Exploring iPad Video Composition: A Study of Elementary School Students’ Collaborative Digital Literacies Practices

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Abstract

This qualitative research study engages with sociocultural theory, multimodality and Actor-Network Theory to examine the complexities of iPad video composition with elementary school children. While school videomaking has been investigated in studies focused on the finished product, the processes of videomaking and video editing (composition) on these devices have remained largely unexplored.

This study seeks to answer: “How does a group of students engage with the iPad in creating a video?” By investigating how mobile devices dislodge the concept of “literacy” from its time-honored “reading” and “writing” connotations and move towards multimodal representations, the author engages with Actor-Network Theory’s “Obligatory Passage Point” (Callon, 1986) and with Fulwiler and Middleton’s (2012) notions of Compositing and Recursivity. The study details the struggles and successes of collaborative work in a group of Grade 4 students and shows how one student emerges as the lynchpin between the adults’ linear, paper-based video composition strategies and the children’s non-linear, digitally-based video composition proclivities.

By focusing on how propositional and performance epistemologies (Lankshear & Knobel, 2007) come into play in a classroom previously dominated by paper-based literacy practices, the author hopes to provide practitioners and researchers alike a glimpse into how digital literacies instruction might be taken up in classrooms.

Keywords: multimodality; digital literacies; iPad; Actor-Network Theory; video composition; literacy
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Chapter 1.

Introduction

We live in exciting times for digital technology: the rise in the number and diversity of mobile technologies¹ as predicted by Moore’s 1965 law², which stated that faster, smaller and lighter processors/transistors would be produced every 18 months, explains the speed with which our digitally-laden landscape is continually changing³. New apps, new generations of tablets and phones are released every couple of months, stemming from consumers’ seemingly insatiable desire for faster, lighter and more sophisticated devices. Growing up in an environment saturated with digital imagery, Internet and access to mobile technology, young people are responsive to the changes in the digital landscape (Hull & Schultz, 2001; Lankshear & Knobel, 2003; Buckingham, 2003; Hull & Nelson, 2005; Poyntz & Hoechsmann, 2012; Merchant, 2013; Rowsell & Wohlwend, 2016). It comes as no surprise that the increasing popularity of meme-ing, blogging, culture jamming, sampling, mash-ups and remixing are, according to Lankshear and Knobel (2003, 2007), examples of how “new literacies” permeate people’s daily practices, and enact powerful challenges to traditional print-centric forms of literacy (Miller & McVee, 2012). Schools are not impervious to these changes, but as Marshall and Toohey (2010) aptly observed, while children live in and have access to “a complex blend of old and new media” (p. 223), schools’ efforts to recognize “that purposeful learning can occur through a whole range of modes: images, speech, sound, writing, performance, action, movement, space and a range of materials and media” (Stein, cited in Marshall & Toohey, 2010, p. 224) are still quite timid. As digital devices are becoming more diverse (Jewitt, 2008) and more popular, schools struggle to integrate them in their curriculum.

¹ The iPhone was introduced in 2007, while the iPad was launched in 2010.
² Moore’s Law refers to an observation made by computing scientist Gordon Moore in 1965. He predicted that the new field of computer science would see an incredible development thanks to scientists' ability to create smaller and smaller processors. 50 years later, his law is still upheld (Patterson, 2011).
³ Research labs are constantly looking for cutting edge technologies: textile electronics, e-ink and even ‘sketching electronics’ (using a specialized kit to design and use your own electronic system) are no longer envisioned as far-fetched technologies. (This video from MIT’s media lab makes some of these advances clear: http://www.youtube.com/watch?v=GarBZhZnFQs).
Responding to the influx of mobile devices that permeate society, school districts in Canada and the United States have been investing in digital technology (Blackwell, Lauricella, and Wartella, 2014). But simply providing digital tools may not suffice: as Blackwell et al. (2014) put it: “despite the excitement around technology, some school leaders and policymakers may fail to recognize that technology in and of itself, may not have the inherent power to change teaching and learning practices” (p.83). A harsh lesson in hasty investment in a ‘trendy’ device was reported in Los Angeles. In 2014, the Los Angeles Unified School District (LAUSD)—the second largest school district in the US—started an iPad acquisition program, with no previous preparation, but with a massive, 1.3 billion dollars financial backup (Horn & Staker, 2014). The program failed: Pearson, the publishing company that partnered with Apple, provided poorly designed and ‘buggy’ apps that constantly crashed the iPads. When the LAUSD blocked access to the Internet, the students exploited the iPad’s security vulnerabilities, bypassed the firewall and the school district terminated the program. Discussing the case, Horn and Staker (2014) noted that the LAUSD failed on multiple levels: it did not consult with literacy experts, and it did not provide adequate teacher training. In a nutshell, they concluded that: “districts are starting with the technology and not asking themselves: ‘What problem are we trying to solve, and what’s the instructional model we need to solve it?’” (p. 23).

As literacy researchers, we need to take heed of Horn and Staker’s (2014) advice. Without pilot programs and qualitative studies that may expose vulnerabilities in implementing digitally-mediated projects, other school districts could face problems. Time is of the essence. Across the US and Canada, the US DOE⁴ and the Canadian Ministries of Education⁵ have released plans and directives aimed at speeding up the introduction of digital technologies in classrooms. The stakes are also high: in the US, in the 2016-17 school year, 51 million students attended public elementary and secondary schools. Yet, despite these figures, no official data, either in Canada and the US, have been released regarding the actual number of digital devices and the age-group of students who may be using them. However, educational researchers have access to

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⁴ In 2010, the US Department of Education released a National Education and Technology Plan aimed at promoting student-centered learning using technology.

⁵ In 2013, the British Columbia Ministry of Education issued directives encouraging schools to promote collaborative practices and problem solving using digital technologies (Smythe, Toohey, and Dagenais, 2014).
numerical data on digital technology coming from by private research companies\textsuperscript{6}. According to these companies, in the US in 2016 alone, over 13 million mobile devices were distributed to elementary and secondary schools. Based on the information provided by Canadian private media consulting companies \textsuperscript{7}, over 25\% of Canadian Grade 4 students own a cell phone and use mobile devices on a regular basis. Given the lack of official information on social trends in digital media use, literacy researchers might want to revisit Jenkins, Purushtoma, Weigel, Clinton and Robinson’s (2006) study, \textit{Confronting the Challenges of Participatory Culture: Media Education for the 21st Century}. In it, Jenkins et al. expressed concern over the rapidity with which digital technologies made their way into schools without attendant changes in the curriculum. Moreover, they called for more research on in-classroom appropriation and “rearticulation” in “powerful new ways” (p.8) of the digital content students encounter outside school. In this respect, I found Rowsell, Morrell and Alvermann’s (2017) proposal to increase research on out-of-school literacies extremely wise. Since “it is certainly not the case that all young people are necessarily tech-savvy or that they are tech-savvy in the same ways and to the same degree” (p.161), the out-of-school studies on the uptake and uneven distribution of digital resources (Roswell et al., 2017) could help researchers develop more “robust and nuanced language” (p.160) for digital literacy research. Moreover, the growing number of in-school studies (Rojah-Drummond, Albarran & Littleton; 2008; Rowsell & Harwood, 2015; Smith 2016) that focus on digital technologies suggest that mobile devices have the potential to dislodge the concept of “literacy” from its time-honored “reading” and “writing” connotations and to move it towards more dynamic and multimodal representations. As Margen and Van der Weel (2016) observed, Kindle readers and iPads have distinctly different affordances [than] paper. Given that textual reading is likely to remain important as a cultural practice, and is undergoing massive change as digital screens are supplementing paper—with the potential to replace it as the dominant substrate—there is an urgent need to investigate what effects such change might have on the reading of different kinds of texts, for different purposes (p. 116).

\textsuperscript{6} “Project Tomorrow” (\url{www.tomorrow.org}) and “Futuresource Consulting” (\url{www.futuresource-consulting.com})

\textsuperscript{7} “Media Smarts” (\url{www.mediasmarts.ca})
Indeed, literacy researchers (Poyntz & Hoechsmann, 2012; Merchant, 2013; Walsh & Simpson, 2014) have so far concluded that as the number and variety of technologies are becoming more prevalent in people's daily literacy practices, digital technologies have brought changes in the way students engage with literacy. Literacy practices, Lapp, Moss and Rowsell, (2012) argue, no longer focus on literacy just as a social and cultural phenomenon, but are moving rapidly towards “encompassing eclectic texts, found or handmade artifacts, small mobile devices and tablets” (p. 367). Literacy practices happening in the digital realm have produced a ripple effect in terms of what it means to be literate, and how one would define “text”. As Kress noted,

It is no longer possible to think about literacy in isolation from a vast array of social, technological and economic factors. Two distinct, yet related factors deserve to be particularly highlighted. These are, on one hand, the broad move from now centuries long dominance of writing to the new dominance of the image and, on the other hand, the move from the dominance of the medium of the book to the dominance of the medium of the screen. These two together are producing a revolution in the uses and effects of literacy and of associated means for representing and communicating at every level and in every domain (Kress, 2003, p.1, cited in Jewitt, 2008, p. 241).

Moreover, as digital technology has become more prevalent in students' lives and made its way into classroom instruction, it has piqued literacy researchers’ interest in the ways in which students and teachers engage with multimodal, multi-platforms devices (Hutchinson, Beschorner, and Schmidt-Crawford, 2012; Beschorner & Hutchison, 2013; Walsh & Simpson, 2014). While sociocultural theorists (Vygotsky, 1978; Rogoff, 2003; Wertsch, 2007; Lantolf, 2006) placed human collaboration at the center of knowledge creation, with the advent of digital technology, researchers (Walsh & Simpson, 2014; Burnett, Merchant, Pahl and Rowsell, 2014) noted that knowledge production is becoming increasingly materially-mediated. The same shift, in the wake of the influx of mobile technology towards the socio-material has been observed, in classroom practices, by Misfud (2014) who argued that,

[A] book, a copybook and a pencil—these are all mobile technologies that are established as materials in the classroom and that have established practices. But while the book, the pencil and the copybook are established practices in the classroom, the mobile technology is not [...]. If we accept that society has a mobile conception, including the access to social networking and knowledge embedded in different practices, we also need to reconsider classroom practices and their socio-materiality. (p.46)
1.1. Objectives

In recent years, Miller (2013) and Mifsud (2014) have highlighted the need to research digital versus paper-based literacy, and have recognized, like others (Walsh and Simpson, 2014) that “the changes in the technological landscape have altered classrooms” (p.129). Therefore, conducting studies on this topic could help both practitioners and researchers find efficient ways of engaging with digital technology. In this respect, this thesis investigates the ways in which already established in-classroom, paper-based literacy practices respond to the introduction of the new, less prone to pinning-down-to-one mode (writing or reading) digital literacies. Probably one of the most exciting (and less studied) ways of understanding the impact of digital technologies in classrooms is research involving children making videos (Goodman, 2003; Miller, 2007; Bruce, 2009; McKenney & Vogt, 2011). However, while these studies focused on the end-product (the finished video), as Toohey, Dagenais and Schulze (2012) pointed out, researching the process of video making sheds light on how digital literacies can provide an understanding of the affordances of material devices and on the nature of teacher and student interactions, interactions which may not be so obvious during regular classroom literacy instruction.

This thesis focuses on the last three days of a video-making project which lasted three months and involved a group of three grade 4 students who used an iPad, GarageBand and iMovie\(^8\) to shoot and edit a video on nature conservation. I chose to examine this process because video editing provided a rich medium for analysing the tensions between a paper-based, step-by-step method of movie editing versus a more fluid, and recursive way that relied mostly on the iPad. The tensions that arose from these two perspectives revealed collaborative and individual engagement with both paper and digital-based literacy. By bringing to the fore the constant interaction between paper-based and digital literacies, I hope to document the complex negotiations, obstacles, failures and triumphs that accompanied the students and the teachers in their iPad-mediated collaborative effort.

In order to analyze collaborative processes that stemmed from the affordances of a new material medium (the iPad), I used Actor-Network Theory (ANT), sociocultural

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\(^8\) GarageBand and iMovie are both developed and sold by Apple. Inc.
theory (SCT), multimodality, and information I gathered from composition studies. I believe that insights from these perspectives will help researchers and practitioners alike identify more effective ways of integrating iPads in literacy education.

Using ethnographic methods in the tradition of qualitative research modeled after Actor-Network Theory’s “follow the actors” (Law, 2006) tenet for data analysis, I will argue that the students’ collaborative practices revealed a multi-faceted process of co-constructing and exchanging knowledge, in which the iPad played a pivotal role in bringing together and shaping students’ diverse digital and paper-based literacy competencies. I conclude the thesis with a discussion of the implications for literacy practices, teacher education and classroom curriculum and I focus on the successes and shortcomings of the project and well as on the students’ recommendations for improving their experience with iPads.

