert also interacted with online players but in a somewhat different way. His preference was to learn independently, then share his ideas through game walkthroughs. Different forms of communication also occurred during the boys' cultural experiences, which became meaningful for them. During my fieldwork, the boys shared ideas, interacted with each other and often recounted cultural experiences involving some form of social dynamics. In this way, they drew distinctions between their own gaming experience and their peers, given they played together and would exchange ideas and be

exposed to others' views (Steinkuehler, Squire, & Barab, 2012). What became significant in these gaming activities was how they attributed meanings to these experiences. Some of these social interactions involved playing together (Mike and Brian), sharing directions (Albert and Jeffrey), having discussions (Mike and Brian), and telling stories and asking probing questions with friends (Jeffrey).

Mike and Brian would often seek gaming activities with peers, whereas Jeffrey and Albert appeared to be more independent in their knowledge processes. Most times, Albert engaged in self-initiated learning from puzzle platformer video games, but this was in preparation for his video gaming practices with multiple online players, whereby he acted as an interdependent team member. Albert's ability to play independently and as a team member reflects his flexibility and adaptability in his playing experiences. Jeffrey at one point played one of these multiplayer competitive video games, and during much of this gameplay sequence he would give directions to Albert, and then they would alternate these roles, warning each other of pending threats and best strategies (Alexander, 2009). Their communication represented strategic planning, interdependence on each other, and collaborating, but not specifically producing or extending new knowledge. When they collaborated using this form of oral and visual support, they demonstrated their gameplay activity with socialized speech patterns in the form of oral discussions (Vygotsky, 1978). Steinkuehler, Squire, and Barab (2012) have long argued that when players play together they often exchanged ideas and are exposed to one another's thinking. Albert and Jeffrey shared and exchanged ideas about different strategies they used during the video game sequences, and also shared paratexts, such as developer information and references to comic book characters, referred to as "spontaneous knowledge" (Cope & Kalantzis, 2009) between learners who are active theory makers.

Mike and Brian often demonstrated active theory making (Cope & Kalantzis, 2009). They conceptualised their thinking processes for solving problems and developed strategies as a means to co-produce knowledge through exchanging ideas with other members of a team or partners in a tournament. Their actions mirrored Gee's (2007) description of players engaging in gameplay on equal playing fields through knowledge sharing and collaborating. What differentiated Mike's approach to solving problems was an emphasis on quick, correct decisions. Mike, and indeed Brian, did not work

independently through trial and error, as was the case with Albert, but collaborated with others, at least when they played the multiplayer competitive strategy game called Super Smash Bros. Melee. They played with partners in order to read their opponents psychologically and gain an understanding of how to “beat them.” Their learning processes resembled Vygotsky’s (1978) zone of proximal development in the way they observed and collaborated with more capable peers. They developed learning strategies such as problem-solving for quick decision-making and reading their opponents.

The cultural theme of social dynamics was also manifested through the collaborative interactions demonstrated by Albert. His flexibility and willingness to work with random online players to demonstrate gameplay walkthroughs using YouTube, directly relates to using a favourable environment in which to carry out an operation or exchange of information with others (Piaget, 1972). Albert’s willingness to exchange this information initially manifested itself through his own initial trial and error processes or period of adjustment prior to the formal exchange occurring (Cope & Kalantzis, 2009). In this sense, Albert differed from Jeffrey, Mike, and Brian, because he relied less on social interaction or mutual support to construct his cultural knowledge (Piaget, 1972).

Albert and Mike chose the puzzle platformer video games to learn independently to improve their gaming practices. They were not competing against others to achieve higher points, but rather they were developing their own skills to share what they had learned with others. They demonstrated these skills and extended learning by showing others. For example, both Albert and Mike provided instruction to random online game players, friends, and peers through walkthroughs and gameplays. Albert would use YouTube to facilitate some of these demonstrations (Vygotsky, 1978), whereas Mike would solve problems using Legend of Zelda and share those strategies with others. What distinguishes Albert’s and Mike’s cultural knowledge from the other boys is their desire to use problem-solving skills, not just to problem solve and improve in a game but as a means to extend knowledge to others.

Before continuing the discussion of my findings and linking them to research conducted by well-known psychologists Piaget (1972) and Vygotsky (1978), it is important to note a major gap in the literature. Both of these psychologists acknowledged the lack of studies

in cultural knowledge, and cognitive development in adolescents, as their work concentrated efforts on children. Even though this gap exists, it is still useful to draw on their work. Although Piaget's (1972) was a boys' only study and is considered somewhat controversial now, his work sheds some light on how children use reasoning powers independently through experimentation prior to indulging in social interactions. Having said that, there were certain instances when Albert demonstrated a formal exchange of information through collaboration with Jeffrey when they played a video game together. This formal exchange resembled an interdependence or co-operation using simultaneous directions. Furthermore, Albert's and Jeffrey's mutual support for each other demonstrated the capacity to reach a semi-formal social dynamic, which helped to heighten their aptitude (Piaget, 1972) for playing the game, but lacked the social bonding aspect, which is a strong condition for collaboration. This mutual bonding was significant in the cultural experiences of gameplay sequences between Mike and Brian.

Social dynamics were demonstrated in my study, occurring in different forms with Jeffrey, Mike, and Brian. Recall Jeffrey who played video games online using surrounding networks of random players. He found that he could not work or co-operate with random players, even though he tried because the social aspect was missing. For Jeffrey, playing with friends was an important aspect to his cultural gaming experiences because he knew their play style and had fun sharing ideas and questions with them. Well-known clinical psychologists (Piaget, 1972; Vygotsky, 1978) have suggested that children develop certain behaviors to guide themselves. They organize their own activities, within a favourable environment, to fit a social form of behavior to succeed. Brian's approach to cultural knowledge was similar to Jeffrey's in the sense that he preferred sharing exciting moments with others during these social interactions. Brian called these moments positive fleeting interactions, found in the learning – sharing moments domain. He also explained that peers offer support and are the best training partners. Brian's demonstration of video gaming as having a social impact on his learning mirrors Steinkuehler, Squire, and Barab (2012) findings, advancing Vygotsky's (1978) movement about socialization, when they argued "consistent with the sociocultural approach, it's equally important for researchers and theorists to understand the socially situated nature of gameplay." This view coincides with Gee's (2007) perspective of

building “affinity spaces” (p. 91). Although affinity spaces relate more specifically to online gaming, Gee’s views also apply to video gaming in the same way, as evidenced by Brian’s perspective about playing with a human, which provides more depth to learning rather than just playing against a computer. Gee (2007) argued,

Players can play alone against the computer or with and against other human players. Whether they play alone or together, the enterprise is social since almost all players need to get and share information about the games in order to become adept at playing them. (pp. 91-92)

These actions are echoed by Steinkuehler (2006) and Taylor (2006) when they identified video gaming “to be a deeply social enterprise” (p. 20). Peers supporting peers is congruent with Vygotsky’s (1978) theory of the zone of proximal development, which relates to how children imitate each other in an activity or by following a demonstration. Brian and Mike both focused on working with peers and friends to learn from each other, thus predicting or understanding psychological aspects by collaborating with more capable peers (Vygotsky, 1978). The zone of proximal development (Vygotsky, 1978) includes peer demonstrations, which is directly related to how Albert gained his social interaction through demonstrating video gameplays and strategies to surrounding network online players. Furthermore, social activity emerging as a cultural theme from this study parallels the collaborative, socialized activity of teams of over 200 students playing a video game for one day in an Amsterdam study (Huizenga et al., 2009), as they guided and collaborated with each other in order to actively learn.

A commonality in the findings among Albert, Jeffrey, Mike, and Brian is their interactions with friends, other online gamers, and team members. Mike, Brian, and Jeffrey, interacted directly through peer-to-peer support activities, playing with each other to build and actively co-produce cultural knowledge. However, Albert’s interactions differed from the others. As an interdependent team member, Albert often played Team Fortress, choosing characters such as medic or an engineer to help instruct the team. In addition, Albert built cultural knowledge through his video demonstrations, which involved a certain amount of collaboration. The transfer of knowledge is an indirect social method to exchange information with others who shared a common

affiliation with the video games (Cope & Kalantzis, 2009; Gee, 2007). Therefore, Albert shared cultural experiences with others through these demonstrations (Vygotsky, 1978). Albert tended to focus on using online surrounding networks such as YouTube in order to facilitate these demonstrations, and often showed his friends different things he built when he played Minecraft. Albert's way of demonstrating his cultural knowledge about video games relates to the way both boys and girls can gain satisfaction from teaching others how to play (Olson, 2010).

Mike, Brian, and Jeffrey, and in some cases Albert, showed a continuous cultural pattern of social engagement with friends or peers. Researchers (Gee, 2007; Lankshear, 1997; Steinkuehler, Squire, & Barab, 2012) have suggested that positive reinforcement for learning can occur when individuals work together, socialize, receive feedback, or encouragement from peers or friends. The boys' communication pattern was consistent throughout their gameplay as they relied on each other to learn and exchange ideas. These actions are in agreement with Gee's (2007) findings that highlight the social aspect of video games, whereby players construct meaning. Gee (2007) also explained the social affinity of playing video games as "their characteristic social practices, and the sorts of identities people take on within these groups and practices" (p. 43). Gee (2010) argued that,

Knowing how to read or write a game faq (a strategy guide for a video game) requires knowing how game faqs are used in the social practices of gamers, practices that involve much more than just reading and writing. It requires knowing how gamers talk about, debate over, and act. (pp. 19-20)

The actions and responses demonstrated by Mike and Brian revealed an emerging theme of peer mentoring and collaboration. Although Brian and Mike were typical gamers, showing much enthusiasm, and even appearing, at times, to be in competition with each other during their tournaments, they always found the time to provide guidance, and peer-to-peer teaching to other players. In this way, Brian and Mike could help other players familiarize themselves with learning the game. Peer mentoring supports Steinkuehler,

Squire and Barab's (2012) claim that, "people get encouragement from an audience and feedback from peers, although everyone plays both roles at different times" (p. 144).

The boys indicated that they preferred working with peers and friends they know, rather than with random online players. Moreover, Mike and Brian demonstrated this preference for bonding and socializing during their video game playing sequences, by physically sitting close together, cheering, dancing, clapping their hands, and encouraging each other. When Albert and Jeffrey recounted their video gaming experiences with friends, they also shared how they built relationships, helping the team and each other. These forms of social interaction support Vygotsky's (1978) theory that learning is an external process.

Prior studies also demonstrated that boys cultivate their cultural meanings through social dynamics. One such study determined how youth, particularly boys, are motivated socially to play video games (Olson, 2010). Jansz (2005) also found that adult males were significantly motivated to play in large-scale video game tournaments based on socially driven interests, rather than for competitive reasons. Although a literature gap exists with these studies in that Jansz (2005) did not focus on adolescent boys, it provides some insight into my study findings.