1.2. Research Questions

Focusing on iPad video editing sets this thesis in the middle of an animated conversation, at a time when the literacy research community is becoming increasingly interested in the intricacies of analyzing student and teacher’s interactions in digitally-laden milieus (Walsh & Simpson, 2014; Rowsell & Wohlwend, 2016). By focusing on collaborative practices in iPad video editing, I argue that, rather than viewing the individual as the main creator and beneficiary of knowledge, research needs to recognize networked confluences of people and objects (iPads) that imbue literacy practices with fluidity, heterogeneity and non-linearity. As a result, the individual is no longer the most important link in the epistemological chain (Castells, 2001), but one of the many (human and non-human) actors involved in literacy practices. In this respect, this thesis sets out to answer this research question:

- How does a group of students engage with the iPad in creating a multimodal digital product?

To approach this question, the following sub-questions guide the study:

- What are the strategies students used in the editing process?
- What semiotic resources did they draw on during the editing process?
• How do students’ strategies in editing compare to the instructions they received from teachers?

1.3. Overview of the chapters to follow

To answer these questions, Chapter 2 provides an overview of the theoretical lenses that have guided both paper and digital literacy research. It shows how sociocultural researchers along with New Literacy Study researchers have worked tirelessly to point out the weaknesses of an “autonomous” model of literacy and to promote a better understanding of the “ideological” model (Street, 1984). As literacy studies were responding to the digitalization of communicative practices, multimodality opened new possibilities to talk about “new mindsets” (Lankshear & Bigum, 1999), and new ways of defining “text” as a complex, multimodal entity. In this respect, I provide a comprehensive overview of multimodality, and provide compelling reasons for studying the students’ engagement with the iPad from a multimodal perspective. Like Hafner (2012), I will argue that iPad video making practices can be analyzed as digital composition and that iPad movie making is, probably, one of the most intriguing and comprehensible ways of analyzing digital literacy practices. I build my case for focusing solely on video editing instead of video making on a digital platform. In this respect, I introduce the reader to the concepts of “Compositing” and “Recursivity” as defined by Fulwiler and Middleton (2012) and I show how Actor-Network Theory’s “Obligatory Passage Point” could help unpack the students’ engagement with digital video editing in a classroom previously dominated by paper-based literacy practices.

Chapter 3 discusses the qualitative methodologies I employed in this project, as well as the difficulties of working with diverse, multimodal data. It explains, in detail, my choice of engaging in a case-study, and how the data were collected and analyzed.

Chapters 4-6 focus, in detail, on each of the three days of video editing and show how each day presented the video editing participants with different challenges. As each day addresses a different aspect of the video editing process, the reader will observe a lot more differences than similarities in collaborative practices as the video editing process unfolds. Overall, these three chapters invite the reader to follow the actors, both human and non-human (the students, the teachers, the instructors and the iPad) on a complex journey mediated by paper and digital literacy.
Chapter 4 focuses on the students' collaborative efforts on working with both paper-based (script and storyboard) and digital-based (text on iPad) literacy. It details the students' confusion as to why and how to create a storyboard, and the teachers' insistence on using the paper-based literacy object as the foundation for editing the video.

Chapter 5 outlines a new set of challenges that require a reconsideration of collaborative roles among the students. No longer facing the dreaded “storyboard” production, the students struggle to work on a single iPad and start putting together numerous versions of the movie. Chapter 5 provides a detailed analysis of how two students engaged with different styles of movie editing: one student preferred to work exclusively on the iPad, while another used the storyboard as the scaffold for building up the movie timeline.

Chapter 6 focuses on the last and the most challenging day of movie making: the students rushing to add voiceover recordings and ordering them so that they could “fit” the images and the videos on the timeline. As the last day sees an uptake in multimodal engagement with the iPad, it provides a rich perspective of how the students engaged in digital literacy practices that were, most likely, acquired outside of their classroom.

Finally, Chapter 7 provides a reflective lens on the entire research process, the lessons and conclusions I drew from working on this project, a description of some of the shortcomings (theoretical and practical) that transpired through this study, as well as implications for further research.
Chapter 2.

Theoretical Frameworks

2.1. Literacy as a sociocultural practice

Traditionally, literacy has been defined as the ability to read and write using the grammatical, pragmatic and rhetorical conventions of a standard language (Gee, 1990). When defined this way, literacy is perceived as a fixed, measurable ability (“the autonomous model” Street, 1984), and is reduced to a measurable set of skills that exist independently from social contexts. Supporters of the autonomous model (Goody & Watt, 1963; Ong, 1986) claimed that reading and writing can produce significant changes in an individual’s and a society’s conditions: the higher the number of literate individuals, the better the social outcomes for the entire society (Street, 1999). To this day, the autonomous model is extremely influential and continues to be assumed when assessing individuals’ and even a country’s levels of literacy. Even in the US, a country with a huge number of accomplished literacy researchers, the Bureau of Census continues to ignore new developments in literacy research and, instead as Smit (2004) noted, “considers people literate if they can read and write a simple message at the fifth-grade level, although, once again, a simple message does not seem to be what we usually refer to as writing, and just what ‘the fifth-grade level’ means is ambiguous” (p. 114).

As a direct response to the idea that literacy refers solely to the ability to read and write, researchers influenced by sociocultural theory (SCT) have produced ethnographic studies aimed at challenging this rigid view. Scholars who adopt the SCT perspective (Wertsch, 1991,1998; Rogoff,1994; Lantolf & Thorne, 2006) suggested that a better way of understanding what it means to be literate can be drawn from observing how people from different walks of life and cultures engaged in literacy practices. Drawing on the work of Lev S. Vygotsky (1986), Wertsch, Rogoff, and Lantolf and Thorne, argued that social interaction and participation in culturally-formed settings such as family and schooling are the crux of individual development:

Humans are understood to utilize existing cultural artifacts and to create new ones that allow them to regulate their biological and behavioral activity.
Language use, organization, and structure are the primary means of mediation. Practically speaking, developmental processes take place through participation in cultural, linguistic, and historically formed settings such as family life and peer group interaction, and in institutional contexts, like schooling, organized sport activities, and work places, to name a few. (Lantolf & Thorne, 2006, p. 197)

Perceiving socially mediated activities as the driving force of learning, Vygotsky contended that all humans undergo a process of learning regulation and that children can be seen to have a “Zone of Proximal Development” (ZPD) (Vygotsky, 1986). According to Vygotsky, the ZPD refers to the difference between what a child can do on his/her own and what this child can do in collaboration with a more skilled partner. Collaborative learning, Vygotsky argued, happened on a three-level scale: phylogenesis (learning is passed through generations), ontogenesis (leaning is acquired as the individual becomes an adult) and microgenesis (learning takes place in a local, particular environment). In this respect, just like Vygotsky, SCT literacy researchers view learning as the cornerstone of human development, and collaboration as the main process through which a person becomes literate. Opposing the autonomous model, Gee (2000), argued that “reading and writing only make sense when studied in the context of social and cultural practices of which they are part of” (p. 180). This view of learning and literacy as mediated practices was also shared by Alvermann (2008) who emphasized the idea that “texts” are cultural constructions that incorporate various sources and have gone through various human mediators. In this respect, as Perry (2012) suggested, “it is more appropriate to speak of sociocultural perspectives as a collection of related theories that include significant emphases on the social and cultural contexts in which literacy is practiced” (p. 172). In helping debunk the notion of literacy as a fixed set of skills which, once acquired, offered the “literate” people an advantage over others living in oral cultures, SCT paved the way for New Literacy Studies (NLS) and for a solid critique of the autonomous model.

The publication of four germinal ethnographic studies: *Psychology of Literacy* (1981) by Scribner and Cole, *Narrative, Literacy and Face in Interethnic Communication* (1981) by Scollon and Scollon, *Ways with Words* (1983) by Brice Heath and *Literacy and Theory in Practice* (1984) by Street offered comprehensive insight into literacy as a situated, social practice. Most notably, these studies recognized a different model of literacy, i.e. the “ideological’ model” (Street, 1994) that, the authors felt, was more appropriate in discussing the various practices, both oral and written that fell under the
umbrella of “literacy”. Moreover, the “ideological model” recognized that “the meaning and the uses of literacy practices are related to specific cultural contexts and [...] these practices are always associated with relations of power and ideology and [...] they are not simply neutral technologies” (Street, 1994, p. 139). In the same vein, Scribner and Cole, Scollon and Scollon and Brice Heath’s ethnographic work brought to the fore the ideas that situated context is vital in the study of literacy and that written and oral language coexist rather than stand in opposition to each other in literacy practices. Moreover, as Lapp, Moss and Rowsell (2012) aptly noted, the benefits of perceiving literacy as ideological, situated and dependent on practice allowed researchers, “to evaluate information through analysis of culture, class, gender, and issues of power, intention and authenticity” (p. 368). Last, but not least, NLS brought to attention two notable concepts: “literacy practice” (Scribner & Cole, 1981) and “literacy event,” (Brice Heath, 1983). Scribner and Cole (1981) defined literacy practices as “tasks that humans engage in when they are directed to socially recognizable goals and make use of a shared technology and knowledge system” (p. 236). The concept of literacy practice opened new horizons in understanding literacy as situated in specific cultural and linguistic contexts, rather than as a skill that people have. On the other hand, the concept of literacy event defined as, “any occasion in which a piece of writing is integral to the nature of participants’ interactions and their interpretive practices” (Brice Heath, 1983, p. 93) was taken up by other literacy studies that focused on investigating the interplay of literacy practices and literacy events in numerous contexts (Goodman & Wilde, 1992; Kneller & Boyd, 2008). More recently, some literacy researchers have criticized the usage of “literacy event” and questioned the idea of purely situated literacies, especially in the context of the propagation of media and social media practices (Brandt & Clinton, 2002; Street, 2003; Barton & Hamilton, 2005). In this respect, Brandt & Clinton (2002) stressed the importance of analysing how the global impacts local practices and how the growing roles of technology in our social exchanges, were, according to these scholars, important elements that need to be taken up in literacy research.

2.2. Multiliteracies and multimodality

The rise of the Internet and computers have contributed to another reconsideration of how people engage with literacy. As computers, faxes, and word
processors became the norm in the literacy practices of the late 1990s, researchers focused their attention on how the new computing-mediated media influenced communication. In 1994, Cazden, Cope, Fairclough, Gee, Kalantzis, Kress, Hull, Luke, Luke, and Nakata met in New London, New Hampshire, to address the “state of literacy pedagogy”. Their article, “A Pedagogy of Multiliteracies: Designing Social Futures” published two years later, identified the need to address the contexts in which children engaged in learning in a globalized and technologically advanced time. Drawing attention to the danger of schooling concerned with “formalized monolingual, monocultural, and rule-governed forms of language” (The New London Group, 1996, p. 61), these researchers called for the development of a literacy framework that prepared students to negotiate a multiplicity of modes and discourses. The New London Group argued that in a diverse and increasingly inter-connected society, educators can no longer speak of a “literacy” regardless if it is “autonomous” or “ideological”. Instead, the NLG argued, literacy researchers should consider two fundamental questions: the “what” of literacy pedagogy, namely “what is it that students need to learn” (p. 66), and the “how” of literacy pedagogy, “the range of appropriate learning relationships” (p. 66). In this respect, the NLG preferred to use the term “multiliteracies” instead of “literacy” as the “metalanguage” (p. 68) that describes how the teachers and students act as co-creators and “active designers-makers-of social futures” (The New London Group, 1996, p. 64). Additionally, the NLG recognized “Available Designs”, “Designing” and the “Redesigned” as fundamental processes of meaning-making that include modes other that written text. “The multiliteracies approach placed literacy at the center of cultural, economic and technological change” (Rebmann, 2013, p. 245), but, argued that text and communication relied on modes of meaning other than language.

Recognizing that “in a profound sense, all meaning-making is multimodal” (p. 70), the NLG argued that communication is blend of “Visual Meanings (images, page layouts, screen formats); Audio Meanings (music, sound effects); Gestural Meanings (body language, sensuality); Spatial Meanings (the meanings of the environmental spaces, architectural spaces) and Multimodal Meanings. Of all the modes of meaning, the Multimodal is the most significant, as it relates to all other modes in quite remarkably dynamic relationships” (p. 70). While “A Pedagogy of Multiliteracies: Designing Social Futures” did not go into details about what exactly multimodality is and how it affects the way people engage with literacy, it was a remarkable step in recognizing that texts are
not unimodal (just writing), but are products of a “range of historically available choices among different modes of meaning” (p. 70). It was ultimately the NLG who set the stage for an entire new field of inquiry into modern communication: multimodality.