Mike, and specifically Brian, created cultural meanings by playing video games with peers who were perceived as the best training partners in the training partners' domain. This phenomenon was also evident in Ito et al.'s (2008) study of 800 youth, which found that most youth engage in video gaming to connect with others as a means to socialize with friends and learn from peers. Mike and Brian would often disrupt tournament matches to give peers chances to learn new strategies. In this way, they transformed their video gaming practices into tangible ways of mentoring each other (Steinkuehler, Squire, & Barab, 2012). Their desire to facilitate and mentor others with their acquired knowledge demonstrated their active participation within their video gaming surroundings, such as the after-school video club. As active members, they found opportunities to produce their meanings and share with others (Alexander, 2009; Gee, 2003, 2007; Gros, 2007).

Mike and Brian privileged mentoring their peers over the actual competition, and their actions resembled those of students in Huizenga et al.'s (2009) study who worked together in teams in a virtual reality game. Mike and Brian's active theory making demonstrated their willingness to collaborate and socially interact with each other, thus contributing to the ways they actively learned and gained knowledge from each other (Vygotsky, 1978). They also demonstrated literacy skills associated with developing strategies and decision-making (Alexander, 2009). Mike and Brian's conceptualising highlighted them as resident experts (Cope & Kalantzis, 2009) who demonstrated their way of thinking to others (Steinkuehler, Squire, & Barab, 2012).

Mike specifically referred to the many times he would play video games at home with his friends, bonding and socializing with them, talking about different things, not just video game related. Engaging in conversations with friends while playing video games relates to Vygotsky's (1978) suggestion that in the first stage of cultural development, children create meanings through their own system of social behavior. Albert's cultural meanings represented his sense of flexibility and sensitivity to others' needs. Through his choices of video game characters, Albert helped the team when needed and in doing so, he showed a responsiveness to others. Albert interacted with team members in a helpful way, which relates to Vygotsky's (1978) theory of children planning their activities by enlisting the help of another person to solve problems. Jeffrey developed his cultural meanings from his experiences of playing video games mostly with friends. It was important for Jeffrey that his friends played the same video games with him in order to have conversations with them. Jeffrey felt that by sharing moments, such as talking about the games, plots, and characters, and expressing opinions with friends, he would know them well enough to share common goals or to use their cultural and social differences as strategic resources (Gee, 2007). Cultural meanings made by Brian also included sharing moments about games in the training partners' domain. Both Mike and Brian exhibited cultural patterns of shared moments when they socialized at the after-school video club. The cultural theme of social dynamics also emerged when they attended Super Smash Bros. Melee tournaments. At these tournaments, they collaborated and experienced the socially situated nature of this type of video game to get better at their video game strategies and to learn from each other (Steinkuehler, Squire & Barab, 2012).

Jeffrey, Albert, Brian, and Mike associated their cultural knowledge with sharing moments with friends during these social interactions, found in the learning – sharing moments' domain. Jeffrey extended his cultural experiences by means of storytelling, which is a way of socializing his experiences through his narrative and socialized levels of speech (Piaget, 1972; Vygotsky, 1978). Similarly, Brian, and Mike shared this pattern of socialized talk about their video gaming experiences with whomever was willing to listen, relating to the ways that children use signs and words as a means of social contact with others (Vygotsky, 1978).

More importantly, the boys associated patterns of emotional connections and meanings about their cultural experiences. Jeffrey experienced cultural insights when he played *Never Alone (Kisima Innitchuna)* and emotional reflections when he played *Valiant Hearts: The Great War*. In a sense, these cultural experiences parallel Jenkins' (2006) findings that video games offer players compelling emotional experiences because the animated stories, designed with interactive components, expand the storytelling experiences for players. Playing these types of narrative video games allowed Jeffrey to make meanings and share and compare perspectives and analysis with friends by probing them with questions as to why events happened in video games. In addition, Mike, and Brian showed similar patterns of recounting their emotional experiences when they played an experimental video game called *Undertale*. These types of video games are interactive so that the player may form attachments to characters and explore meta ideas. These games push the boundaries of video games, and the boys played these games and discussed or conveyed ideas about their experiences with friends. For example, they discussed how they felt about emotions, questioned experiences, and shared moments. This level of interactive storytelling (Beach et al., 2006) and active reflectiveness (Alexander, 2009) or engagement with characters to experience emotion, was significant among the boys in my study. Exploring emotions in video games, as experienced by the boys in my study, also relates to internal cognitive processes of learning such as the emotional sensory capacity of humans as they interact with each other (D'Andrade, 1981; Geertz, 1973). These types of video games, according to Jenkins (2002), offer flexibility and interactivity where players are presented with challenges to move through the narratively impregnated *mise-en-scene*. This also suggests how experimental video

games helped Brian to explore emotion and to evaluate, assess, and express his ideas, thus building cultural knowledge. The games that connect players into the virtual world create an immersive experience that is “emotionally compelling for the player” (Squire, 2013, p. 110). This immersive experience was demonstrated by Brian who associated many of his cultural game playing experiences in terms of the emotional boundaries of a game, expressing ideas and feelings and what he thought about characters.

The boys, Albert, Jeffrey, Mike, and Brian all shared a cultural pattern within the learning – sharing moment’s domain. They referred to and associated cultural meanings with strategies, plot and storylines, characters, and even emotions experienced when playing different video games. They also socially interacted with peers through oral discussions by sharing ideas (Vygotsky, 1978) about their video game experiences, actively learning as they played. Mike and Brian especially associated meanings of emotion by sharing these fleeting, positive interactions during gameplay sequences with friends and peers. This type of stimulating oral discussion resembled a favourable environment of co-operation of individuals which can influence the role of discussion, mutual criticism or support, and problems raised because of these exchanges of information (Piaget, 1972).

One of the themes demonstrated by Albert, Jeffrey, Mike, and Brian was the way they applied their knowledge in real world situations, and shared their opinions reflectively (Cope & Kalantzis, 2009). Their reliance on intrapersonal abilities, relating to the individual’s thoughts, became less important among friends when they openly guided peers and shared stories or strategies, demonstrating their seamless transition to interpersonal functioning (Vygotsky, 1978) in their cognitive development. Mike, Brian, and Jeffrey demonstrated informal techniques of building social dynamics, whether about strategies, competing against other opponents, or understanding the storylines. Jeffrey also distinguished his need to collaborate on stories or ideas with friends and individuals that he had established relationships with. Mike and Brian, however, were more flexible and willing to collaborate face-to-face (Finn, 1999) with random partners assigned to them in tournaments. This also relates to some suggestions made by Gee (2010), who argued, “that participation in the practices of various social and cultural groups determines which experiences a person has and how they pay attention to the elements of these experiences” (p. 27).

5.1.4 Cultural and cognitive knowledge—visual spatial learning.

One of my sub research questions, Do, and how do, video game usage and surrounding networks act as contributing factors to boys' cultural knowledge and use of literacy skills? is addressed in this section. A distinguishing factor among the boys was how they co-constructed cultural knowledge. Part of their analysing process was derived from the way they played video games independently, using logical patterns of reasoning through problem-solving and strategies (Cope & Kalantzis, 2009). They also demonstrated ways of applying their knowledge processes by sharing those meanings and cultural experiences to build cultural knowledge. Much of this sharing of ideas emerged through their verbal literacy skills, or oral discussions, talking to each other, and talking with friends (found in various domains such as training partners' domain, learning – sharing moments domain, and cultural insights – environment domain.)

For example, Jeffrey developed his cultural knowledge of literacy through his analysis of plot, characters, and probing friends with questions as to why events happened in video games. For Jeffrey, cultural knowledge was associated with his reflectiveness on his learning style and he classified his cultural experiences by attempting to understand the significance and meaning behind a story. Researchers (Hommel, 2010; Sanford & Madill, 2007) found that complex multiliteracies skills, such as critical thinking, problem-solving, decision-making and intertextuality are combined in one activity during video gameplay.

Jeffrey critically analyzed and evaluated his own and other people's perspectives by talking about strategies, plot, and storylines. Jeffrey classified his experiences by talking about plots in storylines and by posing questions with friends to gain a deeper understanding or critically analyze events that took place. Jeffrey did not focus efforts on competing with others, but was more interested in the story or telling a story, representing the way he developed his cultural knowledge when compared to the other boys in my study. Jeffrey was a storyteller, and his high degree of reflexive responses to video games demonstrated his awareness of depth and content, and not just a desire to be competitive. This heightened awareness supports some of the ideas suggested by Alexander (2009) and Van Sledright (2002) who suggested that students combine intertextual skills when

analyzing images for their knowledge construction. Although the boys distinguished their game playing experiences and cultural folk terms somewhat differently, in contrast, Jeffrey's experiences were the most significant in contrast.

5.1.4.1 Verbal literacy or storytelling

Verbal literacy or storytelling actions classified all of Jeffrey's cultural experiences. Recall from Chapter 4 that Jeffrey wanted to talk about stories to whomever would listen, and his video gaming preferences directed him to this aim. He found the narrative non-linear interactive video games most meaningful to him (Jenkins, 2006). The adventure narrative type games, such as *The Last of Us* or *Valiant Hearts: The Great War*, were specifically meaningful and of great interest to Jeffrey because the plots were based on historical events. He constantly analyzed historical events from video game plots and shared those ideas with others through discussions and probing questions with friends.

Jeffrey, Mike, and Brian relied much more on verbal skills to build their cultural knowledge, and although Albert mostly worked independently, at times he did develop cultural meanings by sharing and demonstrating what he had learned with others. In this sense, their actions challenge research conducted by Gurian and Stevens (2010a, 2010b) who argued that boys use more symbols in their learning, such as measurements, referring to spatial skills found in the right hemisphere of the brain, relying less on verbal or writing skills associated more with the left hemisphere of the brain. Those findings are in direct opposition to the patterns of behavior and knowledge construction experienced by some of the boys in my study. If my study replicated Gurian and Stevens' (2010a, 2010b) study it may not indicate the same results. Other ways Jeffrey demonstrated his out-of-school literacy skills was by being a storyteller, displaying his competencies by drawing on the concept of oral language—in particular narrative forms for his meaning-making about video gaming experiences (Beach et al., 2006; Cope & Kalantzis, 2009). Steinkuehler (2007) explained that some video games are connected to literacy skills in the ways that they offer players “in-game “orally delivered” narratives” such as “another form of reading and writing” (p. 193).

Jeffrey's keenness to play narrative-based games confirmed his interest in storytelling, situated his learning processes, and allowed him to critically understand the narrative

content. Jeffrey relied on paratexts for details in games about the background story, context, and history (Apperley & Beavis, 2011; Jenkins, 2006). When Jeffrey demonstrated storytelling in his video gaming practices, primarily borrowing the oral language modality within the linguistic design (Cope & Kalantzis, 2009), he moved toward what Alexander (2009) called literacy reflectivity and transliteracy connections, where the learner moves beyond the surface gaming technique and engages with the context of the game. Jeffrey also connected with the environmental storytelling of these types of video games because of their connection to specific genres such as history. Jenkins (2002) explained that video games embedded with literary genres provide players with a much more immersive and compelling representation of their narrative worlds. Steinkuehler (2007) ascertained that when meaning makers interact with video games, they rely “on textually produced verbal interaction and, therefore on story-telling” (p. 195).