As a social semiotic theory with a broad frame of interest in power, representation and communication, multimodality crystalized into a distinctive field by 1999 (Jewitt, 2008). In time, it has gained the attention of accomplished researchers in the field of literacy who had been part of the NLG (Cope & Kalantzis, 2000; Kress, 1997, 2003) alongside many younger researchers who have not been part of the original NLG (Ormerod & Ivanic, 2002; Pahl & Rowsell, 2006; Jewitt, 2009; Rowsell, 2013). These researchers argued compellingly that various modes (gesture, gaze, tone, image), and their combinations or “modal orchestrations” (Rowsell, 2013) are the crux of communicative and literacy practices.

The term multimodality – an orchestration of multiple modes to communicate, represent, and express meanings – attends systematically to the social interpretation of a wide range of communicational forms used in making meaning. Multimodality includes methods for analyzing visual, aural, and embodied communication; it attends to spatial modes of communication and the relationships between the two. (Rowsell, 2013, p.38)

Indeed, according to Kress and Van Leeuwen (2001), when people engage in communicative practices, they have an interest in meaning making. Meaning is accomplished through modes and semiotic resources and by employing the processes of transformation and transduction. Modes include not only the traditional meaning-makers, reading and writing, but also gesture (Kress et al, 2001; Martinec, 2004); gaze (Bezemer, 2008); voice and sound (Van Leeuwen, 1999); colour (Kress and Van Leeuwen, 2002); image and language (Lemke, 1998; Kress & Van Leeuwen, 1996). These modes, the proponents of multimodality argued, are shaped through cultural, social and historical uses and they accomplish different communicative work and have differential potential effects (Jewitt, 2011, p.15). A mode is a socially-constructed, a socially-validated and a socially-practiced convention (Kress 2011, p. 59). Semiotic resources are the actions, artefacts or materials that can potentially create modes (Van Leeuwen, 2004). For example, Van Leeuwen explained, our vocal apparatus is a semiotic resource for a mode (e.g. voice or laughter). The bones and muscles in our shoulders are the semiotic resources for another mode, gesture (e.g. the shrug of a
shoulder). But, as Van Leeuwen pointed out, semiotic resources have a certain materiality and a set of affordances “based on their possible uses and these will be actualized in concrete social contexts where their use is subject to some form of semiotic regime” (Van Leeuwen, 2004, p. 285). Because semiotic resources and modes are sensitive to the changes of modern communication, both are constantly subjected to transformation (Kress, 2010).

Transformation is defined by Kress (2010) as change that can occur within a mode and it reflects people’s ability to repurpose semiotic resources for different outcomes: for example, a gesture that symbolizes something in one culture, may not mean anything in another. In terms of literacy studies, an example of modal transformation would be the translation of a poem from one language to another: the poem can still be presented in the same mode (writing), but some meanings can be lost (or changed) in translation. Last, but not least, transduction, a term coined by Kress (1997) refers to a more complex engagement of modes: when writing is remade as drawing and speech is remade as gesture, a book is turned into a movie, we are witnessing a remaking of meaning across different modes. When a researcher analyses a process of transduction, Kress argued, he/she needs to ask what is gained and lost in the social semiotic process.

By looking at individuals as active creators of modes, multimodality extended SCT’s preoccupation with socially-mediated activities and as Ranker (2008) put it, it argued that through “an ongoing process of production and communication-a process referred to as semiosis” (p. 200), meaning is created through the use of various semiotic resources that are available within the social context. While New Literacy Studies (NLS) developed from the desire to “use ethnographic methodologies to look at ways of being and doing in communities and place an understanding of literacy within a wider understanding of everyday life” (Street, Pahl and Rowsell, 2011, p.194), multimodality, “placed text-making within a social semiotic tradition, and understood signs as being multimodal, imbued with intention and culturally shaped and constituted” (Street, Pahl and Rowsell, 2011, p. 194). Multimodality assumes that while modes (image, sound, gesture, speech) are shaped through cultural, social and historical uses, they realize different communicative work and have differential potential effects for learning. Modes impact “how learners create different pathways through texts. The choice of mode, then, is a central aspect of the epistemological shaping of knowledge and ideological design”
Multimodality rejects a rigid behaviourist communicative model (the sender and receiver exchange a fully formed message) and, instead, places emphasis on the ways in which the sender engages in a modal “assembling processes” (Rowsell, 2013) that the receiver decodes/interprets based on his/her sociocultural abilities. This type of modal combination or assemblage, can, according to Rowsell (2013), take multiple communicative forms: Transmodality—“an interdependence between visual modes and sound modes in film” (p. 21), Intermodality—“links between modes that can exist separately, but that can cross-reference each other, they complement each other, but stand apart” (p. 21) and, Intramodality—“these subtle, nuanced orchestrations of modes are alive and well, showing how producers manipulate the affordance of modes for on an optimum effect, impact or salience” (p. 21). Analyzing how modes come together in the communicative process can be done, according to Jewitt (2011) in at least three different ways: Social-semiotic (Kress & Van Leeuwen, 2001), systemic-functional (O’Halloran, 2004) and through multimodal interactional analysis (Scollon & Scollon, 2003; Norris, 2004). While social semiotic analysis looks to theorize and research how modal resources are used in a social context, it places emphasis on the choices made by people from a plethora of available modes. The systemic-functional analysis is preoccupied with finding a metafunctional system - in the form of a grammar - that maps the available semiotic discourse. Finally, multimodal interactional analysis is a more localized approach and “sets out to understand and describe what is going on in an interaction. We analyze what individuals express and react to in specific situations in which the ongoing interaction is always co-constructed” (Norris, 2004, p. 4).

Last, but not least, multimodality researchers are interested in investigating communication in the context of the introduction of digital technology. They recognize that “new technologies do play a central role in how modes are made available, configured and accessed” (Jones, 2011, p. 123) and that “in the age of digitization the different modes can be operated by one multi-skilled person using one interface” (Kress & Van Leeuwen, 2001, p. 2). Because digital technology relies heavily on sounds, image or movement and allows an easy manipulation (recording, disseminating, editing, storing) of communicative elements, some researchers (Cope & Kalantzis, 2000; Alvermann, 2002; Leander, 2007) have used multimodality to analyze how digital technology impacts the process of communication, while others have focused on how

A lot of interesting research has been done in relation to the new forms of multimodal literacy practices: blogging, culture jamming (Lankshear & Knobel, 2003) podcasting (Smythe & Neufeld, 2010), mobile culture (Leander & Vasudevan, 2009) and gaming (Schamroth & Rowsell, 2017). This inevitably gears the discussion towards the ways in which new media technologies blend various modes. Kress (2011) argued that researching modes and their semiotic resources can be quite daunting: “from a multimodal perspective, it becomes difficult to see what principles of coherence might unify them […]. Socially, a mode is what a community takes to be a mode and demonstrates that in its practices. It is a matter for a community and its representational needs” (p. 65). To answer these needs, Rowsell and Sheridan (2010) called for researchers to examine how literacy practices enabled “individuals to achieve their goals to develop their knowledge and potential and to participate fully in their community and wider society” (p. 3). Finally, those who work on multimodality are also interested in looking at how students make use of resources that are available at a given moment in a specific communicational environment to realize their interest as makers of a message/text (Jewitt & Kress, 2003, p. 17).

It is therefore imperative to be mindful of these nuances while discussing the impact of digital technology on what counts as literacy in our ever-changing sociocultural landscape. Moreover, responding to the need to investigate the effects of digitization, we can infer that “text” is no longer defined as a paper-based entity, but rather as a “multimodal intentional representation with purposes and boundaries, understood within a given sociocultural domain” (O’Brien & Schraber, 2008, p. 66, cited in Marge & Van der Weel, 2016, p. 124). As the social landscape of the late 1990s continued to change, researchers in multiliteracies and multimodality, began to recognize that the new forms of meaning making were increasingly mediated by new tools such as hyperlinks, hypertext, web browsers, computers and mobile devices. Literacy practices were rapidly becoming “digital”. 
2.3. Digital Literacy(ies)

Defining digital literacy, given the ubiquity of the term in contemporary society is somewhat challenging. Lankshear and Knobel (2008) refer to digital literacy as a “framework for integrating various other literacies and skill-sets, without the need to encompass them all or to serve as one literacy to rule them all” (p.4). In the same vein, Jones and Hafner (2012) speak of digital literacy “not just as a way of making meaning, but also as a way of relating to other people and showing who we are” (p.26). In an age where the availability of digital devices fosters a plethora of emerging literacy practices: Instagramming, memes, engaging with augmented (AR) and virtual reality (VR) apps in devices such as the Oculus Rift etc., I agree with Lankshear and Knobel (2003) and with Poyntz and Hoechsmann (2012) that it is more appropriate to speak about digital literacies instead of digital literacy. Using the plural highlights, as Jones and Hafner (2012) noted, that digital literacies refer not only to communication (operating) in a technological milieu, but also to the multifaceted competencies afforded by the digital tools people use. Referring to somebody as “digitally literate” could signal, according to Jones and Hafner (2012) that a person can move easily between different digital literacy practices and can maneuver confidently different mobile technologies.

A review of research in digital literacies shows that, over the past few years, quantitative and qualitative researchers have been preoccupied with the uptake of digital literacies in general, but few studies have provided an in-depth analysis of digital literacy practices in schools. Blackwell, Lauricella and Wartella (2014) focused on how early childhood educators reacted to the introduction of mobile devices in schools and concluded that more experienced teachers were more reticent to embrace digital technologies (laptops) in classrooms. In the same vein, Green, Yu and Copeland (2015) argued that with the growing prominence of digital environments, more research should focus on how teachers plan and monitor the way students respond to the wealth of information they encounter online and how both students and teachers should “appropriately vet and integrate” the information they receive via online sources. Hatlevik, Guðmundsdottir and Loi (2015) addressed the issue of digital diversity competence in upper secondary students in 43 Norwegian schools. The researchers concluded that strategic use of information predicted “the variation in students’ digital competence” (p.1) and a digital diversity of the objects the students came in contact
with. Bulger, Mayer and Metzger’s (2014) quantitative study focused on predicting proficiency in digital literacy in 150 college students. The researchers concluded that academic experience, rather than technical knowledge was the major predictor in students’ digital literacy proficiency since the ability to integrate and organize the online sources in their papers yielded better outcomes in terms of the quality of the students’ papers. Mohammadyari and Singh (2015) focused on the impact on blogs, podcasts and wikis. The authors used survey data from an unspecified number of New Zealand adults and concluded that “digital literacy facilitates the use of e-learning and should be considered when examining the impact of the latter on performance” (p.11). More recently, Radovanovic, Hogan and Lalic (2015) explored the digital divide between teachers and students in higher education. Employing statistical methods and drawing from Weber’s theory of stratification, the authors concluded that the educators’ reluctance to adopt new technologies in their teaching is a reaction to the technology’s capacity to challenge the educators’ expertise and preferred teaching materials. Pangrazio (2016) focused on young people’s digital practices, especially on “digital design literacy” (p.163) and emphasized the need to cultivate both in teachers and in students a “critical disposition in a context in which technical proficiency is prioritized” (p.163), as well as the need to bridge the divide between theory and practice.

As the above-mentioned studies have shown, there are limited numbers of qualitative digital literacy studies that address children’s ability to, in the words of Edwards-Graves (2011) be “technoliterate”, that is to successfully “blend technological and literacy skills” (p.50). But seeing digital literacy just as a competence, a skill that can be mastered once an individual “uncovers” the ins and outs of a digital tool, is not sufficient. Looking at digital literacy beyond mastery and proficiency, beyond, “the ability to adapt the affordances and constraints of these tools to particular circumstances” (Jones & Hafner, 2012, p. 27), means gearing research towards understanding the “semiotic activities mediated by the electronic media” (Thorne, 2013, p. 192). When perceived as a semiotic activity, rather than just as a competence or a mastery, the concept of digital literacy can provide literacy researchers a rich venue for exploring the new communication milieu as well as the new types of relationships that are formed in the digitally mediated space. In this respect, classroom observations of the uptake in digital technology are useful in offering insights into how digitally-mediated activities impact classroom and teacher-student relations.
Bigum and Lankshear (1999) noted that the introduction of digital devices has produced significant changes in the way people consume/produce literacy. It has not only increased and diversified the semiotic resources people draw upon in their literacy practices, but it has also set the stage for a “digital mindset” that values innovation, creativity and collaboration in putting together resources and “knowing how to proceed in the absence of existing models” (Lankshear & Knobel, 2003, p. 173). This rise of the digital mindset is particularly visible in today’s classrooms. As the LAUSD experiment has shown, schools are sites that involve different agendas and a striking “divergence in mindsets” (Lankshear & Knobel, 2003, p. 50); they are spaces where teachers and students, despite their good intentions, may disagree over how to use technology.