Jeffrey's experiences also relate to 'Julio' from Steinkuehler's (2010) longitudinal study, who played narrative-driven games about historic events. Julio's out-of-school literacy practices involved playing these video games and sharing his experiences with peers, relying on paratexts by using external online resources to check facts for his novels and to frame his meanings (Apperley & Beavis, 2011). Jeffrey's social collaboration and meaning-making reflects Steinkuehler's (2007) view of how “individuals adopt and adapt designed-in elements of the game narrative to craft their own 'oral' story-telling performances” (p. 193). Researchers, such as Finn (1999), Gee (2007), and Lankshear (1997) also found ways boys applied their understandings through oral discussions. Clearly, Jeffrey's focus on oral verbal skills as a stimulant for his learning demonstrated his reliance on the left hemisphere (verbal, reading, and writing) for his meaning-making and less on spatial learning (visual moving pictures), which contradicts Gurian and Stevens' (2010a, 2010b) findings that the latter was a learning preference for boys.

In so far as visual learning aspects, the boys did refer to ways of learning through interactive video games which supports Schroeder and Kuriansky's (2009) research that found that boys' cognitive development emerges more often when they use pictures and moving objects (Cope & Kalantzis, 2009). Albert's activities with video gaming showed the strongest tendency to support this claim. Although his practices did not seem like a

direct connection to literacy skill development, Albert used implicit approaches, such as focusing on the semiotic systems in the video games and shifted from one available mode to another within the video game. He relied on visual representations to make connections and understand meanings, rather than relying more on pictures than on text (The New London Group, 2000) to develop those skills, clarified by his focus on character exploration, problem-solving, map reading, and detailed plot recollection. Although Albert's focus on map reading and problem-solving were particular to this context, they also resemble participant activities observed by Huizenga et al. (2009). Albert's actions and responses showed persistence with problem-solving, appearing to be very patient, quietly concentrating, at least for the video games he chose to play at the community centre. Albert appeared to use different strategies in his play style, so he could achieve his goals (Gee, 2007). In order to create meanings and advance his learning processes, Albert used options of integrated images. He engaged with these different multimodal elements to make meaning (Beavis, 2012), drawing on available designs (see Table 3), such as visual representations (objects, moving images, lights), gestural representations (moving the object by using the mouse and watching with his eyes), and spatial environment (understanding the layout on the screen, different frames) (Cope & Kalantzis, 2009). Albert also drew upon spatial representations (Cope & Kalantzis, 2009) during his meaning-making by increasing his awareness of the layout, territory, landscape and general background of a game. These spatial representations contribute to different ways of thinking about literacy (Gros, 2007; Gumulak & Webber, 2011; Jenkins, 2002; Sanford & Madill, 2007). Prior to playing certain multiplayer competitive type games, to gain an understanding of the game, Albert reviewed specific background settings in the video games. He intensified his sense of experiencing the new (Cope & Kalantzis, 2009) from the context of his video gameplay by choosing to review maps within a game to assess and anticipate any need for problem-solving and protecting areas or threats as requested by other online players (Alexander, 2009). Albert drew on these spatial representations to design and construct new meanings, and help problem-solve and strategize. Albert's actions echoed Huizenga et al.'s (2009) study involving students working in teams—some physically navigating around the city with mobile phones receiving maps and text messages to find points of interest while other classmates worked on main computers sending out those messages.

5.1.4.2 Co-constructing knowledge

Jeffrey, Mike, and Brian all showed strong tendencies of co-constructing knowledge through their reliance on oral discussions, which does not entirely support the suggestions made by Blum (1997) that boys' brains crowd out verbal processing. It is important to note there is a literature gap in the age-level of the studies by Blum (1997), Gurian and Stevens (2010a, 2010b), and Sax (2005), which appear to focus on boys just prior to puberty. This may or may not be a factor, but it is interesting to recognize that my study involved adolescent-aged boys (14-15) and that they gained much of their cultural knowledge through verbal literacy skills and social dynamics while playing video games. Brian expressed his critical literacy skills by interpreting and sharing stories with peers. Brian took his literacy skills to another level by using his in-depth analytical skills to explore psychological or emotional concepts. He not only assessed game narratives, but also expanded on his own ideas to develop complex theoretical game concepts. Both Mike and Brian's co-construction of knowledge and exploration of psychological concepts demonstrated their awareness of the game and reflexivity, further validating claims made by Hommel (2010) and Van Sledright (2002) who argued that these, combined with other intertextual skills, validated subject criteria. Although Van Sledright's (2002) study involved fifth grade students, the findings revealed that "all appeared more adept at analyzing the documents and images ... Intertextual on-line comments regarding the documents and images increased from 17% of the total number of vocalizations in the initial task to 41% in the end-point task" (p. 143).

Mike played *Undertale* regularly to improve his literacy and decision-making skills. Mike explained that he read external resources to determine better decisions for outcomes. Mike's immersion with complex multimodal elements demonstrated his competency in terms of interacting with the storyline, characters, and strategic decision-making (Jenkins, 2002). He also transferred his experience with building skills to other problem-solving games, spatially understanding the complex layout designs of the different worlds, different frames, options, and outcomes (Cope & Kalantzis, 2009). Mike recognized how the immersive quality of the game created an emotional connection (Jenkins, 2002; Squire, 2013), thus enhancing his overall learning experience. Mike's meaning-making with this video game reflected an experiential approach to co-construct narratives by

immersing himself in the video game design elements as he interacted with the characters, and deconstructed and reconstructed the game narrative plot (Jenkins, 2002; Squire, 2013). Mike's cultural associations reflect suggestions made by Squire (2013), Steinkuehler (2010), Gee (2007), and Jenkins, (2002), that popular games designed with storylines offer video game players experiential learning spaces to think with complex tools and resources for complex problem-solving (Squire, 2013). In addition, although Mike generally relied on speech and words for his learning processes, his listening skills were equally important and are a key part of the meaning-making process according to The New London Group's (1996) and Cope and Kalantzis' (2009) multiliteracies theory of redesigning processes. Mike made meanings based on the ways he organized ideas, thoughts, and critically reflected options when he interacted with the characters (Alexander, 2009). His actions suggest his overall ability and responsiveness to strategies and decision-making.

Mike recognized how the immersive quality of the game created an emotional connection (Jenkins, 2002; Squire, 2013), thus enhancing his overall learning experience. Undertale also includes multiliteracies interactive functionality, where players assume character roles and activate empathy for the other characters in the game. Meaningful learning experiences emerged for Mike through playing this video game when he made emotional and cultural associations with a character he called mom. Mike recognized how the immersive quality of the game created an emotional connection (Jenkins, 2002; Squire, 2013), thus enhancing his overall learning experience. These game-based immersive approaches help to create "an emotionally compelling context for the player" (Squire, 2013, p. 110). Further to this point, Squire (2013) argued that good games connect players emotionally and invite them "into a world that is to be a learner" (p. 110). The way Mike interacted with the game's various embedded semiotics, such as sound, images, movement, and speech, demonstrated his ability to read, listen, choose, process information, and redesign his meanings (Cope & Kalantzis, 2009; Hommel, 2010; Rowsell & Walsh, 2011).

Many of Mike, Brian, and Jeffrey's cultural experiences, in the form of social dynamics and peer support or bonding with friends, were actively supplemented with socialized speech patterns in the form of oral discussions (Vygotsky, 1978). Such patterns challenge

researchers' claims that boys rely less on verbal activities (Blum, 1997). Albert, Jeffrey, Mike, and Brian's reliance on oral discussions as a means of communicating and applying cultural knowledge is directly related to how children's intellectual development occurs when speech and activity are fused (Vygotsky, 1978). Mike and Brian used socialized language as a way to communicate (Vygotsky, 1978) and they shared video gameplay strategies by creatively applying their new ideas with others (Cope & Kalantzis, 2009). This externalized form of activity (Vygotsky, 1978) became a preferred way of increasing their culturally shared knowledge. While Mike and Brian spoke about strategies, video game plots, or characters with friends, Jeffrey was more sophisticated in his use of language through his storytelling capabilities. Jeffrey told stories and probed his friends with questions as cognitive and communicative functions of language (Vygotsky, 1978). The boys showed strong reliance on oral discourse to build and co-construct cultural knowledge (Gee, 2007). Jeffrey's primary borrowing of available designs was linguistic, generally oral storytelling, and auditory, with a secondary focus on visual, gestural, and spatial representations (Cope & Kalantzis, 2009). At times, the surrounding online communities of practice allowed Jeffrey to share his redesigned meanings with other players (Sanford & Madill, 2006; Steinkuehler, Squire, & Barab, 2012; Vygotsky, 1978). Jeffrey participated in these online communities of practice as online forums, chat sessions among online players occurring within a video game. For example, through his participation and membership in these various online spaces, Jeffrey actively built his literacy and discourse skills, such as storytelling, listening, critically reflecting and responding to others (Alexander, 2009; Beach et al. 2006; Beavis, 2012; Gee, 2003, 2007; Steinkuehler, Squire & Barab, 2012). The sociocultural context of online communities of practice invites players to engage in forms of multimodal textual play. Steinkuehler (2011) suggests that these online discourse communities provide players with opportunities for "interpreting and understanding print text" (p. 4). In this sense, higher reliance on visual spatial aspects of the game were apparent. Albert interacted with others in these surrounding online communities of practice to reinforce gameplay actions, explanations, and problem-solving with peers (Alexander, 2009; Gros, 2007), while Jeffrey focused more on the background context of the story, questioning why certain events occurred (Alexander, 2009, Hommel, 2010; Jenkins, 2006; Van Sledright, 2002).

Jeffrey connected meaning to his game playing experiences by classifying the culturally rich non-linear storyline (Jenkins, 2006) rather than the competitive strategic significance associated with Mike's and Brian's experiences. Both Mike and Brian relied on exchanging ideas about those strategies by talking with partners, peers, and friends. The boys' cultural video game experiences became meaningful to their co-construction of knowledge. Their exchange of ideas about video games and gaming experiences was a method of communicating. This observation aligns with Jansz' (2005) finding that face-to-face exchanges of information about gaming experiences increased the motivation of players.

Albert, however, appeared to be highly motivated by independent video gaming experiences, often playing *Minecraft* or *Portal 2*. Similarly, Jeffrey independently played *Never Alone (Kisima Innitchuna)* to learn about Alaskan heritage before suggesting that others play the game with him, so they could discuss ideas about it and share opinions about the stories or historical events. Both Jeffrey and Albert showed strength in developing their sense of cultural knowledge independently, before transitioning to a collaborative focus to share their thinking processes with others (Cope & Kalantzis, 2009). Independent learning prior to collaborative learning mimics how children acquire independence in cognitive development through internalizing practical steps, guiding themselves, then moving to an interpersonal function of organized activities in relation to another person (Vygotsky, 1978).