Traditionally, schools have operated on the principle that the teacher acts as an authoritative agent able to sanction what counts as knowledge (Lankshear & Knobel, 2003; Gee, 1990). The type of knowledge imparted by the teacher (propositional knowledge) could not be questioned in classroom interactions and was supported by the book-centered Euro-Western tradition of schooling (Lankshear & Knobel, 2003). However, over the past few years, the delivery of propositional knowledge has been seriously challenged by the rise of digital technology because “for perhaps the first time in human history, new technologies have amplified the capacities and skills of the young to such an extent that many conventional assumptions about curriculum and pedagogy became inappropriate” (Lankshear & Bigum, cited in Lankshear & Knobel, 2003, p. 69). The new mindset (digital) that is starting to carve a space in classroom interactions does not look at literacy as a static process, but rather as a fluid, innovation and collaboration-friendly process which thrives in “contexts where there are few or no established rules and procedures, or tries to break rules creatively or invent new rules and conventions” (Lankshear & Knobel, 2003, p. 82). The new mindset does not rely on propositional knowledge, but rather on performance knowledge: while propositional knowledge emphasizes that knowing, thinking, cognition, and believing are located within the individual person (Castells, 2002, 2011), performance knowledge (also called by Lankshear & Knobel (2003) “performance epistemology”), invites a more collaborative rapport between students and teachers, is more welcoming of trial and error and experimenting with different types of literacy practices (Lankshear & Knobel, 2003).

While propositional knowledge is still dominant in classroom instruction, over the past few years, the role of performance epistemology has become more prevalent. Moreover,
with learning and communication becoming increasingly multimodal (Lankshear & Knobel, 2003; Jenkins 2006; Rowsell & Decoste, 2011; Jones & Hafner, 2012; Poyntz & Hoechsmann, 2012), the role of the teacher started to change significantly. In the interactions they observed, Lapp, Moss and Rowsell (2012) noted that teachers are becoming “co-constructors of knowledge with their students, they assume the role of co-learners by acknowledging that students may know as much or more than they do about certain topics. This role is antithetical to the transmission model whereby teachers impart knowledge to students as they passively accept it” (p. 368).

In this respect, the iPad represents an excellent research milieu for analyzing how students co-construct knowledge and develop their collaborative skills and challenge teachers’ propositional knowledge, because “no previous technology for literacy has been adopted by so many, in so many different places, in such a short period, and with such profound consequence. No previous technology for literacy permits the immediate dissemination of even newer technologies of literacy to every person on the internet by connecting to a single link on a screen” (Coiro et al., 2008, p. 3). Additionally, the iPad’s ability to recall competencies that are not taught in class (basic operation issues such as connecting it to a projector or activating the text-to-speech feature) shows how this digital technology has the potential to disturb the well-established dominance of propositional epistemology and of the teacher’s role as the gatekeeper of knowledge.

As the emerging literature on classroom iPad usage has shown (Simpson, Walsh, Rowsell, 2013; Fisher, Lucas & Galstyan, 2013; Bechorner & Hutchinson, 2013; Falloon & Khoo, 2014; Walsh & Simpson, 2014), research in multimodal digital literacy needs to “reconsider classroom practices and their socio-materiality and reflect on the challenges that a mobile conception of society brings” (Mifsud, 2014, p. 46). In their research on iPad usage, Walsh and Simpson (2014), noticed a shift in the teachers' positioning themselves as the most useful source of knowledge for student learning to a more collaborative stance in which “both teachers and students need to be able to make meaning in multimodal and digital forms of increasing complexity” (Walsh & Simpson, 2014, p. 109). Bechorner and Hutchinson’s, 2013 qualitative study “iPads as a Literacy Teaching Tool in Early Childhood” focused on how pre-school students engaged with iPads and concluded that given the iPad’s ability to “connect reading, writing, listening, and speaking naturally within one app” (Beschorner & Hutchinson, 2013, p. 22), children
could blend their individual competencies in successful ways while working in groups. Recognizing that “the reading paths down which the students travel, are not only non-linear and multimodal, but multidirectional, where the term multidirectional is taken to refer to interaction across interrelated textual dimensions and platforms,” Simpson, Walsh and Rowsell (2013, p. 124) pointed out the need for more research on how the haptic (touch) engagement with tablets influences meaning making. The authors juxtaposed working on iPads independently versus in groups and pointed out that what initially looked like “goofing around” (shrinking and enlarging text through touching the iPad interface), proved to be “instances where students honed in on specific content that they found particularly interesting and compelling” and revealed an “engagement with the iPad as a material interface within which students manipulate their thinking processes” (p. 124). Simpson, Walsh and Rowsell called for more research on the role of touch in motivating students with different levels of reading ability (struggling and high fluency) to “equally partake in touch practices together” (p. 129). In terms of collaborative work using iPads, Fisher, Lucas and Galstyan (2013) compared students’ use of iPads and laptops and concluded that one of the main advantages of the iPad’s design was its portability and the ability to be manipulated by more than one person. As opposed to the iPad, laptops, Fisher et al. argued, were perceived as a “private property” and less amendable for collaborative work. Falloon and Khoo’s (2014) study lamented the lack of research undertaken on how small groups of young learners use iPads collaboratively. Their qualitative study explored how a group of 5 years old students engaged with iPads in numeracy and literacy activities that required collective participation and problem-solving skills. They concluded that while the iPad did offer unique potential as a shared device, the teacher’s pedagogical role in mediating the problem-solving activities was critical.

Responding to Simpson, Walsh and Rowsell’s (2013) call for more research on how students with different levels of literacy ability engaged with each other, I was drawn to Drs. Toohey and Dagenais’ multi-sited (India, Mexico and Canada) projects involving second language learner children creating videos. While I did not participate in these projects, I was their research assistant on another video making study a few years later and became interested in how young children engaged in video making after reading Dr. Toohey and Dr. Dagenais’ 2012 article “Second Language Learners Making Videos in Three Contexts”. The authors emphasized the urgency for educators to “consider how
video as both a form and an educational process encourages students to ask higher-level critical thinking and compositional questions, and how their pedagogy directly influences that process” (p. 89). Noting, in the same vein, that the work of NLG emphasized the importance of observing students in environments where they engage with the complexities of an increasingly multicultural world, I found research in video making in general, and in video making on iPads in particular, to be a potential great milieu for showing how multimodality could contribute to qualitative studies on digital literacy practices. Recognizing, as Rebman (2013), that video making “exposes children to diverse cultures” and engages them in “activities which require fluency and competency with various technologies” (p. 253), I conducted an extensive literature review on projects which focused on youth making videos. I surveyed the field for reports on conventional video making (that used tape not SD card cameras) and for reports on mobile or digital video making (that used iPads or smartphones).

As video making became more accessible to students, researchers worked to uncover the intricate processes that involved youth working on video projects (Goodman, 2003; Miller, 2007; Bruce, 2009; McKenney & Vogt, 2011; Fern & Schul, 2011). In Teaching Youth Media: A Critical Guide to Literacy, Video Production and Social Change, Goodman described his experience working with low income New York-area students who engaged in out of school video-making projects. Goodman saw the video creating projects as empowering, helping students “defamiliarize the familiar, taken-for granted conditions of life” (p. 26). Through documentary-making internships and video-making workshops, Goodman argued that students gained a better understanding of the intrinsic power of blending visual, aural and narratives in their video-making and finding their voices and fighting oppression. Other studies looked at in-school video making projects. In their qualitative study in video production in the primary school language arts curriculum, McKenney and Vogt (2011) examined teaching strategies that could enable students to create videos and develop their communication skills. Decrying the lack of literature on incorporating video-making activities in classrooms, as well as the difficulties of working with a limited number of video cameras, McKenney and Vogt noted how the teachers’ strategic planning in designing video-making projects could potentially engage students in creating meaningful videos. While they only focused on the first phase of video-making project: project planning and establishing the video-making strategies that would be taken on by the students, the
authors found video-making projects to be highly motivating for classroom instruction because they had the potential to foster collaborative practices between teachers and students. Bruce (2009) provided a quantitative study of video making practices in a group of high school students and noted that video making can be ‘rebranded’ as video composition. This way, Bruce hoped, seeing video making as video composition brings to the fore the differences between traditional (pen and paper) composition strategies and the new, digitally facilitated, media-produced video composition that is gaining more followers in the current communication milieu. Noting that there are fundamental differences between print and video composition practices, such as modality of expression, task setting and the roles of teachers and students, Bruce observed that “video composition is a complex, recursive process that allows for sequential, multimodal representation of thoughts and ideas” (p. 426). Last, but not least, Fern and Schul (2011) revealed that “new technologies can work powerfully to engage the cognitive and affective skills of teachers and students” (p. 40) and that documentary making is a powerful tool for students to present their stories.

My survey of children involved in video making projects using iPads or smartphones has not yielded many results, which is not surprising, given the fact that the iPads were introduced only in 2010 and started being used in some schools about a year later. Martinez-Alba (2014) provided recommendations on how teachers should plan documentary production projects with students who use phones or iPads. The article only provided recommendations in terms of the steps that need to be followed (searching for a topic, storyboardi ng, filming, editing), but was not a qualitative or a quantitative study per se.

However, it can be concluded from these articles that seven years after the introduction of iPads, and ten after the introduction of iPhones that both camera and mobile-device video making is still a largely untapped research topic in education. There is a need for more qualitative, in-depth studies that focus on the relationships established in the video making process between students and between students and teachers, and among students, teachers and the technologies. As Toohey, Dagenais and Schulze (2012) pointed out, researchers should allocate more time observing and documenting the processes of digitally-produced literacy objects (in our case, videos) rather than simply emphasizing the validity of the end product by trying to answer questions such as: “Are computers beneficial to learning?” or “Is videomaking enhancing
student engagement in classroom activities?” In this respect, my thesis will continue Drs. Toohey and Dagenais’ work on documenting the process of digital production – in this case the network of students and iPad -- but it will focus on one aspect of multimodal video-making: the iPad as a video editing tool. I chose to focus on the editing aspect of video-making for two reasons:

1) While video editing in schools has been discussed in several educational studies (Miller, 2007; Ranker, 2008; Bruce, 2009; Fulwiler & Middleton, 2012) and researchers have recognized that it encompasses sets of “subprocesses that require composers to think conceptually with layers, work in multiple modes, and revisit initial ideas and reshape them as they discover emerging meaning over the temporal trajectory of their video” (Fulwiler & Middleton, 2012, p. 44), iPad video editing practices have remained largely unexplored.

2) By focusing on student video editing, I pinpoint another aspect that has been, so far, under-researched: how video editing juxtaposes performance epistemology (collaboration, improvisation) and propositional knowledge (authority, rules) in a digitally-mediated space.

2.4. Video editing in the digital age

As I have shown in the literature review on video making, when discussing the processes that involve movie making in schools, some researchers (Ranker, 2008; Hafner & Miller, 2011; Miller, 2013; Getto, 2013) have written about “video composition” without providing a comprehensive definition of the term. In a 2013 survey of digital video-making practices in classrooms, Miller remarked that “although interest in promoting digital video composition for use in schools has grown, much of the work occurs outside of schools (Hull & Schultz, 2003; Goodman, 2003; Hull, 2003; Hull & Nelson, 2005)” (p. 408). This situation, Miller concluded, was being rectified: classroom-based digital video making and editing projects were slowly carving a space in the curriculum in schools where teachers fostered the exploration of multimodal and multiplatform composition. The same phenomenon had been already observed a few years before, by Ranker (2008) who documented two students’ video compositions as they created a documentary about the Dominican Republic. Ranker noted the ease with which the students were able to move across multiple media (surfing the web, writing a
script and operating the camera equipment) as well as the variety of semiotic resources they engaged with in creating their movie. Ranker placed special emphasis on the students’ ability to create meaning though video composition, a process which he equated with video editing. More recently, Hafner and Miller (2011) reported on a student-centered digital video project in Hong Kong in which college students created and shared a documentary. Viewing the student as “an active agent who brings his or her unique learning characteristics to the social learning context” (p. 69), the authors maintained that a learner-autonomy based pedagogy in movie making fosters reflection, experimentation and learner participation in the movie editing (composition) process. Getto’s (2013) qualitative study details how two teams of students engaged in producing two different multimodal products: a simple website and a short documentary. Comparing the variety of semiotic resources that the students drew upon as well as the types of interactions that he observed, Getto concluded that the most important resource the students mobilized for both projects was “knowledge itself, indicating that the most important aspects of digital composing may be in-depth, practical knowledge of technologies, modes and the genres they involve” (p. 33).