5.1.4.3 Critical literacy skills

Albert, Mike, and Brian demonstrated strong interpersonal activities in their choices of video games, with Albert selecting team member roles in multiplayer competitive games such as *Team Fortress* and Mike and Brian preferring video games such as *Super Smash Bros. Melee*. Albert focused his efforts in helping the team whereas Mike, and Brian used these cultural experiences to work with partners, critically analysing and reading opponents, predicting moves, and analysing the psychological aspects of other players' strategies (Cope & Kalantzis, 2009). Mike explained "like psychological aspects, there's technical, you just have to have this prowess like ... reading your opponent ... Predict what they're gonna do." In his active theory making, Mike developed a mental model

about reading his opponents, which he actively used to interpret the play strategies. For Mike, close reading and predicting of his opponents demonstrated the way he drew distinctions between his actual experiencing of the gameplay instances and his conceptual theory (Cope & Kalantzis, 2009). In this way, Mike engaged in critical reflective inter-textual literacy skills by drawing on his prior knowledge and developing a conceptual framework to question, interpret, and infer new meanings (VanSledright, 2002). Mike's conceptualising process involved first naming the cultural concept "psychological aspects" then engaging in practices to theorize the concept. Mike was interested in players' behaviors and their cognitive motivations during gameplay sequences. In this way, Mike demonstrated his cognitive ability in what Vygotsky (1978) referred to as blending of "practical and abstract intelligence" (p. 24). Mike was methodical in his process of evaluating players and predicting their moves by finding opportunities to observe them, such as choosing a human partner over a computer-controlled player. To build his knowledge and interpretative skills of what he observed, Mike also borrowed from paratextual resources by learning about the technical mechanics of characters and how they operate within a game (Apperley & Beavis, 2011).

Jeffrey focused on rich storylines in video games such as *Valiant Hearts: The Great War*, and his strength in oral storytelling to question historical events (Jenkins, 2002), trying to reflect on what happened and probing friends with questions. These reflective practices were a recurring pattern among the boys and is related to similar findings by researchers (Alexander, 2009; Hommel, 2010; VanSledright, 2002) who found that students developed a degree of literacy reflectivity in video games by playing with others players and communicating with each other to critically think about strategies. Jeffrey recognized that the game included complex forms of literacy, represented by the narrative component and the events within the plot which emotionally engaged the player (Jenkins, 2006; Steinkuehler, 2007). He also made further connections to emotion-based stories in his explanation of his experience playing *Valiant Hearts: The Great War*. Jeffrey's experience playing these adventure games contributed to his interpretation of visual images, characters, and the storyline, which he associated with a range of cognitive functions—both learning and emotion (Duncum, 2004).

Mike, Brian, and Albert all demonstrated high energy and keen motivation to mentor peers by applying and transferring their knowledge to new settings (Cope & Kalantzis, 2009). Mike, and Brian often stopped during video game tournaments to help other players with strategies, instructions to play the video game, and explanations of the significance of character tools. Albert supported his friends and peers through gameplay, relying on visual moving images by creating YouTube walkthroughs or showing friends what he built when he played Minecraft. He fused interpersonal abilities with oral discourse and collaboration. For example, when Mike and Brian actively collaborated via face-to-face activities, they also mentored each other, and in this sense, their activities differed from visual spatial learning claims. The strongest activities emerging from their cultural knowledge was how they approached their experiences and made meanings. They emphasized oral communication rather than written skills, differing from prior studies indicating boys favour of spatial learning found in the right hemisphere of the brain (Gurian & Stevens, 2010a, 2010b), compared to girls who possess a verbal edge (Blum, 1997). Past research has shed some light on how the boys constructed cultural knowledge based on a preference for and concentration on games involving interaction and moving pictures.

Researchers (Apperley, 2010; Gee, 2007; Sanford & Madill, 2007; Steinkuehler, 2010; Steinkuehler & King, 2009; The New London Group, 2000) also found that boys focus and concentrate on symbols and moving images as a way to learn. Signs and words serve as children's first method of cognition (Vygotsky, 1978). Children respond to symbols and objects through action and speech, which is referred to as syncretism in perception (Vygotsky, 1978) where thought is based purely on what is perceived. Children then use language and symbols, interaction, questioning, and reasoning powers to make associations (Piaget, 1972). The boys shared a common pattern of choosing experimental, narrative-based and interactive video games to make meaningful connections, analysing through reasoning skills by accessing different sensory processing in their cognitive development, such as emotions, (Cope & Kalantzis, 2009). Jeffrey built his cultural knowledge by making meaningful connections using video games with non-linear storylines (Jenkins, 2006). By questioning historical events that occurred within plots, Jeffrey reflected on the emotional depth and sadness he felt while playing certain video

games, such as *Valiant Hearts: The Great War*. He also associated cultural insights, found in the cultural insights - environment domain, when he played the interactive video game called *Never Alone (Kisima Innitchuna)*. Jeffrey's cognitive reasoning links to his interactions with video game characters and storylines. His overall perception and meanings gained from exchanging those ideas with friends, mirrors previous findings of how video games integrate complex elements including: language, literacy, affect, and social interaction in ideas about learning (Ajayi, 2010; Dietz, 1998; Gee, 2007).

5.1.4.4 Cultural experiences

Mike also created meaningful associations from playing *Undertale* because, as he explained, it teaches analytical skills. His cultural experiences playing this game allowed him to discover fine, small details, even secrets in order to make decisions for different outcomes. Mike gained his multiliteracies skills, such as predicting, thinking ahead, and problem-solving, from playing a variety of video games, such as *Legend of Zelda* and *Super Smash Bros. Melee*. In playing these games, Mike concentrated on building strategies with partners, including being resourceful and creative, by developing his own language and reasoning skills to use during tournaments to enable quick decision-making. He focused more on what would happen after making decisions, rather than focusing on the game's storyline or the points involved (Foster, 2009). These activities suggest that Mike strengthened his problem-solving skills by using the video game as an experiential learning space where he could utilize the complex tools offered in the game (Alexander, 2009; Gee, 2007; Gros, 2007; Squire, 2013).

Mike and Brian also gained cultural experiences when they played *Super Smash Bros. Melee* by analyzing and classifying characters into skill and tool levels so that they were aware of potential choices and how these characters would respond in different ways in the game to achieve certain strategic goals. Brian, like Mike, preferred highly interactive experimental video games such as *Undertale* to push emotional boundaries for players in a game. A meaningful experience for Brian was to explore meta ideas in games, rather than just use a puzzle platformer game to learn to solve problems, as Albert usually did. This mix of visual, critical thinking and interactivity relates to Alexander's (2009) findings that games use a variety of complex literacy skills by integrating a complex use

of multiple modes of writing and visuals and a need to develop a sense of how text and visuals interact. Brian also made associations with narrative-focused video games, which were highly interactive (Annetta, 2010). These types of games, Jenkins (2006) explained, are animated stories designed with interactive components thus expanding the storytelling experiences for players. In this way, these narrative-type video games designed as complex nonlinear media combine multiple arrangements of the content for players to discover (Jenkins, 2006). Brian's preference for games were primarily interactive adventure games whereby players could engage with the narrative game elements to redesign their own narrative performances or co-construct stories (Jenkins, 2002; Steinkuehler, 2007). Additionally, Brian preferred to engage with the immersive quality of games to provide him with emotionally compelling experiences (Jenkins, 2002; Squire, 2013).

Brian's cultural knowledge was developed through his need to explore meta ideas by telling a story, found in the exploring emotions domain and sharing exciting moments about plot and characters, found in the learning – sharing moments' domain. This pattern of sharing ideas also occurred with Jeffrey who constructed his cultural knowledge from his storytelling about the video games he played and probing questions he asked friends. Although Brian focused much of his effort on playing Super Smash Bros. Melee and learning about strategy, he also gained cultural knowledge by talking to friends. Brian focused on having another human to practice with, as he felt peers were the best training partners.

Other researchers, such as Alexander (2009) found that some gamers actively engage in literacy reflectivity. Furthermore, how the boys made connections about their cultural knowledge when they discussed ideas about using interactive narrative and experimental video games, is similar to findings in earlier studies. Researchers such as Beach et al. (2006) found that students played interactive and role-play video games to participate in interactive storytelling by using characters that interact with them. Other researchers (Steinkuehler, Squire, & Barab, 2012) found that when players exchanged ideas about gameplay, they are exposed to one another's thinking, which illustrates the social cognitive learning aspects (Vygotsky, 1978) of video game playing that Albert, Jeffrey, Mike, and Brian experienced. Although there are many instances whereby the cultural

knowledge gained by these four boys directly link to past research on cognitive development by well-known psychologists Vygotsky (1978) and Piaget (1972), a major gap in the literature exists. Piaget (1972) recognized a lack of studies in youth:

We know, however, that the study of the child and the adolescent can help us understand the further development of the individual as an adult and that, in turn, the new research on young adults will retroactively throw light on what we already think we know about earlier stages. (p. 47)

5.1.5 Video games: Gender and violence

Gender. One of the domains that did not show consistency in patterns across the two cases was the boys' perceptions about gender. During the semi-structured interview, when asked the question whether he explored his own gender identity in video games, Jeffrey provided a general critical reflection about video game discourse rather than focus on his subjectivity. Jeffrey challenged the gender bias in video games, claiming strong female characters now dominate games; however, Jeffrey did not indicate whether he specifically chose those female characters. He provided no insight into exploring his own gender identity during his video gaming practices, although he recognized the existence of other genders and value systems within some video games. Results revealed that Jeffrey focused on playing video games, such as *Never Alone (Kisima Innitchuna)*, that represent an Indigenous male child character. At the same time, he thoughtfully described an experience when he played a video game called *Mirror's Edge*. In this game, the protagonist is a female character named Faith. He explained to me that mainstream video game development is now emerging with balancing character genders within the video game storylines.

Even though Albert's choice of characters did not fit the stereotypical masculine characters as found in Sanford and Madill's (2006) study, he challenged this theme by often choosing characters that would help the team. Similar results appeared with Brian and Mike, who consistently selected animal or female characters. When they played a video game using a male character, they would either ridicule or openly state, in front of peers, how its characteristics were weak and had no merit for selecting the same character

for use in a tournament game. Evidence gathered from the results further legitimized their consistent use of non-masculine characters. For example, Mike chose lessor known or weaker characters, to explore and understand their weaknesses so that he could learn to develop their strength. Mike's choices are congruent with conclusions made by Apperley and Beavis (2011), who explained,

Paratexts reveal how digital games take on meanings and roles in students' lifeworlds outside of the immediate "immersive" activity of playing the games themselves. They take the emphasis away from the – often-mechanical – process of playing the game and focus on the contemplative, creative, imaginative and productive elements of digital gameplay, rather than the compulsive "twitch" of constant action. (p. 134)

Toxic masculine behaviors were absent from the results as those behaviors were never exhibited by the boys. Mike and Brian preferred to use animal or non-masculine or feminine characters when they played video games. They explained how they made these choices on a regular basis and were quite open with peers in tournaments and/or public competitions. They provided context in their post-observation interviews by citing reasons for choosing feminine characters as stronger than masculine ones, and generally choosing non-violent options in video games. They also reasoned how their game choices were particular to not harming other characters during gameplay sequences. The only evidence emerging from this theme about gender was with Albert, who admitted to exploring feminine and masculine characters. He explained that he was interested in understanding the abilities of those characters and his understanding would help him to play the game differently or have different responses to the gameplay experiences. He admitted to selecting his gender first then transitioning to a female character. Albert's response challenges Sanford and Madill's (2006) claim that boys tend to "resist traditional school literacies, choosing instead modes of literacy to support the particular type of masculine persona they have selected for themselves, and make a commitment to that self-selected identity" (p. 299).

Jeffrey spoke more about the description of a virtual video game character rather than specific gender qualities. The only real reference that Jeffrey made about gender was when he responded to “Are there ways that you act as a boy at school (do you perform certain masculine traits) that you don’t act at home or while playing video games?” Jeffrey’s response to this question was “Ok ... if something scares me in real life I’m not gonna scream like a little girl like I do in a video game with my friends.” In this way, although Jeffrey did not display overall significance in his exploration of gender or multiple masculinities, he did demonstrate other ways by resisting “toxic” (Connell, 1996) masculinity traits by resisting violence in games.

Neither Mike nor Brian explored different genders of characters; however, evidence suggests they consistently reversed their gender roles while playing video games. Therefore, it is apparent that the boys were exploring varying “modes of masculinity” (Skelton & Francis, 2011, p. 458). For the boys, expressing different forms of their masculinity continues to challenge claims made by scholars about video games influencing negative forms of identity (Alexander, 2009; Connell, 1996; Gros, 2007).

Similarly, neither Albert nor Jeffrey played video games selecting a different gender role from their own gender or expressing outward characteristics of a reverse gender role. Brian exhibited this pattern and consistently selected feminine characters during his gameplay sequences. He did so without any prompts and openly indicated his effeminate nature, suggesting that he did not privilege masculine gender or characters in a video game and did not put efforts into being masculine. Here, Brian defends his choices and behavior by providing context about his personal background. He further downplays any association with potential “toxic” (Mac an Ghail, 1994) masculine behavior, such as aggression or competitiveness in playing games, which further challenges Sanford and Madill’s (2006) findings. The researchers indicated that they, “did not find evidence that learners were thinking consciously and reflecting about cultural models of the world, or that they were consciously reflecting on the values that make up, their real or video game worlds” (p. 300). Brian continuously reinforced his position on gender by consciously reflecting on the lack of female representation and the need to promote this aspect in gaming. He referred to reading a documentary that was created about Super Smash Bros.

Melee and noted that it did not do “a great job of representing its females players very well.”

Similarly, Mike consistently chose animal characters, although not specific to reversing a gender role but still representing non-gendered characters, and indicated that he would not specifically choose a masculine gender. Mike explained that he preferred to choose gender-neutral characters such as animals. This does not really support a strong gender association either way, but he did provide context to these preferences, by indicating that masculinity did not influence his decisions. In this way, Mike was not attempting to use video games as a means to express his masculine identity. Mike and Brian's actions challenge Sanford and Madill's (2006) claim that video games provide players with opportunities “to resist connections to the feminine” (p. 297). He explained, “Well I'm say like, masculinity of a character again that stuff doesn't really affect me. Say like in Melee I don't play fox because he's a fox.” Mike also provided a basis for exhibiting a sensitive form of masculinity by thoughtfully expressing the maternal aspects of a video game, when he stated, “So it's called Undertale, and it's just like a really good experience, because you get really emotionally attached to the creature. You call her mom afterwards ... It's like really emotional.”

These video game skills, actions, and behaviors are somewhat linked to the boys' subjectivity and forms of multiple masculinities, although these links are not conclusive. Their behaviors were not a defined rejection of the masculine ‘self’ but a self-awareness that was celebrated, weaknesses and all, especially in the ways they were inclined not to choose characters stereotypically masculine. Furthermore, the boys did not appear to use video games as a conscious effort to explore or understand their gender or stereotypical masculinity.

Violence. A significant emerging pattern was how the boys openly rejected violence or violent video games. By playing games targeted for younger players, such as Nintendo's Super Smash Bros. Melee, both Mike and Brian made conscious efforts to reject violent video games. Mike provided evidence by specifically admitting to having a phobia about blood and not liking violent video games. Furthermore, Mike and Brian both provided context about not playing violent video games and would not maintain friendships with

peers who preferred these types of games. Similarly, Jeffrey openly rejected playing some video games at the centre because they contained violent themes. His resistance is further justified by his criticism of other players who played these violent themed video games. He preferred playing story-based video games that provided him with knowledge about history or Indigenous cultures.

When Albert played point/shoot video games, the majority of his time was focused on reviewing character details or maps or talking about strategies with peers rather than playing the game. His actions challenge the forms of literacy resistance that Sanford and Madill (2006) associated with video game players, especially boys. They emphasized that boys who play video games, including point/shoot games for extended periods, often form habits of resistance to authority, stereotypical behavior that “limit learning opportunities” (p. 293).

Furthermore, players, like Albert who have extended exposure to these types of video games, may become desensitized to the violent themes and learn “toxic” behaviors (see for example, Connell, 1996; Lingard & Douglas, 1999; Mac an Ghaill, 1994). This reasoning of desensitizing to violent themes in video games ignores arguments highlighted from empirical evidence spanning over 14 years (for example see Sherry, 2001) that examined and found no significant negative impact on behaviors in boys who played violent video games. Sherry (2001) also argued that a correlation exists “between video gameplay and aggression, but that relationship is smaller than that found for television” (p. 424). This is an important revelation, which may suggest television is a higher predictor of aggression than video games; however, this is not the scope of the current study but may be a topic for future study.

Jeffrey, was entirely opposed to using any violent video games, and continuously asked to play the Aboriginal based video game *Never Alone (Kisima Innitchuna)*. Jeffrey’s actions challenge the notions put forth by Sanford and Madill (2006), who claimed that video games provide players with opportunities “to demonstrate their heterosexual masculinity” (p. 297).

Outward rejection of violent video games occurred in 3 of the 4 participants in this study, with the anomaly being Albert who showed a greater preference for point/shoot video games. Mike and Brian rejected violence in video games and demonstrated a preference for kids games, such as Nintendo's Super Smash Bros. Melee. Jeffrey also outwardly rejected video games associated with violence, and showed a strong preference for storyline games, such as *Never Alone (Kisima Innitchuna)*. Findings from Jeffrey, Mike, and Brian further challenge Mac an Ghail's (1994) notion of belonging to a student micro culture, which amplifies a masculine culture through their forms of resistance. Clearly, the boys resisted stereotypical behavior by not fitting into the forms of resistance, as Sanford and Madill (2006) have suggested.

Jenkins (1998) further argued that boys are motivated to play video games, even beyond physical and emotional exhaustion, in order to master a skill, which they determine to be important. This determination suggested a growing video game culture for boys, which Jenkins (1998) understood as a motivation for boys to displace the need for outward physical violence. Jenkins (1998) further explained that this video game culture has "often been criticized for its dependence upon ... scatological images, with the blood and gore" (p. 273). Jenkins' (1998) assumptions and understandings about boys re-examined the theme about boys returning to masculine patriarchal views, and their motivations to be included in this growing video game culture.

Jeffrey's sensitivity to hegemony or misogyny became clearer in the way he actively criticized other players during gameplay. He would monitor peers and remark that they should avoid killing and not hurting other characters when they played violent type video games. During the post-observation interview, he cited video games that he played that were dominated by female characters or the protagonist was a female. Both Albert and Jeffrey expressed repeatedly that they did not believe in playing games that victimize women, but Albert did play violent video games. Jeffrey consistently showed his sensitive nature by reflecting on the devastation in particular games, which was "awful."

Mike and Brian were also resistant and hypersensitive to hegemony and misogyny. Brian provided further context for his position based on the loving and caring home life he has experienced and his resistance was also evident from his effeminate play style. He

preferred characters who did not carry weapons and did not harm other characters in a game. Mike also revealed in his choice of games how he experienced deep emotions. For example, while playing *Undertale*, he repeatedly tried to select the option not to harm a deer like animal character, he referred to as mom, but the option was not working.

These participants indicated that they were not influenced by violence to act in a hyper masculine way, or assume hyper masculinity in their personalities while playing the video games. In fact, quite the opposite. Claims by Lingard and Douglas (1999) that video games influencing masculine behavior, challenge behaviors exhibited by Mike and Brian who were not influenced by “toxic” behaviors. When they played video games, they chose non-violent characters and appeared to exhibit gentle personalities, such as laughing and joking.

Both Jeffrey and Albert also confirmed that they were opposed to playing violent video games which contained misogynist themes. These actions and responses from Jeffrey, Albert, Mike and Brian, challenge the claims by Dill, Brown, and Collins (2008) who argued that extended exposure to violent video games caused greater “rape supportive attitudes” (p. 1406).

Similarly, Albert spoke thoughtfully about acting out hegemonic traits, such as “doing something drastic” or being loud, which would result in consequences he preferred to avoid. Although he did not elaborate on this statement or experience, Albert exhibited an introverted and quiet mannerism, and did not engage in any confrontation with a perceived bully, even during an incident when this person taunted him. Jeffrey also demonstrated a reserved, quiet nature preferring not to interact with the other boys at the community centre and refusing to play the video games in their company. In this sense, the findings challenge research from studies revealing that boys would “disrupt learning” (Connell, 1996; Mac an Ghail, 1994) in different ways by constructing a dominant masculine behavior, such as “Macho Lads” (Mac an Ghail, 1994), or “Anglo jocks” (Connell, 1996).

5.2 Analysis of cultural themes of adolescent boys

The community centre and after-school video club cases illuminated how the boys, Albert, Jeffrey, Mike, and Brian practiced various forms of meaning-making by borrowing from available multiliteracies designs during their video gaming experiences. Their meaning-making was demonstrated in a variety of ways including face-to-face interactions with their online communities of practice and storytelling about at-home activities. Although a longitudinal study was conducted by Smith and Wilhelm (2002) that related to boys and their out-of-school contexts it did not focus on video gaming. By using an ethnographic case study methodology, I gained further understandings about the ways that the boys made meanings in their out-of-school video gaming practices. These secondary learning domains can sometimes appear more privileged by adolescents. Gee (2003, 2007) reminded us that learning and teaching processes can be especially meaningful when experienced in a secondary domain, existing outside of a primary domain where learning would normally occur (such as a classroom or a textbook). By identifying some of the ways that the boys made meanings and by drawing on available multimodal representations and knowledge processes from the multiliteracies framework (Cope & Kalantzis, 2009) (Chapter 4), I do not mean to suggest that these meanings replace primary domains of learning, especially for literacy. For example, Albert (community centre case) produced and published YouTube instructional videos for video game players, which highlighted his innovative and creative skills and extended and applied his cultural knowledge in real world situations (Cope & Kalantzis, 2009). Mike (after-school video club case) played video games with human partners to observe and evaluate their psychological behaviors during gameplay, which showcased Mike to be an active conceptualizer by using these interactions to improve his own knowledge in strategy and decision-making (Squire, 2013). Although I have no direct evidence to support how the boys extended and practiced these knowledge processes in school, their actions and meanings seemed to represent alternative pathways to adopting, developing, and sharing their cultural knowledge.