As we can see from the above-mentioned articles, when referring to video editing as a post-production step in digital camera film making, many researchers use the terms “video composition” and “video editing” interchangeably. However, I will henceforth refer to editing as “composition” since, as my analysis of the students engaged in iPad multimodal practices has revealed, “editing” does not encompass the layered, recursive, multimodal processes that come into play in the final stages of making a movie. As Bruce (2009) and Ranker (2008) aptly noted years before the introduction of iPads and other mobile platforms, movie “editors” are more likely to be referred to as composers and orchestrators of various modes, rather than operators in the realm of stitching together scenes in a linear fashion. True, the filmmaking process in the late 2000s, when Bruce and Ranker conducted their studies did not involve a tablet whose versatility allowed it to be used as a camera, video camera and video editing platform. The movies Bruce and Ranker referred to were put together on computers, using specialized software, which is a far cry from the old days of movie making when negatives, rolled up in giant batches of film, were cut/spliced by hand using a special machine. The movie editor would then use a transparent tape to “stitch” together the pieces of negative and would present the “raw” footage to studio executives before the “final cut” was decided.
However, looking at movie editing as a multimodal process that recalls competencies drawn from semiotic resources outside of the classroom (Hafner & Miller, 2011; Getto, 2013) solidifies, in my opinion, the need to refer to video editing as “composition”. As the analysis chapters will show, the students and the teachers I observed engaged in a series of recursive revisions, heated negotiations, as well as in a constant battle between the primacy of digital or print. The last few days of movie-making, which coincided with what traditionally would be called “editing,” were intriguing and rich in multimodal interactions. Using the term “editing” to refer to these three days, would deprive the analysis of the multilayered collaborative processes that unfolded.

2.5. Compositing and recursivity: new perspectives in digital video composition

In order to analyze the data I gathered over the three days of video-making, I found Fulwiler and Middleton’s (2012) article “After Digital Storytelling: Digital Composing in the New Media Age” extremely useful in providing an understanding of what the last days of video production entailed. While Fulwiler and Middleton’s article did not go into specifics about how conventional understandings of video composition were influenced by print composition, they hinted at a connection. I will explore this connection in the brief review I provide below of the ways researchers approached the composition process before digital and video composition emerged as literacy practices.

Print composition studies have preoccupied researchers for many decades. However, a perspective that gained prominence during the early years of print-based composition studies, was the “stage model,” as exemplified by Rohman (1965) who outlined the “steps” necessary for writing a successful essay. The three elements at the center of the writing composition process were: “prewriting/ writing and revising” (p.57). This stage model emphasized the idea that writing is merely a reflection of what already has been planned in the writer’s mind and that writing (when planned carefully) was a linear process that allowed edits, but not major revisions. It took several decades for this idea to be challenged. Researchers in composition studies argue that 1971 “was the year when the field of composition moved from an almost exclusive focus on written products to an examination of composing processes” (Clark, 2012, p. 158). In 1971, Emig’s article “The Composing Processes of Twelfth Graders” called into question the linearity of the writing composition process. She observed that not all students pre-
planned their writing, that not all had outlines and that the paper-based writing process was non-linear and recursive. Her ground-breaking work in the field of paper-based composition was continued by Flower and Hayes (1981) in “Analyzing Revision,” by Perl (1979) “Pausing and Planning: The Tempo of Written Discourse Production” and Sommers (1980) “A Description of the Composing Processes of College Freshmen Writers”. Both Perl and Sommers provided insightful analyses on the processes of revision which, they argued, implied more than just revisiting the text.

Building upon the research in paper-based composition, Fulwiler and Middleton (2012) argued that the preeminent model for digital video composition in schools should be modeled after the Center for Digital Storytelling (CDS) program (www.storycenter.org). The CDS model emphasized “video composition as sequential, based on discrete steps: write/film/edit” (p. 41) and mimicked the view of composition advanced by Rohman rather than the one proposed by Emig, Perl and Sommers. While the CDS model was then taken on by other programs such as the American Film Institute’s ‘Film Your Issue’ and by the DUSTY (Digital Underground Storytelling for Youth) program in Oakland, CA, Fulwiler and Middleton recognized that the movie instructors’ role as gatekeepers of knowledge was constantly reinforced by a “lock-step” formula: writing/ filming/ editing, which allowed little or no room for improvisation and creativity in the video production process. Fulwiler and Middleton argued a “linear model that always begins with ‘write’ and ends with ‘edit’ presents composing as discrete and bounded, rather than synchronous, dynamic and simultaneous act of composing with a variety of modes” (p. 42). They urged researchers to change their focus: “we should not rest on the fact that new media tools shift traditional notions of text-based practices, but rather must encompass the realization that an important set of new processes intrinsically tied to new technologies has come to light” (p. 43). In this respect, according to Fulwiler and Middleton, the linear CDS model left unaddressed two key video composing processes that were prevalent in young students’ video making practices: Compositing and Recursivity. They defined Compositing as the process “which consists of a kind of cognitive wrestling: a variety of modes and their separate meanings must be prioritized, while simultaneously the interaction of these same modes in any given form of video must be addressed” (Fulwiler & Middleton, 2012, p. 43). Compositing relied on a constant tweaking of video segments in the editing interface and could be better understood as a process of multimodal layering in which disparate modes (image,
sound, video) are “fitted together and adjusted in such a way that their separate identities become invisible. The result is a single, apparently seamless image, sound, space or scene” (p. 43).

On the other hand, Recursivity, referred to as “interactivity” by Ranker (2008) and “looping” by Manovich (2001), was defined by Fulwiler and Middleton as: “the process by which composers circle back through the progression of composites to assess the video’s themes, tone and narrative direction, a process which requires working with all the modalities (alphabetic text, still/moving images and sound) and escapes the tidy confines of a sequential model” (Fulwiler and Middleton, 2012, p. 43). Recursivity is not a simple revisiting process; rather, it is a process where meaning is constantly recreated as composites are shifted around, modified or deleted. It goes against static linear models that assume that meaning is something attained at the end of the videomaking process (Ranker, 2008). In new media composition practices, the logic of meaning being found at the end of the production is challenged by the affordances of the digital devices. In the same vein, Gilje (2010, p. 495) agreed that studies on young people’s composing practices have increasingly paid attention to the multimodal dimension of editing thanks to the affordances of editing software that enables content production and distribution on a scale previously unimaginable.

By unpacking the processes of Compositing and Recursivity in movie making, Fulwiler and Middleton (2012) argued, literacy researchers could tap into a series of unexamined processes in terms of digital composition, in a time when mobile devices offer potentials for creativity, control and speed in completing a movie. The same view was echoed by Walsh and Simpson (2014) who argued that now, more than ever, the user has tremendous power to manipulate their digital devices: deciding what to keep, what to delete, how to order the scenes, what music and voice-over recordings to add means than one haptic (touch) engagement with the device (Walsh & Simpson, 2014) could alter the movie’s entire meaning. In this respect, Hafner and Miller (2011) noted, digital technology changed classroom dynamics in the sense that it created “opportunities for learners to exercise their capacity for autonomy by providing an environment in which they can negotiate new roles as learners” (p. 68). On the other hand, studying the students’ engagement with iPads in the process of digital composition may provide insight into the types of resources and tactics they employ in creating a multimodal product and may offer, as my analysis will show, a view into the tensions that
occurred between the teachers’ insistence on using a paper-based literacy logic in video composition, versus the students’ resistance to a linear, carefully planned video-making process. As Rowsell and Harwood (2015) aptly pointed out, as students enter more formal schooling environments, they seem to be losing a degree of power, but “children’s use of touch-based technologies exhibit productive, playful tactics that they use to access a plurality of meanings in the digital media that are not always present within the structured spaces and strategies implemented in the early years” (p. 137). In this respect, focusing on the three days of iPad digital composition provided a treasure trove of information on how multimodal literacy processes allowed students to engage in exploratory actions, to take risks and improvise when pressed by time and circumstances.

2.6. Actor-Network Theory and the Obligatory Passage Point

Research on multimodality suggests that people engage with the world through the semiotic resources they acquire throughout their lives (Gilje, 2010), yet multimodality does not fully address the issue of the materiality of literacy practices. As Rowsell (2013) pointed out, “in today’s digital world, we have multiple modes of meaning-making: sounds, images, hypertexts. Yet, within literacy education, even ‘new’ literacies, we know relatively little about how to work with and produce modally complex texts” (p. 47). In this respect, research that adopts multimodal perspective needs to acknowledge the gaps in understanding the processes of text and video composition. In order to achieve these goals, literacy researchers need to take into consideration not only the semiotic resources the students rely on (Ranker, 2008), but also how they engaged in recursivity and compositing (Fulwiler & Middleton, 2012). Moreover, a study of digital composition, I believe, needs to be mindful of the material agents that participate in video production. As my analysis chapters will show, the iPad, the paper-based storyboard and script, were, alongside the students and the teachers, the main actors in the process of video composition. I believe that an adequate analysis of video composition cannot ignore the materiality of the iPad, or the affordances of the three video composition tools (the device, the storyboard and the script). The materiality of the iPad, the storyboard and the script and their role in creating the movie, called for a theoretical lens that focused on materially-mediated interactions. This lens, I believe, albeit less known in literacy
research carries a lot of potential in addressing the role of material objects in communication.

If NLS investigated how people engaged in literacy practices as active members of a community, this other lens, Actor-Network Theory⁹ (Callon, 1986; Latour, 1979, 1987, 1988, 1999, 2005; Mol 2002; Law 1992, 1999, 2004, 2006, 2008, 2009), shifts the focus from individual humans to individuals and their engagement with material objects. Actor-Network Theory (henceforth, ANT), perceives human activity as socio-material, meaning that humans engage with others in materially-mediated interactions. Perceiving human activity as socio-material is not an idea that originated solely with ANT. In fact, as Fenwick, Edwards and Sawchuck (2011) noted, a number of other theories such as Complexity Theory, Cultural Historical Activity Theory, and Spatiality Theory focused on how humans interact with objects. However, ANT is particularly well-suited for unpacking the processes through which humans and objects create connections (networks) and maintain, break or re-create them (Law, 2008). This focus on unpacking the processes of materially-mediated interactions is reflected in Toohey and Dagenais’s (2012) remark that observing processes of video making rather than focusing on the end results (finished videos) should be of interest to literacy researchers. Focusing on video editing as a composition process where the material actors (iPad, storyboard and script) carry as much importance as the human actors (students, teachers, video instructors), shifts the analysis from human interactions to human and object interactions. This shift highlights how complex semiotic resources of the material objects are more than simple mediating tools for humans in the video making process. Rather, they are seen as active participants in multimodal literacy practices alongside humans. As Rowsell (2013), remarked, “making meaning specifically and literacy more generally must, however, be seen as materially oriented” (p. 12). This observation is particularly important, because as Ehret, Hollett and Jocius (2016) and Leonardi (2010) noted, the uptake of digital

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⁹ In 1973, Latour received an invitation from a friend working at the Salk Institute in La Jolla, CA. While in California, Latour conducted an ethnographic study of scientific laboratory practices as he became fascinated with the heterogeneous and messy nature of research. Of particular interest to Latour were the steps taken by the scientists from messy observed phenomena to producing structured theories. For Latour, the ethnographic study revealed that scientific knowledge is a product, an effect of an extremely complex network of people and objects. These complex networks are so closely intertwined that they eventually become naturalized in the form of what he called an actor-network.
technologies in classrooms begs an analysis of “how” students create music, take and manipulate pictures or use various apps.

The focus on unpacking the processes of digitally or materially-mediated interactions is very enticing to a literacy researcher familiar with the tenets of ANT: while ANT has a long and complicated history, it is difficult to pin down its intellectual lens. According to Law and Singleton (2012) ANT is, “better understood as a sensibility” (p. 2) rather than a “theory.” ANT emerged from ethnomethodology and generative semiotics as well as from an opposition to the Cartesian dualist philosophy lineage of Kant and Derrida. Latour, Law, and Callon the three initial proponents of ANT, rejected the idea that technology was created and used by powerful humans to “aid” them in navigating through their daily routines (Latour, 1987). Instead, these sociologists claimed, society is comprised of complex, heterogeneous and constantly changing ‘actor-networks’ (Latour, 1987), in which all entities (human and material) are equally influential and indispensable to one another. By placing equal importance on humans and non-human actors in societal interaction, ANT postulated that: “the actor-network should not [...] be confused with a network linking in some predictable fashion elements that are perfectly well defined and stable, for the entities it is composed of, whether natural or social, could at any moment redefine their identity and mutual relationship” (Callon & Law, 1989, p. 39).

In this respect, analyzing how the human and non-human participants in the actor-networks engage in short or long lasting, fragile or stable relations is the main goal of an ANT researcher. I believe that ANT is therefore particularly well-suited for analyzing the complex relationships that are enacted in the process of digital composition. It helps document how disputes over control of the material device (the iPad), which involved creating, maintaining and breaking alliances and dominated the last three days of the video-making project, brought to the fore tensions between propositional and performance epistemology.

In holding the belief that “the distinction between human and non-human is of little initial analytical importance” (Law, 2007, p. 8), dubbed the “Principle of Symmetry”, ANT argues that agency is not an a priori capability, but as Ehret, Hollett and Jocius (2016) observe, is born inside the actor-network in the process of power negotiations between the participants. As my analysis of the video composition process shows, agency is indeed not a fixed, stable notion, but it rather ebbs and flows, and is directly
dependent on the alliances formed and on the types of competences called on by the students.

Moreover, ANT is particularly well suited for iPad digital composition research, because it provides the literacy researcher with a vocabulary needed to describe the versatility of the digital object involved in movie creation. A defining principle of ANT, “Blackboxing”,\(^{10}\) claims that each material object (an iPad, for example) appears to be a unitary material form so “stable that the recipients will accept it and carry it forward, rather than picking it to pieces” (Blok & Jensen, 2011, p. 37). Drawing attention to how material actors tend to be “blackboxed” in fixed, pre-determined roles, invites the researcher to think about the processes through which objects become so naturalized that they are encapsulated in a “box” (concept, persona, object, system). In this respect, ANT has been extremely useful in researching what roles and to what extent various textbooks and curriculum-related documents circulate in the school network (Lenters, 2011) and influence literacy processes (Hamilton, 2009). In my thesis, I use ANT’s principle of Blackboxing to examine how the collaborative actions undertaken by students and the teachers reveal strengths and weaknesses of the device’s embedded components: the apps (GarageBand and iMovie).

As my analysis will show, the iPad is only seemingly a simple, easy to operate device. However, as the process of composition unfolds, the discrepancies between the students’ ability to engage with the device reveal how each student perceives the iPad in a different manner and how he/she uses it to gain recognition within the group. For example, as I will show in Chapter 4, uncovering the iPad’s text to speech capabilities, a feature that one of the students has clearly acquired outside the school, helps him gain the position of “tech person” and shields him from the uneasiness he feels towards engaging with paper-based literacy.

Last, but not least, ANT proved to be particularly useful in unpacking the tensions that occurred throughout the video composition stage, tensions that, at times, placed the students and the teachers in opposite camps. ANT’s “Principle of Translation” (Law 2008) postulates that human and non-human actor-networks are never stable, solid and immutable, but rather fragile and prone to dissolution (Latour, 1988). The mechanisms

\(^{10}\) Latour (1987) borrowed the term from cybernetics and used it in his book, *Science in Action*
that keep an actor-network “alive” are dictated by the human and non-human actors who constantly negotiate positions in the network. However, in order for an actor-network to survive, ANT claims, the human and non-human actors need to engage in a number of processes, or stages. These stages were detailed in Michel Callon’s (1986) germinal study, “Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of the St. Brieuc Bay” which detailed marine biologists’ and local fishermen’s struggle to reach a consensus on how to save the scallops in St. Brieuc Bay, France. The article described, in detail, the complex negotiations carried out between scientists and fishermen driven by a common goal, but committed to different methods to achieve it. Observing the negotiations between the two parties, Callon concluded that the fishermen and the scientists engaged, unbeknownst to them, in four distinct collaborative stages. These stages, Callon argued, were:

1. Problematization—when some of the human actors sought to become indispensable to other human actors, by suggesting that they have the competency to identify the problem and to solve it by bypassing “obligatory passage points.” (The scientists presenting themselves to the fishermen as indispensable in saving the mollusks).

2. Interessement—when actors (scientists) entered in a process of negotiation with other actors (fishermen), trying to compete for certain roles in providing a solution of the problem.

3. Enrollment—when actors learned which roles they have been assigned as the result of negotiations.

4. Mobilization of allies—when actors devised strategies to present their plan credibly to others and therefore recruiting them in the project (Callon, 1986).

While my thesis does not focus specifically on these four moments of translation since, as I will show in my analysis chapters, the process of multimodal composition on the iPad is too complex, the four separate stages do occur, albeit not necessarily in this order. The students and the teachers engaged in problematization and interessement throughout the three days of video composition, and not just, as Callon’s study suggests, at the beginning of the project. The processes of interessement and enrollment were not always distinct because the students switched roles and interests based on how well
they were able to negotiate with the others and how familiar they were with the digital device. Throughout all these complex interactions, the iPad, the storyboard and the script were not static actors, but active participants in the students’ search to gain more influence within the group. Engaging in Composting and Recursivity when revisiting their movie, the human actors displayed different approaches to video composition: some students preferred to work exclusively with the digital device, others to use the storyboard and the script as a paper-based scaffold in digital composition. In this respect, at a first glance, the last three days of video-making were chaotic, hectic and hard to follow for an external observer.

However, I found Callon’s notion of “The Obligatory Passage Point” (Callon, 1986) particularly promising in shedding light on the complex negotiations and processes that unfolded throughout the days in which the students were engaged in video composition. While to this day, Callon’s four moments of translation have been mentioned, but not extensively explored in educational research (Edwards and Fenwick, 2011; Hamilton, 2016), the notion of the “Obligatory Passage Point” has remained, to my knowledge, unaddressed.

According to Callon (1986), the notion of Obligatory Passage Point (henceforth referred to as an OPP) is a pivotal element in the fluid and ever-changing nature of human and non-human interaction. Best presented as a node or a checkpoint in the human and material network, the OPP needs to be either satisfied (convinced) if it is a human actor who is in a position of authority, or understood and used, if it is a material object. Either way, the OPP is capable of controlling, regulating and overall exercising great authority in the way in which any alliance between actors is formed. As the three days of video composition unfolded, my analysis shows who/what these OPPs were, what role they assumed in the network, and how they influenced the outcome of video composition. The three days I am describing in the thesis are significantly different in terms of the outcomes: Day 1 revealed the human actors’ (the students) struggle to work with other human actors who were positioned as OPPs (the teachers). The teachers assumed positions of power and made use of propositional knowledge in order to impose a linear, step-by-step video composition strategy. The students were not allowed to work on the iPads, until they had finished the tasks given by the OPPs; in this case, the students had to negotiate roles that would allow them to satisfy the teachers’ requests. Day 2 saw an uptake in a different set of OPPs, different in terms of their
affordances: the script versus the iPad. Day 2 followed the trials and tribulations of the human actors (the students) as they tried to use the OPP that seemed more suited for their interest: one student preferred to engage in video composition using exclusively the iPad, while another preferred to check the progression of the movie against the paper-based OPP, the script. The last day revealed another aspect of the OPP’s function as a regulatory body in the multimodal composition process. As the students focused exclusively on the iPad and added voiceover narrations and put the final touches on their movie, the nature of the OPP changed: the students engaged in a painstaking process of figuring out how to import the voiceovers from GarageBand to iMovie. With both apps encountering a lot of glitches, the students engaged in activities that required improvisation and use of performance epistemology. In this respect, the last day saw the iPad turn into a material OPP which contained embedded OPPs (apps) that had to be bypassed.

I am aware that following the complex processes that unfolded over the three days of digital video composition may be sometimes be difficult for the reader. I will be more specific and provide details and examples in the analysis chapters. In this respect, I decided to allocate a full chapter for each of the three days because the concepts that I am bringing together (the pairing of multimodality, digital composition studies and ANT) are not only interesting, but novel. In the absence of literature that combines these three lenses, I will guide the reader through an exciting, fun and, I hope, compelling analysis of collaborative practices, disputes, failures and successes. The students seemed to enjoy their project and so did I. I invite you to follow me in this journey.
Chapter 3.

Methodology

This thesis was generously facilitated by my participation as a Research Assistant in a project supported by a three-year grant from the Social Sciences and Humanities Research Council of Canada (SSHRC) awarded to Drs. Kelleen Toohey and Diane Dagenais. For three months, (February through May) the research team (the two principal investigators, three research assistants and two videographers) engaged in participant observation and instruction of a group of 27 Grade 4 students who lived in a multicultural, urban community near a large park in Western Canada. The qualitative study was aimed at documenting the students' engagement with a new technology (the iPad) that had not been used previously in this classroom, particularly in group work. I fulfilled my responsibilities as a Research Assistant throughout the entire project, but, in the last phase of the project, my advisor, Dr. Toohey, graciously agreed to relieve me of my RA duties to allow me to collect the data that I am using for this thesis. I thus conducted a qualitative study of a group of five students engaged in editing a video they scripted, shot and put together about sustainability and social justice with respect to the city's major park. In crafting my methodology, I was guided by the following overarching research question:

How does a group of students engage with the iPad in creating a multimodal digital product?

To approach this question, the following sub-questions guided the study:

- What are the strategies students used in the editing process?
- What semiotic resources did they draw on during the editing process?
- How do students' strategies in editing compare to the instructions they received from teachers?
In order to address these questions, an ethnographic case study method was employed. The study was qualitative in its design and used traditional data collection methods (observations, field notes, interviewing, videotaping). I paid attention to both ANT and to multimodality’s approach to research methodology, especially since I was working in a relatively new field (digital literacy) with few studies to rely on and with extremely complex data.

3.1. Qualitative approaches

In Chapter 2, I indicated that both ANT and multimodality are perceived as serving a dual function: they are both theories (at least to the extent to which ANT researchers agree that this is a “theory”) and methodological approaches or “sensibilities” (Law, 2009), that provide a lens to investigate sociocultural milieus. However, neither ANT nor multimodality have clearly defined methodological trajectories (Latour, one of ANT’s proponents, simply urged qualitative researchers to “follow the actors” (1987, p. 59), without indicating who those actors are – objects/people/both –, except that they are the “network builders,” meaning that they are the actors who can, potentially, create and keep a network together. As Cressman (2009) put it, “it is usually the case that ANT looks to the network builders as the primary actors to follow and through whose eyes they attempt to interpret the process of network construction” (p. 3). ANT researchers embrace participant observation and interviewing to obtain information about a group of individuals and, in this respect, they rely on ethnographic approaches to research (Hammersley & Atkinson, 1997). ANT researchers try to shed a light on the intricate and heterogeneous nature of human and non-human interactions. However, ANT researchers prioritize collecting different accounts/perspectives of a single event over finding emerging patterns, as is typically done in ethnography, because actor-networks can be created and dissolved in unpredictable ways.

Mindful of the fluidity of the world and fragility of networks, ANT sociologists (Law and Singleton, 2005) advised against rigid categorizations that result from coding in analyses of data. The phenomena that researchers observe, they argued, are never fixed or permanent, everything is replaceable: a new network of humans and non-humans can replace an existing one. In their exploration of laboratory life, Woolgar and Latour (19790 followed an approach similar to “following the actors” to document the fluidity of network relations and Law and Singleton (2005) did so more recently in a
series of studies on alcoholic liver disease. But using a single ethnographic account as the main frame for ANT studies, is also strongly encouraged, as illustrated by Mol’s (2002), work on the ontological perceptions of arteriosclerosis. Mol’s ethnography follows the trajectory of one actor, a disease, from its symptoms to the diagnosis. As Mol noted, the process that requires a series of tests and multiple doctors’ visits, sets in motion a complex collaborative action between people and machines. The doctors’ ability to diagnose the disease, Mol argued, stems not only from their previous encounters with the symptoms, but also from the confirmation they received through the medical devices and tests that were conducted. Hailed as an example of how ANT researchers render the complexity of the phenomena they observe without falling into rigid categorizations and facile generalizations, Mol’s book solidified ANT researchers’ preference for qualitative studies. As Law (2009) noted, the ANT researcher is an ethnographer who spends a great deal of time thinking how to deal with the uniqueness of the ethnographic accounts, because researchers may see an event differently every time they revisit it. ANT researchers reject neatness, pre-existing research models and are perfectly at ease with creating its own methods based on the researcher’s observations. Methodologically, ANT is uncomfortable with practices that push the researcher to “do your methods properly. Eat your epistemological greens. Wash your hands after mixing with the real world” (Law, 2006, p. 2), because producing ‘clean data’ and ‘warrantable findings’ might come with “the guarantee of a good shelf life (Law, 2006, p. 2), but fail to reveal the complexity of the world we inhabit. In this respect, ANT is most comfortable with what Joseph Maxwell (2005) called “narrative/connecting analysis” (p. 96), an ethnographic approach that uses transcriptions, memos, observation notes but does not to “fracture” the data into discrete segments and re-sort them into categories. Instead, it attempts “to understand the data in context using various methods to identify the relationships among the different elements” (p. 98). I will further elaborate on Maxwell’s narrative analysis in the data collection/analysis section below.