5.3 Implications for practice: Learning by design

The Learning by Design framework (Cope & Kalantzis, 2016) offers multiple modalities of meanings and a range of knowledge processes so that practitioners will have ease in preparing lessons with multiple curricula objectives and differentiated activities for a broad range of learners. Learners are diverse and bring varying experiences, backgrounds, and values to the ways that they make meaning and produce knowledge. The Learning by Design framework allows practitioners to create pedagogical scaffolds, which do not assume every learner is at the same level (Cope & Kalantzis, 2016). It is a flexible framework, allowing learners to draw from any of the available design modes, such as oral, visual, audio, tactile, gestural and spatial, to make meanings (Cope & Kalantzis, 2009). This framework does not prescribe a correct pedagogy, but rather provides the language in which to interpret and define features around any pedagogy that a practitioner employs. Specifically, the Learning by Design framework consists of a number of concept labels applied to the different stages of a learner's experience (Cope & Kalantzis, 2016). These labels are defined as knowledge processes which Cope and Kalantzis (2016) identify as experiencing (the known and the new); conceptualising (naming and use of theory); analysing (functionally and critically); and applying (appropriately and creatively).

With the adaptable Learning by Design framework, educators can map these knowledge processes directly to curricula objectives in specific subject areas. The Ontario Grade 10 English curriculum (Ontario Ministry of Education, 2007) was an obvious choice for me given my study involved literacy practices of adolescent-aged boys in Grade 10. Table 7 represents a sample of ways to map the multiliteracies framework, Learning by Design, into literacy objectives. It illustrates an example of how the Learning by Design framework can be mapped to curriculum objectives for all children.

Table 7

Learning by Design Framework Mapped to Sample of Literacy Objectives in Ontario Grade Ten English Curriculum.

Knowledge Process	Sample Literacy objectives
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Experiencing the known	Demonstrate understanding of content (Eng2D-1.3)
Experiencing the new	Extend understanding of texts (Eng2D-1.5)
Conceptualising by naming	Oral Communication (Eng2D-1.3)
Conceptualising by theory	Interpreting (Eng2D-1.5); Metacognition (Eng2D-3.1)
Analysing functionally	Reading for meaning (Making Inferences, meaning, organizing ideas) Eng2D-1.4); Extending understanding (Eng2D-1.5); Analysing texts (Eng2D-1.6)
Analysing critically	Demonstrate reflective practices (Evaluating texts - Eng2D-1.7, 1.8)
Applying appropriately	Reflect - Metacognition (Eng2D-4.1)
Applying creatively	Innovate – Interconnected skills (Eng2D-3.2, 4.2)

Table 7 is an example of how literacy curricula can be aligned with the Learning by Design framework. These pedagogical elements can pair with the representational modes of meaning (oral, visual, tactile, etc.) which learners can draw from and educators can assess.

During the analysis of the two cases (community centre and after-school video club), it became clear that Albert, Jeffrey, Mike and Brian demonstrated a number of these knowledge processes as they engaged with their out-of-school video gaming practices. This suggests several implications for educators who may want to integrate alternative resources in the classroom to bridge those practices from secondary learning domains such as video gaming to address boys' underachievement in literacy. Similar to recent studies conducted on multiliteracies, including video gaming practices (see for example, Apperley & Beavis, 2011; Ganapathy, 2014; Gee, 2003, 2007; Sanford & Madill, 2007; Squire, 2013; Steinkuehler, 2007, 2011; VanSledright, 2002), this study suggests ways for teachers to establish new ways and practices for building knowledge by engaging 21st century learners in multimodal meaning-making and knowledge processes, particularly through the use of video games. The findings from this study may also inform classroom

instruction by supporting professional teacher development if teachers choose to develop games aligning to curriculum objectives being taught.

The boys demonstrated experiencing in unique ways. Mike was an active member in his online community of practice (see Table 2), and his membership in peer-based forums represented literacy practices called metagaming (Steinkuehler, 2007). His participation in the community of practice provided him with experiencing the known and the new by sharing ideas or perspectives with peers, developing, reviewing and responding to critical discourses, and sharing meaning-making about theories (Cope & Kalantzis, 2009; Kafai, Burke, & Steinkuehler, 2016; Steinkuehler, Squire & Barab, 2012). Activities such as computer blogging with peers to discuss video game mainstream theories and extend understanding of preserving Indigenous culture, foster oral narrative storytelling knowledge processes, decode and encode the meanings from the moving visual images, explore literacy within the game by using cognitive functions and play styles used in the classroom by teachers can offer opportunities for learners to engage in similar forms of meaning-making. These digital practices would supplement curricular objectives in class and alternative assessment strategies, such as depth of learners' discussions and support of their arguments.

Jeffrey experienced the known and the new in the form of playing and talking about *Never Alone* (Kisima Innitchuna). Jeffrey demonstrated a competent level of understanding of the game and the Indigenous relevance, and explained how the video game offered an authentic experience of the Alaskan perspective through the portrayal of Elders' wisdom and storytelling. Jeffrey made meanings focusing on these "real world patterns of experience" (Cope & Kalantzis, 2009, p. 17), and explored literacy within the game by using cognitive functions, such as decoding and encoding the meanings from the moving visual images, and the Elders' wisdom and storytelling from the embedded videos. More importantly, using authentic culturally-based video games such as these, would provide students with unique ways of interpreting and extending understanding of Indigenous genre, and also provide significant ways to integrate and preserve Indigenous heritage in schools, where cultural diversity may be lacking. Moreover, Jeffrey's interest in oral storytelling connects to the ways he made meanings about literacy. If teachers could create more opportunities for learners to create their own oral narrative storytelling

performances (Jenkins, 2002; Steinkuehler, 2007), then it may help to engage learners in meaningful ways while supporting traditions for Indigenous storytelling knowledge processes.

Mike and Brian conceptualised their meaning-making by using metacognitive skills. Conceptually they named their knowledge processes by identifying and engaging in logical steps to achieve their goals. First, they would find opportunities to play video games with human partners, determined by Brian to be optimal training. Second, they appeared to follow a routine logical process to conceptualize and put their theories into practice. By relying on metacognition for meaning-making, they developed their understanding and perception of gameplay strategies by reading opponents. Their meaning-making involved observing small details, understanding the characters and game functions, identifying psychological aspects of their opponents, and building on these concepts for their own strategies. Such out-of-school video gaming practices resemble ways that learners interpret meanings by developing perspectives and theories about texts and genres. Teachers could create opportunities that could involve peer collaboration, sharing knowledge, perspectives and theories—perhaps through debates or competitions. These types of activities shift the classroom pedagogy to a more learner-directed focus, and transition the teacher to facilitator in the classroom.

Albert developed his conceptual theories by independently playing video games, developing strategies, and building his skills. Once he felt he had mastered his skills, using certain strategies or building through games like Minecraft, he extended his theories to his online community of practice by showing them how to play (Gros, 2007). These activities highlight Albert as an active theory maker (Cope & Kalantzis, 2009) by extending his learning processes with peers (Jansz, 2005). Using video games such as Minecraft may seem like a diversion to learning literacy, but Kafai, Burke, and Steinkuehler (2016) advocate these types of games as they promote meaning-making and invite players to develop skills in designing and creating.

Some of the ways that Jeffrey demonstrated analysing and reading for meaning was through playing non-linear interactive narrative-type video games. Jeffrey analyzed narrative video games functionally by identifying the differences between video games

and novels, explaining that novels provide the same storyline, unchanged, whereas interactive video games provide more engagement with the storyline because players can alter it based on character and plot choices. Jenkins (2005) state that video games represent a unique art form, with participatory story and cinema-quality graphics that unfold during gameplay sequences. Jeffrey demonstrated his understanding and analysis of narrative genres by immersing himself into the game experience and co-constructing the narratives (Jenkins, 2002; Squire, 2013). Jeffrey gained literacy skills by demonstrating his use of alternative texts in non-linear interactive video games (Jenkins, 2002; Sanford & Madill, 2007). Integrating these types of narrative-based interactive video games in the classroom could offer an alternative genre to print-based texts. These non-linear video games also invite learners to be creative in their meaning-making by altering storylines based on their values and perspectives.

Jeffrey demonstrated his critical analytical skills by reflecting on small details about video game plot and characters. In playing *The Last of Us*, he identified a character named Bill and questioned his convenient placement within the plot to solve problems. Jeffrey organized his understanding about storyline plot and characters by analysing meanings and critically framing his understanding of the plot and character connections (Cope & Kalantzis, 2009). Clearly, Jeffrey demonstrated his skills in critically evaluating relationships and developments of characters in a storyline. In this way, the video game offered Jeffrey opportunities to develop his critical perspectives about how the texts work, helping him to identify assumptions built into the texts, such as characters' roles within the storyline, and how this related to his own perspectives and culture (Beavis, 2012; Cope & Kalantzis, 2009). Teachers could introduce narrative-based video games as a way for students to critically analyze storylines and develop perspectives. These activities may provide opportunities for students to become more engaged in a variety of texts and help to anchor their out-of-school interests.

Jeffrey extended his cultural knowledge based on his interest in video game design and history. Jeffrey enrolled in a program where he created iPhone video game applications related to his interest in history and demonstrated his innovative and creative knowledge processes by developing these games (Cope & Kalantzis, 2009). Jeffrey had the ability to analyze small details, including game flaws, and his prior knowledge in this area allowed

him to transfer and extend it to create new concepts (Cope & Kalantzis, 2009; Jenkins, 2002). Jeffrey's metacognitive skills focused on spatial logic and graphic computations for video game design (Cope & Kalantzis, 2009). Introducing learning activities such as video game design in classroom activities could present ways for students to demonstrate their interest, spatial reasoning, and game design proficiency (Beach et al. 2006).

Brian explored metagame ideas such as emotion. Brian's video game preferences focused on experimental games, such as *Undertale*, and multiplayer competitive games such as *Super Smash Bros. Melee*, similar to Mike's preferences. Brian's choice of immersive video games invited him to creatively apply meaningful connections and explore emotions (Cope & Kalantzis, 2009; Squire, 2013). He preferred games that pushed the emotional boundaries, thus demonstrating his metacognitive ability to evaluate, interpret, and express his ideas with others. Brian demonstrated his skills and understanding of emotional boundaries in the ways he thought about characters from playing an interactive narrative video game. Introducing interactive narrative video games in the classroom, such as *Undertale*, may invite students to experience the same type of metacognition as experienced by Brian.

In summary, in this chapter I provided a discussion and analysis of the findings from a multiliteracies perspective. Based on the analysis of these results, I also discussed and provided suggestions by introducing a Learning by Design framework (Cope & Kalantzis, 2016) for practitioners interested in alternative pathways for helping students to build knowledge processes.