The second theoretical lens, multimodality, also diverges from traditional ethnography. As Gunther Kress (2011) observed, ethnography is “the old kid on the block” (p. 369) with an extensive repertoire of tested methodologies that do not cover the complexities of multimodal interactions. In analyzing the ways participants engage with different modes and objects, traditional ethnographic methods are useful, but insufficient.
Atkinson (cited in Dicks et al., 2011, p. 230) suggests that multimodality researchers need to focus more on the “soundscapes and visual phenomena” and not allow them to be treated as just as “detail, background” (ibid.). In this respect, ethnography’s preoccupation with understanding social interaction was taken on by multimodal researchers who added a layer of complexity by looking at communication from a multi-faceted perspective: image, speech, gesture, movement, and sound. For example, multimodal researchers (Kress, 2011; Flewitt, 2011) looked at ethnographic methods as potentially helping multimodal research. Flewitt’s research on children’s literacy practices employed ethnographic methods of data collection, but placed special emphasis on how different modes were influencing the research process. In Flewitt’s view, ethnography needs to embrace multimodal communication because it offers “broader social and cultural framings of layers of social complexity” (Flewitt, p. 302).

Mindful of the interconnections between ANT and multimodality (the fact that both aim to expand ethnography’s reach beyond coding (ANT) or beyond description and analysis of a single mode of communication (multimodality), I found Flewitt’s (2011) question and response particularly helpful for my study:

What can a social semiotic approach to multimodality offer to ethnographic studies? Essentially, it offers a set of theorized analytic tools which can reveal the intricacies of how social and cultural norms, relationships and identities are played out through discursive and institutional processes in diverse modes. (p. 296)

In this respect, my study of iPad video composition practices borrows from ethnography a sensibility for acknowledging my subjectivity as a researcher, while constantly being mindful of the layers of sociocultural contextual complexity that come into play when going in the field. In this study, I employed some traditional ethnographic methods, such as participant observation and interviewing.

A second qualitative approach I employed in my research is case study. Merriam (1988) defined case study as “an examination of a specific phenomenon such as a program, an event, a person, a process, an institution or a social group” (cited in Creswell, 2011, p. 229). A case study “zooms in” the researcher’s gaze to a manageable level of observation and seeks to facilitate “understandings of complex situations, understandings that cannot be made explicit in most other research designs” (Barone, 2004, p. 25). The unit of analysis can be multiple cases—a multisite study—or
a single case—within site study. While my research design called for a within site
descriptive case study (it was conducted in one site, Clarke Elementary), I found that an
intrinsic case study—a type of case study where the subject itself is the primary
interest—(Creswell, 2011, Yin, 2009; Stake, 2006) of a group of five students worked
best at rendering the potentially complex interactions between students and the device.
Moreover, the advantages of conducting an intrinsic case study helped illuminate my
main research question that focuses on the co-constructed nature of knowledge, and
increased the study’s transferability—making the study potentially relatable/applicable to
other research contexts/situations that focused on a relatively new digital technology (the
iPad).

Since both intrinsic case study and narrative/connecting analysis) share similar
data collection procedures such as participant observation, direct observations,
interviews, audiovisual documentation and artifact examination (Yin, 2009), my research
design used them in conjunction. In the next few pages, I will provide a detailed account
of the participants, the context, my role in the research process, and the data collection
and analysis.

3.2. The project

Overall, the larger project in which my study was situated looked at the
processes involving video making using iPads, from the decisions the students made
regarding the resources (images and videos they used) to how they worked with the
teachers and one another in creating their videos. The data for the larger project were
collected over a period of three months, during which time the students were introduced
to the researchers, the teachers presented them with the theme of their project (chosen
together with the research group) - environmental sustainability and social justice with
respect to the major park near the school. From February to May, the students
participated in the following activities, presented here chronologically. Over the first few
days of the project students met the researchers, engaged in activities to familiarize
themselves with the iPads and learned about the topic of their documentary movies.
Then, they made two visits to the park with their teachers and the researchers, facilitated
by a representative of the park’s Ecological Society. After that they made another visit to
the park led by a First Nations educator. On all these visits students took videos and
pictures. Following this, they received a classroom visit from a history professor. In
addition to this, students viewed a number of short documentaries, they received instruction in video making from the professional videographer, in photography from myself. Students then wrote a script, produced a storyboard and revisited the park to record sounds of nature, more videos and images, and engaged in video composition. Over the course of three months, the students were involved in this process for a total of 15 days. Of these days, the last three were spent putting together (editing/composing) their video using iMovie and GarageBand. The data I collected for the thesis were gathered during these last three days, when I worked independently from the rest of the research team to more closely document what took place in a group of five students.

3.3. Participants and context

The researchers’ primary consideration for choosing a site of research was finding a school and a group of teachers interested in using iPads and who would welcome a research team in their classroom. The research project involved two professors, three research assistants - including myself - a videographer from a local film society and a university videographer. A couple of months before the project started (February), the research group met with teachers from another school located in a culturally vibrant and diverse area of the city, but, unfortunately, after a month of meetings and negotiations, the researchers and the teachers could not reach a consensus over the research topic. I had, on this occasion, the opportunity to gain first-hand experience in the difficulties of negotiating entrance to a site and of reaching an agreement with all the parties involved in educational research. Luckily, teachers at the second school were more receptive. The site matched our group’s search criteria for a place with a high number of EAL students coming from diverse sociocultural and economic backgrounds. After a first meeting with the teachers and the principal, Drs. Toohey and Dagenais invited the entire research team to meet the teachers and visit the school.

Clarke Elementary was built in the early years of the 20th century and has been in use ever since, serving residents in this urban setting. It served a population of about 590 students from Kindergarten to Grade 7. Approximately 33% of the students are deemed to be English as an additional language learners (EAL) and 9% are designated as having special needs. The school is located in an area near a beach and within walking distance from a large city park. A mixture of modern high rises and older
buildings surround the school and a vibrant and a multi-aged community inhabits the neighbourhood. The school’s main building is an impressive brick construction (high ceilings, huge windows). Right next to it is an adjoining two story building where some of the school’s classrooms and our research site were located. The classrooms in this newer building were small, the ceilings low and the hallways and facilities a bit run down. As one of the teachers confided “budget is always an issue and you can see that as soon as you walk in”. The school had a third building, called “The Annex” that was located a few blocks away and housed students from Kindergarten to Grade 3. Two playgrounds and a green fenced area on the school’s main grounds allowed students to relax and play during recess. The students spent time playing basketball, walking, running or chatting. The school has a website and the school’s newsletter is periodically updated on it, but many other link buttons are inactive. At the time our data collection, the only active links on the webpage were the “technology link” (labelled as such) which contained information regarding Internet safety as well as a list of “Don’ts” regarding Internet use.

3.3.1. The classroom

The classroom was located on the second floor of the newer building. The desks were arranged in three rows of two desks touching one another (10 desks/row) facing the teachers’ desk and chalkboards with four large windows in the back. The entrance was located on the same wall as the boards. When entering the classroom, the teacher’s desk was to the left and there were five desks pushed against the far-left wall. They were used by students as storage space for their bags and clothes. In the back of the classroom, right under the windows facing the street, I noticed a small shelf, containing approximately 30-40 books on nature and history. In the far-right corner of the room, two other large desks were used as a computer station. The classroom was connected to an adjacent room by a door on the right wall, which allowed students to move from one space to the other without walking in the hallway. This adjacent room was sometimes used for the instruction of adults in the District’s Continuing Education program, and was thus sometimes unavailable to the children.
3.3.2. Participants (human and non-human)

The teachers

Ms. Warren, the Grade 4 teacher, had been working at Clarke Elementary for almost 20 years. While I did not formally interview her (another RA conducted those interviews), we had a few short, informal conversations. She told me that she was not a heavy user of technology, but that she used email and the internet daily. She maintained and updated the classroom website and used it to keep the parents informed on their children’s projects and encourage them to get involved in extracurricular activities. For example, she reported that she encouraged the parents to go with their children to the park and recreate the trips that were taken in this project, so that they learn more about the community. During classroom activities, I always felt welcomed. Mrs. Warren was friendly and patient: she made sure that she explained to the students who we were and the reasons why we were observing the classroom. I noticed that she was encouraging, patient and supportive of her students. She praised students who were paying attention, by pointing them out as examples of proper classroom behavior. Often times, I would hear her say: “If you could all take a look at Peter and Laura and follow their example, that would be great”. Moreover, her gentle, encouraging attitude was complemented by a great deal of trust in the students. Her attitude towards them reflected a desire to instill a sense of responsibility. I asked her if she was afraid the students might lose the iPads and she said that she was not because they had been working on responsibility in taking care of things. Up to the very end of the research project the students were extremely careful and gentle with the iPad devices, which were donated by the principal investigators to the school after the completion of the project.

Working with Ms. Warren was Ms. Peterson, a technology ‘helping teacher’. In this capacity, she visited many classrooms in the district and advised teachers and students on productive uses of digital technologies. She came in to Ms. Warren’s class quite often during our observations either to take notes and observe the students working with technology or intervene and help those who seemed to struggle. Ms. Peterson’s pedagogical style was perhaps sterner than Ms. Warren’s, but she always made herself available to students. Often, as I will show in my analysis chapters, Mrs. Peterson would stop by and insist that the students pay attention to the teacher/videographer and the board and “stop playing” on the iPads. While I did not
gather much information about Mrs. Peterson, I could tell that the students liked her and that they had a good rapport with her.

The students

The class had a total of 27 students, the vast majority of whom were either first generation Canadians or had recently moved to Canada. They came from very diverse cultural and linguistic backgrounds: Australia, China, Japan, Vietnam, Romania, Mongolia, Ethiopia, the US and Canada. Before receiving the 6 iPads, Ms. Warren put the students in groups to work on the devices. Not knowing if the students chose their teammates or not, I asked Ms. Warren how she formed the groups. She replied that she did not want students who were good friends to be in the same group for fear that they might exclude others and she felt that making the students work with others they had little interaction with would replicate “real life experiences, where not everybody who is friends with another person has to work together.” As part of my agreement with Drs. Toohey and Dagenais, I focused solely on a group whose iPad was named “Coyote” during the last three days of video making. The “Coyote” group intrigued me from the very beginning, because of the dynamic among its members. Initially, the group had five members: Carrie, Dana, Ralph, Harrison and Mark.11 Throughout the project, as I got to know most of the students, I was able to gather, through informal conversations, tidbits about each students’ background: Carrie was born in Canada, had a younger sister and loved technology. She could not wait to grow older so she could get her own smartphone and use her mother’s iPad on a regular basis. She seemed to come from a financially secure family. The second student, Dana, quickly positioned herself as the leader of the group, delegating tasks to others and trying to hold on to the device for as long as she could. According to Ms. Warren, she was a very good gymnast and she was often absent from school because she participated in regional and national competitions. While she was an active presence in the group throughout most of the project, Dana missed the last two weeks of school and the project and did not take part in video editing. The third student, Ralph, was born in Romania and moved to Canada with his parents when he was two years old. His family owned and operated a well-known pastry shop downtown, which I used to visit often. Being Romanian, I related to Ralph who spoke the language very well. Ralph was an interesting, kind and caring student.

11 All names have been changed to preserve the participants’ identity.
However, Ms. Warren seemed quite concerned with the fact that, throughout the project, he would miss school on the days when our research team came in. She knew that it was not an issue of ethics, the parents agreed in writing to allow us to film and talk to their son, but she could not figure out why Ralph was staying home on these days. On one occasion, as we were walking in the park, I asked Ralph if he liked the project. He told me that he liked it very much, but that his mom and dad were not very happy that the teacher was “wasting time with iPad projects when we could do Math. So, sometimes, I stay home with my dad and we do Math”. An engineer by training, Ralph’s father moved to Canada and started a pastry shop, but kept his sights on his son’s progress in “hard” sciences. I did not tell Ms. Warren about our conversation, but Ralph all but disappeared in the last month of our classroom visits and he was also absent during the last days of video editing. Harrison was born in Canada and his parents had moved from Japan three years before his birth. He was a kind and funny boy, always with a smile on his face and a friendly attitude. He liked technology, but admitted that his parents were strict and that he was not allowed to play on the computer more than one hour a day. The last member of the group, Mark, was born in Ethiopia and had two younger siblings. A bright and engaged student, Mark had difficulties reading and writing and was, according to Ms. Warren, “about a grade behind the others in reading.” Mark reported during our informal conversations that he did not own a tablet, but that he had a friend who owned one and that he would spend a lot of time playing on his friend’s device. Clearly the most technically-inclined of all the members of the group, Mark took on a more leading role in the group after Dana’s departure and was actively involved throughout the entire project in all aspects of video editing.

**The non-human participants**

In order to track the students’ progress, I proposed that each team’s iPad be identified with a group’s name. Besides a label attached to the back of the device containing the names of students in the group, I set up a different wallpaper on the main page of each iPad depicting an animal or bird that can be seen in the park. These strategies helped identify the devices by the following names: Rabbit, Coyote, Mallard, Squirrel, Great Blue Heron, and Fox. The iPads were equipped with an app originally called “VideoCamera” produced by i4software. However, as of March 2013, the app was renamed “Vizzywig.” The app, the winner of 2012 MacWorld exhibit Best of Show prize, captured images in various resolutions (1920x1080; 1280x720; 640x360), had
camera manual focus controls, and allowed for the manipulation of exposure and white balance. As a bonus feature, the app could be connected to up to five other devices for multiple angle camera shooting. The app’s editing interface, allowed previewing, trimming, duplicating and clip repositioning as well as adding music and customizable titles and scrolling credits. Additionally, the iPads were equipped with iMovie for video editing and GarageBand for sound and voiceover recordings. The videographer from the local film society asked the researchers to equip the iPads with external microphones, but given their short connective cord and difficult configuration, the students did not use the microphones more than once.