Chapter 6

6 Implications for research and limitations

This study provides a basis for further research. Similar to other studies of an ethnographic nature, by methodologically and strategically placing these four boys at the forefront, my exploration attempted to hear boys' voices, as clearly as possible, and provided me with an opportunity to capture some of their real-life activities and unique experiences within two particular settings. Being an ethnographic multicase study strengthened the authenticity of the contextual cultural experiences of these four adolescent aged boys, Albert, Jeffrey, Mike and Brian, who regularly engaged with video games. The use of thick descriptions (Wolcott, 1987) for the boys' experiences and behaviors, hearing their voices as clearly as possible, engaging with them in their contexts, as well as the lengthy observation period (seven months), provided me with insights into the ways they made meanings and constructed cultural knowledge systems from their out-of-school video gaming practices.

The findings from my study suggest the boys' preferences for video games are either puzzle platformer, narrative, or interactive adventure based. My observations also indicate how the boys used their video gaming practices for meaning-making and their collaborative efforts for gaining knowledge processes during their video gaming practices. Although my observations did not focus on in-school gaming practices, a future study is planned for understanding if out-of-school video gaming practices and multiliteracies meaning-making can be transitioned for in-school literacy practices. Therefore, future studies should focus on a multiliteracies pedagogical framework (Cope & Kalantzis, 2009; The New London Group, 1996) as a lens to determine how 21st century learners, particularly those with technical outside interests in video games, could potentially bridge those multiliteracies practices in school. Finally, it is worth noting video gaming practices are important places for learners to make meanings. At the same time, concerns continue to be raised by scholars regarding boys' engagement in video gaming practices that may involve negative identity construction or violent content. Findings emerging from my study provide researchers with insights that not all boys choose these types of games nor do they respond to this type of video content with

negative behaviors. These video game choices and expressions of masculinity, which emerged from my research data, may involve a future study. If a multiliteracies framework is to be representative of learners in the 21st century, then video gaming should be considered one of the focal points in the multiliteracies model, as evidenced by recent advancement of this research (Apperley, 2010; Apperley & Beavis, 2013; Gee, 2007; Squire, 2013; Steinkuehler, 2010; The New London Group, 2000).

6.1 Limitations

I did encounter some limitations in the fieldwork that may have influenced the ways the boys (Albert, Jeffrey, Mike, and Brian) explored their video gaming practices. These limitations include the choices of games available for Albert and Jeffrey at the community centre site computers. On these computers, a library database of pre-set games were selected by staff, based on preferences by adult members, aged 18 and up. These choices of games dictated what the boys chose to play. Therefore, during the time I spent with them at the community centre, Albert and Jeffrey were limited in opportunities to use narrative-based video games for me to observe how they demonstrated their critical literacy skills. Jeffrey compensated for this deficiency through his nature of verbalizing his at-home video game experiences. In contrast, Albert was quiet and introverted, so it was difficult to gain deeper insights into his experiences.

Additionally, I could not fully observe all of the boys (Albert, Jeffrey, Mike, and Brian) at all times outside of the fieldwork times and sites. I was unable to observe within their homes or interactions with family members, which may limit the depth of some of the cultural themes. To compensate for this limitation, the boys openly shared their personal gaming experiences at home, and outside of both the community centre and the after-school video club. Another limitation was Albert's perspective about hegemonic traits that he describes as doing something drastic, such as being loud at school. He did not elaborate as to whether this was a personal experience or his own nature viewing these traits as avoidable.

6.2 Future directions planned

Based on the above limitations, one future direction would be to include at-home activities as an additional out-of-school context. The limited availability of various video games on the library database was a consistent source of complaint for both Albert and Jeffrey. Expanding the study to the boys' home or personal surroundings may provide opportunities for the boys to play their own choice of games, which may provide different results and perspectives.

I observed the boys' behavioral traits within the multiple sites, which resembled semi-regulated environments. A future study could include observations inside and outside of the school, including the home. These extended observations may reveal their interactions with family or friends and confirm consistency of their behavioral traits present in the current findings. Albert's comment about demonstrating certain behaviors in school to mitigate risk of discipline would be easier to confirm with observations from interactions with friends and families at home or even within the school environment.

Additionally, Mike and Brian provided many insights about their experiences at university video gaming tournaments. They explained ways that they made meanings and built cultural knowledge by collaborating with peers, building relationships, and learning strategies during these tournament visits. To understand their unique experiences better, a future study could include attending these tournaments with them to observe how they interact with peers and make meanings in such contexts.

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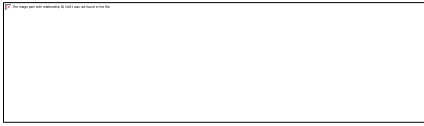
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Appendices

Appendix A: Parent Letter of Information and Consent



*What's Your Score? How Boys' Video Gaming
Intersects Masculinities and Literacy practices in
School.*

Letter of information to parent or guardian

Introduction: My name is Carol-Ann Lane and I am a PhD student at the Faculty of Education at Western University. Your son is invited to participate in a research study.

Purpose of the study: The purpose of this study is to examine the relationship between boys' involvement with video gaming and literacy.

If you agree to your son's participation: If you allow your son to participate, you agree that I may conduct a short survey with your son to see if he qualifies for this research. If he qualifies, you agree community centre staff to be present when the research is being conducted. You also agree that I may: be present at the community centre when the research is being conducted for a maximum of 15 hours over a three-week period at times convenient to you, your son, the researcher and community centre staff to observe your son engaging in video gaming in a common space as he plays alone, with peers or with other online gamers; conduct an interview with your son for not more than one hour following the three-week observation period.

Confidentiality: The information collected will be used for research purposes only; personal details such as your son's name or age which could identify him will not be used in any publication or presentation of the study results. All information collected will be encrypted on a password protected computer and your son will be assigned a number to ensure anonymity of his information. Observational notes, audio, video recordings and surveys will be kept under lock and key in the researcher's office in a secure area for five (5) years after which they will be destroyed by secure shredding, reformatting or physical destruction.

Risks: There are no known risks to your son by participating in this study.

Voluntary Participation: Participation in this study is voluntary. You do not have to agree for your son to participate and may withdraw consent for your son to participate at any time in the future for any reason without explanation. If

you do not consent now or withdraw him at a later time, your decision will be kept confidential to ensure that there is no social effect on him. If you wish to withdraw your son before the data are analyzed, his data will be destroyed and not included in the study results but that if you withdraw him after the data have been analyzed, his data cannot be removed and will remain with the researcher.

Questions

If you have any questions about the conduct of this study or your son's rights as a research participant you may contact the Office of Research Ethics, Western University at 519-661-3036 or ethics@uwo.ca. If you have any questions about this study, please contact the researcher, Carol-Ann Lane at the Graduate office or my doctoral supervisors, Dr. John Barnett and Dr. Michael Kehler.

This letter is yours to keep for future reference.

[Signature]

What's Your Score? How Boys' Video Gaming Intersects Masculinities and Literacy practices in School

Researcher: Carol-Ann Lane

Consent form

I have read the letter of information, have had the nature of the study explained to me and I agree that my child may participate in the study. All questions have been answered to my satisfaction.

Name of Student

Printed Name of Parent/Guardian

Parent/Guardian's Signature

Date

Appendix B: Student Letter of Information and Assent



*What's Your Score? How Boys' Video Gaming
Intersects Masculinities and Literacy practices in
School.*

Letter of information to student

Introduction: My name is Carol-Ann Lane and I am a PhD student at the Faculty of Education at Western University. You are invited to participate in a research study.

Purpose of the study: The purpose of this study is to examine the relationship between boys' involvement with video gaming and literacy.

If you agree to participate in this study: I will conduct a short survey with you to see if you qualify for this research. If you qualify, you agree that I may: be present at the community centre when the research is being conducted for a maximum of 15 hours over a three-week period at times convenient to you; observe you engaging in video gaming in a common space as you play alone, with peers or with other online gamers; conduct an interview with you about your experiences for not more than one hour following the three-week period. During the study, I will use video, audio and written observation notes to record you playing video games. At times, I may stop the video/audio recording to ask why you played the game in a certain way or created a certain online character. I may also ask during the session why a certain type of video game was chosen and if you would play the same type of game with other male friends. I will ask you to check the video/audio recordings and notes to verify if I interpreted your responses and actions correctly and allow you to change your responses if you wish. Following each weekly session I will conduct an overall review with you on what I've observed from video/audio and observation notes. For participating in this study, you will be provided with a \$10 gift card from a retail store at the end of the study.

Confidentiality: The information collected will be used for research purposes only; personal details such as your name or age which could identify you will not be used in any publication or presentation of the study results. All information collected will be encrypted on a password protected computer and you will be assigned a number to ensure anonymity of your information. Observational notes, audio, video recordings and surveys will be kept under lock and key in the researcher's office in a secure area for five (5) years after

which they will be destroyed by secure shredding, reformatting or physical destruction.

Risks: There are no known risks for you to participate in this study.

Voluntary Participation: Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from the study at any time in the future for any reason without explanation. If you withdraw at a later time, your decision will be kept confidential to ensure that there is no social effect on you. If you withdraw before the data are analyzed, your data will be destroyed and not included in the study results but that if you withdraw after the data have been analyzed, your data cannot be removed and will remain with the researcher.

Questions

If you have any questions about the conduct of this study or your rights as a research participant you may contact the Office of Research Ethics, Western University at 519-661-3036 or ethics@uwo.ca. If you have any questions about this study, please contact the researcher, Carol-Ann Lane at the Graduate office or my doctoral supervisors, Dr. John Barnett and Dr. Michael Kehler.

This letter is yours to keep for future reference.

[Signature]

What's Your Score? How Boys' Video Gaming Intersects Masculinities and Literacy practices in School

Researcher: Carol-Ann Lane

Assent form

I have read the letter of information, have had the nature of the study explained to me and I agree that I will participate in the study. All questions have been answered to my satisfaction.

Name of Student

Student's Signature

Date

Appendix C: Parent Letter of Information and Consent (School board)



*What's Your Score? How Boys' Video Gaming
Intersects Masculinities and Literacy practices in
School.*

Letter of information to parent or guardian

Introduction: My name is Carol-Ann Lane and I am a PhD student at the Faculty of Education at Western University. Your son is invited to participate in a research study.

Purpose of the study: The purpose of this study is to examine the relationship between boys' involvement with video gaming and literacy.

If you agree to your son's participation: If you allow your son to participate, you agree that I may conduct a short survey with your son to see if he qualifies for this research. If he qualifies, you agree after school program teacher to be present when the research is being conducted. You also agree that I may: be present at the school's after school club when the research is being conducted for a maximum of 15 hours over a three-week period at times convenient to you, your son, the researcher and the school to observe your son engaging in video gaming in a common space as he plays alone, with peers or with other online gamers; conduct an interview with your son for not more than one hour following the three-week observation period.

Confidentiality: The information collected will be used for research purposes only; personal details such as your son's name or age which could identify him will not be used in any publication or presentation of the study results. All information collected will be encrypted on a password protected computer and your son will be assigned a number to ensure anonymity of his information. Observational notes, audio, video recordings and surveys will be kept under lock and key in the researcher's office in a secure area for five (5) years after which they will be destroyed by secure shredding, reformatting or physical destruction.

Risks: There are no known risks to your son by participating in this study.

Voluntary Participation: Participation in this study is voluntary. You do not have to agree for your son to participate and may withdraw consent for your son to participate at any time in the future for any reason without explanation. If you do not consent now or withdraw him at a later time, your decision will be kept confidential to ensure that there is no social effect on him. If you wish to

withdraw your son before the data are analyzed, his data will be destroyed and not included in the study results but that if you withdraw him after the data have been analyzed, his data cannot be removed and will remain with the researcher.

Questions

If you have any questions about the conduct of this study or your son's rights as a research participant you may contact the Office of Research Ethics, Western University at 519-661-3036 or ethics@uwo.ca. If you have any questions about this study, please contact the researcher, Carol-Ann Lane at the Graduate office or my doctoral supervisors, Dr. John Barnett and Dr. Michael Kehler.

This letter is yours to keep for future reference.

[Signature]

What's Your Score? How Boys' Video Gaming Intersects Masculinities and Literacy practices in School

Researcher: Carol-Ann Lane

Consent form

I have read the letter of information, have had the nature of the study explained to me and I agree that my child may participate in the study. All questions have been answered to my satisfaction.

Name of Student

Printed Name of Parent/Guardian

Parent/Guardian's Signature

Date

Appendix D: Student Letter of Information and Assent (School board)



*What's Your Score? How Boys' Video Gaming
Intersects Masculinities and Literacy practices in
School.*

Letter of information to student

Introduction: My name is Carol-Ann Lane and I am a PhD student at the Faculty of Education at Western University. You are invited to participate in a research study.

Purpose of the study: The purpose of this study is to examine the relationship between boys' involvement with video gaming and literacy.

If you agree to participate in this study: I will conduct a short survey with you to see if you qualify for this research. If you qualify, you agree that I may: be present at the after school club when the research is being conducted for a maximum of 15 hours over a three-week period at times convenient to you; observe you engaging in video gaming in a common space as you play alone, with peers or with other online gamers; conduct an interview with you about your experiences for not more than one hour following the three-week period. During the study, I will use video, audio and written observation notes to record you playing video games. At times, I may stop the video/audio recording to ask why you played the game in a certain way or created a certain online character. I may also ask during the session why a certain type of video game was chosen and if you would play the same type of game with other male friends. I will ask you to check the video/audio recordings and notes to verify if I interpreted your responses and actions correctly and allow you to change your responses if you wish. Following each weekly session I will conduct an overall review with you on what I've observed from video/audio and observation notes. For participating in this study, you will be provided with a \$10 gift card from a retail store at the end of the study.

Confidentiality: The information collected will be used for research purposes only; personal details such as your name or age which could identify you will not be used in any publication or presentation of the study results. All information collected will be encrypted on a password protected computer and you will be assigned a number to ensure anonymity of your information. Observational notes, audio, video recordings and surveys will be kept under lock and key in the researcher's office in a secure area for five (5) years after which they will be destroyed by secure shredding, reformatting or physical destruction.

Risks: There are no known risks for you to participate in this study.

Voluntary Participation: Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from the study at any time in the future for any reason without explanation. If you withdraw at a later time, your decision will be kept confidential to ensure that there is no social effect on you. If you withdraw before the data are analyzed, your data will be destroyed and not included in the study results but that if you withdraw after the data have been analyzed, your data cannot be removed and will remain with the researcher.

Questions

If you have any questions about the conduct of this study or your rights as a research participant you may contact the Office of Research Ethics, Western University at 519-661-3036 or ethics@uwo.ca. If you have any questions about this study, please contact the researcher, Carol-Ann Lane at the Graduate office or my doctoral supervisors, Dr. John Barnett and Dr. Michael Kehler.

This letter is yours to keep for future reference.

[Signature]

What's Your Score? How Boys' Video Gaming Intersects Masculinities and Literacy practices in School

Researcher: Carol-Ann Lane

Assent form

I have read the letter of information, have had the nature of the study explained to me and I agree that I will participate in the study. All questions have been answered to my satisfaction.

Name of Student

Student's Signature

Date

Appendix E: Participant Survey



*What's Your Score? How Boys' Video Gaming
Intersects Masculinities and Literacy practices in
School.*

Participant survey

Name: _____

Gender: _____ Age: _____

Grade Enrolled: _____

Address: _____

Email: _____

Telephone: _____

Survey Questions:

From the list provided, please identify with an “X” the types of video games you play (add any video games not shown in the list below in the blank lines provided)

Video Game	Play alone	Play with friends	Play online
Hunger Games			
Grand Theft Auto			
Wolfe Among Us			
Dear Esther			
Uncharted 2			
Rise of Nations			
Add any video games below not shown above			

- 1) How many hours a week do you typically spend playing a video game?

- 2) Do you play video games alone that differ from what you would play with your friends? Why?

- 3) Do you like to share ideas about the game with online players or your friends?

- 4) Do you have interest in writing or expressing ideas about the game’s narrative qualities (plot, characters, conflict or action)?

Appendix F: Sample Interview questions to participants



*What's Your Score? How Boys' Video Gaming
Intersects Masculinities and Literacy practices in
School.*

Version Date: 07/06/2014 Participant Interview (Post Observation)

Name:

Gender:

Age:

Grade Enrolled:

Address:

Email:

Telephone:

Interview Questions:

- 1) Do you routinely play video games by yourself, with online gamers or with peers? Which do you prefer? Why?

- 2) What video games do you play alone that your friends don't know you play? Why?

- 3) In what ways do you read, learn or write about activities when you've played your video games? Why?

- 4) When you play video games online with other gamers do you ever collaborate with them about the video games (strategy, plot, characters, etc.)? Why?

- 5) Are there ways that you act as a boy at school (do you perform certain masculine traits) that you don't act at home or while playing video games? Why?

- 6) How would you have acted if you had been here with a friend who likes violent video games or games that dominate or victimize women? Why?

- 7) Would you play this type of game with a friend or another type of game? Why?

- 8) What would you be afraid they might think? Why?

- 9) How do you express your masculinity when you play, create or choose virtual characters in video games? Why?

10) Based on your response in question 8, do you feel less inhibited, pressured or afraid with how you act when you are at school or with peers? Why?

11) What did I not ask you that I should have asked you?

**Appendix G: Western University Non-Medical Research Ethics Board
NMREB Amendment approval**



**Western University Non-Medical Research Ethics Board
NMREB Amendment Approval Notice**

Principal Investigator: Dr. John Barnett
Department & Institution: Education/Faculty of Education, Western University

NMREB File Number: 105-83
Study Title: What's Your Score? How Boys' Video Gaming Interacts Masculinities and Literacy practices in School
Sponsor:

NMREB Revision Approval Date: June 05, 2015
NMREB Expiry Date: July 31, 2016

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Revised Assent	Letter Information Student Assent form. This draft shows the tracked changes at the Thames Valley District School Board (TVDSB) request	2015/05/08
Revised Letter of Information & Consent	Letter Information Parent Consent form. This draft shows the tracked changes at the Thames Valley District School Board (TVDSB) request	2015/05/08

The Western University Non-Medical Science Research Ethics Board (NMREB) has reviewed and approved the amendment to the above named study, as of the NMREB Amendment Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB-00000000


 _____, on behalf of Riley Hanson, NMREB Chair

Ethics Officer to Contact for Further Information

<input type="checkbox"/> Erika Basile ebasile@uwo.ca	<input checked="" type="checkbox"/> Grace Kelly grace.kelly@uwo.ca	<input type="checkbox"/> Kaiti Stedman k.stedman@uwo.ca	<input type="checkbox"/> Vikki Chan vchan@uwo.ca
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This is an official document. Please retain the original in your files.

Curriculum Vitae

Name: Carol-Ann Lane

Post-secondary Education and Degrees: **Ph.D. Education**
Western University, 2018

Ontario Teacher's Certificate
Intermediate/Senior, English, Business, 2012
Junior Division, 2014
Primary to Grade 3 Division, 2018

Bachelor of Education
Western University, 2012
• Honours With Distinction

Masters of Education
Athabasca University, 2011
• Honours

Bachelor of Arts
University of Toronto, 1989
• Honours Double Major: English and Urban Geography

Honours and Awards: **Graduate Research Grant**
University of Western Ontario, 2016-2017

Graduate Research Scholarship
University of Western Ontario, 2012-2016

Related Work Experience **Teacher Associate/Guest Lecturer**
Western University, 2013-2016

Research Associate
The University of Western Ontario, 2012-2013

Grade six Teacher
Dufferin Peel Catholic District School Board, 2017-current
Intermediate/Senior English Teacher
Dufferin Peel Catholic District School Board, 2012-2017

Publications (Refereed):**Chapters in Edited books:**

- Lane, C.A. (forthcoming). Collaborating with educators: How video games can be used for alternative classroom pedagogies to support boys meaning-making. In R. M. Reardon, and J. Leonard (Eds.), *Integrating Digital Technology in Education: School-University-Community Collaboration*. Charlotte, NC: IAP. (AERA research listing)

Articles:

- Lane, C.A. (2016). "Play, Score, Engage": Finding Ways for Boys to Make the Grade!" Literacy Information and Computer Educational Journal (LICEJ), Volume 7, Issue 4, ISSN 2461-2467
- Lane, C.A. (2013). *Using video technology to address boys' literacy gap and connect the male voice in gender dynamics*. International Journal of Technology and Inclusive Education (IJTIE), Volume 2, Issue 2, ISSN 2046-4568

Conference Proceedings:

- Lane, C.A. "Play, Score, Engage": Finding Ways for Boys to Make the Grade!", Canada International Conference on Education (CICE-2016), University of Toronto, Mississauga, Ontario, June 27-30, 2016
- Lane, C.A. "How video games affect boys' literacy practices", The Robert MacMillan Graduate Research in Education Symposium-Theory to Practice. Western University, London, Ontario, March 18, 2014
- Lane, C.A. "Connecting with the male voice to address boys' literacy gap", The Robert MacMillan Graduate Research in Education Symposium. Western University, London, Ontario, April 18, 2013
- Lane, C.A., "Connecting to the Male Voice to Address Boys' Literacy", Proceedings of the Canada International Conference on Education, University of Toronto, Toronto, Ontario, June 24-26, 2013. (Total 311 papers accepted from received 2,904 papers from 152 countries)
- Lane, C.A., "Investigate the Use of Mobile Technology to Influence Gender Equity in Literacy", Proceedings of the Inaugural European Conference on Education 2013 (IAFOR ECE), Learning and Teaching Through Transformative Spaces. Brighton, UK, July 11-14, 2013. Link (p.14): http://iafor.org/ece_proceedings.html
- Lane, C.A., Barnett, J., "Biotechnology literacy: Assessing the knowledge and attitudes of student teachers", The Western Conference on Science Education (WCSE). July 9-11, 2013.