**The Researcher**

I entered the site as a research assistant and was extremely excited to work on this project because it brought me back into the classroom, and in a position that I enjoy immensely: working with children. Before moving to the US in 2004 to pursue a Masters in English, I worked for three years as a teacher of English as a Second language in a Hungarian-speaking school in my native Transylvania (Romania). Transylvania, the western region of Romania, has a population of 7.5 million, out of which approx. 75% are Romanian, 19% Hungarian, 3% Roma (Gypsy) and 2% German. Using Hungarian in the classroom was easy because I was raised bilingual (I am half Hungarian and half Romanian). My teaching background over these three years included working with 150 students (Grades 2-8) a week. After all these years, stepping in the hallways of Clarke Elementary brought back fond memories: I was back in an environment that I love.

The project also appealed to me especially because I am a heavy user of technology and I have acquired over the years a good command of a few programming languages (especially Java) thanks to the help of my husband, a Computer Science professor. I own a variety of devices on both platforms (iOS and Android), I am an experienced amateur photographer and I own a couple of high end, professional cameras. My interest in technology is also influenced by my personal relationships: almost everybody I know works in the field of computer science. Through our numerous conversations, I developed a sense of how computer scientists think about technology, but I do not share most of my friends’ unbridled enthusiasm regarding only the positive changes that technology can bring to our lives. In this respect, the type of research initiated by Drs. Toohey and Dagenais was pioneering, because it provided a first-hand
account of how technology was used in a classroom setting and it offered insights into what educational research can learn about the literacy practices afforded by the students’ interaction with the iPad.

In terms of my initial engagement in the project, my responsibilities included videotaping, storing the data, transcribing and coding the data using StudioCode™. I was actively involved in all the phases of the project, was present on almost every school visit, minus one visit to the park, and throughout the three months of data collection, I made myself available to the principal investigators whenever I was asked. However, since the logistics of the research could not allow the entire research team (two investigators, three RAs, and two videographers) to be in the classroom at the same time, we agreed to videotape and observe the students on a rotation basis so that the children would not feel too overwhelmed. Fortunately, the project’s design allowed, as Lincoln and Guba (1985), noted “frequent, continuing, and meaningful interactions between the investigator and the respondents or objects of investigation” (p. 107). Drs. Toohey and Dagenais made sure that contact between researchers and the teachers was maintained, and when a member of the research team was not present in the classroom due to scheduling conflicts, he/she was updated on the project’s progress.

As the project moved to its final phase and the students started compositing their videos, my responsibilities shifted towards collecting my own data. While the videos I shot for the larger project were recorded on analog video cameras and yielded tapes that had to be digitized, for my own study I stored the videos I recorded on a couple of SD cards that I would download and store on my computer, then back up on an external hard drive at the end of each day of video editing. After three days of shooting, I had recorded approximately 20 hours of video. Additionally, to ensure my meaningful participation as a researcher in the process, I kept a reflexive journal (Eraldson, Harris, Skipper and Allen, 1993) to ensure credibility and transferability. Since credibility in qualitative studies is defined as the ability to demonstrate that there is a link between findings and the reality, I used the reflexive journal as another data source (alongside video and field notes) to ensure triangulation. Transferability, defined by Lincoln and Guba (1985) as the ability to provide evidence that the findings can be applied to other contexts, was ensured through the reflexive journal that provided a “thick description” (Lincoln and Guba, 1985, p. 114) of my experience during data collection. At the end of the data collection, I interviewed (using a semi structured approach) the students in the
3.4. Data collection

As Creswell (2013) observed, "new forms of qualitative data continually emerge from literature, but all forms might be grouped into four basic types of information: observations (ranging from nonparticipant to participant), interviews (ranging from close to open ended), documents (ranging from private to public) and audiovisual materials (including materials such as compact discs, photographs and videotapes)" (p. 345). In this respect, it is important to note that data collection is a series of overlapping activities aimed at gathering good information to address the research questions and that given the holistic nature of this qualitative research, some forms of data collection were added as we went through the research process.

Participant observation is one of the most widely used data collection methods in qualitative research, and according to Angrosino (2007), it involves noting a phenomenon in the field using all five senses. While “writing down everything is impossible” Cresswell (2013, p. 240), the researcher needs to determine an observation protocol that best suits the situation observed. In this respect, my engagement in the data collection was varied and it was based on the necessity of filling in for some of the team members: it shifted from (using Cresswell’s terminology) nonparticipant—my role in the first two fieldtrips was to gain an overall understanding of the group by taking field notes and, on two occasions, videotaping the classroom—to participant as observer—meaning that I participated in the activity on the site when I showed the students how to work on some apps (when they created a digital postcard on Vizzywig).

Although I was not familiar with the video features of the camera I found it relatively easy to operate. While videotaping, I became aware of two issues: I found it difficult to equate being a videographer with being a nonparticipant, based on the fact that it became obvious from the very beginning that a videographer’s role is slightly more intrusive than one of observer: as I was videotaping, the students were more aware of my presence, would laugh and wave at the camera and even ask questions about the equipment I was using, despite my explicit care in keeping a somewhat comfortable distance. The second issue that became apparent very quickly was that, as a
videographer, especially when handholding the camera, I could not perform traditional observation roles, namely taking field notes. I compensated for this disadvantage by recording as much narrative description of the events I observed as I could, upon my return home.

While field notes often have paramount importance in the process of ethnographic data collection, the study’s main data came from audiovisual materials, namely video and photographic materials. My camera was positioned most of the time on a tripod, and, from time to time I used my iPad as a floater, therefore supplementing the video data with pictures and images taken from a different angle. For my own data collection, I relied primarily on field notes and on the video data thanks to the fact that the camera shot videos in HD. In terms of my own study, video data offered a view of the multimodal processes employed by the students in their group work, that would be otherwise impossible to capture by field note-taking alone. Since I felt that it was important to document how the students constructed their films, at the end of the research project and before we handed out the devices to the students to keep them for good, I took screenshots of the entire timeline and stored the images alongside the videos and the scanned paper documents on my computer. Afterwards, I transferred all my data to an encrypted external hard drive.

3.5. Data analysis

3.5.1. Organizing the data

As Huberman & Miles (1994) noted, the processes of data collection, analysis and report writing are not always distinct steps in the research process, and they can be interrelated and oftentimes, go on simultaneously. The contour of the data analysis process in general and my analysis process were recursive. Between “entering with data of text and images and exiting with an account or a narrative, the researcher touches on several facets of analysis and circles around and around” (Cresswell, 2013, p. 370). It became particularly relevant to me as a researcher that a good data analysis protocol is intrinsically connected to a good data storage strategy. In relation to video editing and its recurrent, cyclical nature, I was particularly interested in documenting all the steps taken by the participants in the process of creating the movies. Without a good data log
protocol, however, it would have become extremely difficult to trace the videos that were deleted or subsequently added in the process of editing.

3.5.2. Data organization protocol

At the end of the fieldwork day, I made sure all iPads were taken back to Dr. Toohey’s office for data retrieval. Since the devices turned out to be quite difficult to work with in terms of fast data access, I searched for an easy way of downloading the data without going through iTunes and wasting precious time with device synchronization. I found that the best way to retrieve data was using an iOS application called “Image Capture”, that allows direct and rapid access to the iPad’s “photos” file. Once I selected all the videos and pictures taken that day on a particular device, I transferred the information to a folder on the computer and from there to a secure hard drive. After the transfer to the hard drive was completed, I deleted the information from the computer. I followed the same protocol for my group’s iPad as well as for all other five iPads, with the exception that I copied the videos from the SD card to my laptop and from there on an encrypted hard drive. In this respect, I feel that using a digital camera instead of a traditional camera sped up my data retrieval considerably. While digitizing video tapes could take up to 24 hours, I would have my videos transferred from my camera to my computer and from there to my hard drive in less than one hour.

For each day of my data collection, I employed the same system I put in place for the rest of the project: Each day of fieldwork had a designated master folder that was labeled by date, location, and participants. Additionally, the daily master folder contained three sub-folders: video data from the camera; images and videos from the researcher’s iPad and the daily field notes. This data distribution ensured not only easy access to all the video documenting data, but it was used to look at each group’s work individually in terms of how and what they added, deleted, and even reshot from one day to the next.

3.5.3. Classifying, Transcribing and Interpreting Data

The challenging thing about classifying and transcribing data stemmed from the difficulty of “how to capture, define, analyze, and represent the meaning potential of diverse, interwoven semiotic modes” (Flewitt, 2011, p. 295). At the end of the research, my data consisted of approximately 20 hours of video footage, an audio recording of me
interviewing the three students using structured and semi-structured questions, one page containing the students’ script, a two-page storyboard, 27 iPad screenshots of the final timeline of their video, the students’ full final video and approximately 65 photos I took using my iPad. The complexity and variety of the data (video, images, text), prompted me to look at what researchers in this field—multimodality—had to say about transcribing and analyzing. In the same vein, I searched the ANT literature for examples of how ANT researchers worked with their data, but without much success. I did, however, find Flewitt’s (2011) account of working with multimodality helpful. As she pointed out, “Multimodality scholars tend to use visual technologies for data capture, often resulting in complex multimedia data sets with still and/or moving visual, audio and written texts. The researcher must therefore take into account not only how participants communicate through diverse modes and media, but also how the data sets captured in different media ‘speak’ to each other” (Flewitt, p. 208).

Mindful of the challenges of working with multimodal data, and after much deliberation I found that the need to establish a communicative channel between these diverse data sets was best represented by what Maxwell (2005, p. 96) has called “narrative analysis”. Maxwell explained that “unfortunately, many texts and published articles deal explicitly only with coding, giving the impression that coding is qualitative data analysis. In fact, most researchers informally use other strategies as well; they just don’t describe these as part of their analysis” (p. 96). In qualitative analysis coding “fractures” (Strauss, 1987, p. 67) the data, allowing it to be rearranged into categories that “facilitate comparison between things which belong to the same category or organizing the data into broader themes. As opposed to a purely thematic or category comparison method, Maxwell proposed that multimodal qualitative data should be examined from a different angle: “instead of fracturing the initial text into discrete segments and re-sorting it into categories, connecting analysis attempts to understand the data in context and identifying the relationships among the different elements of the text. Examples of connecting strategies include profiles and vignettes (Seidman, 2013) and narrative analysis (Coffey & Atkinson, 1996; Reissman, 1993).

Bearing in mind the importance of understanding the diversity of the data that were gathered during the three days, I found Maxwell’s narrative analysis that focused more on vignettes (episodes) more useful in accomplishing ANT’s dictum “follow the actors” with the complexity of multimodal data. In order to provide a rich, narrative
analysis (Jacob, 1987) I reviewed the entire footage covering the video editing practices (approx. 20 hours) five times to ensure that I had a good chronological understanding of the events. At this stage, I did not want the research questions to influence the way I related to the data and I did not look for instances in the data that would provide validation for my questions. Instead, after reviewing the footage, I read and re-read all my field notes in the research journal. I re-watched the videos and looked at the pictures that I took. Realizing that I was dealing with a large amount of video data which captured a myriad of interactions, most of which were unique (due to the versatile nature of the iPad the students did not engage in many repetitive actions), I decided that it would be helpful to write out a very detailed narration of the entire three days as they were captured by the video camera. This initial narrative was 76 pages long and helped me locate and retrieve specific episodes that I will refer to in my analysis. Having identified connecting themes that challenged my assumptions, I went back to the video data and transcribed each of the three days, producing a document that totaled 234 pages. While recognizing that transcription is a common academic practice that has been associated with turning a strip of naturally occurring talk into writing, Bezemer and Mavers (2011) asked: “how do researchers transcribe gesture, for instance, or gaze and how can they show to readers of their transcripts how such modes operate alongside speech? Should the researchers bother to transcribe these modes of communication at all? What are the epistemological implications of choices of inclusions and exclusion?” (p. 195). Many researchers in the social sciences have included in their transcripts line drawings (McDermott, Gospodinoff & Ayon, 1978), stills from video footage (Heath, Hindmarsh & Luff, 2010) and musical notation (Erickson, 2004; Benzemer & Mavers, 2011), and both Norris (2011) and Bezemer & Mavers, (2011) stress the importance of recognizing that a multimodal transcript will differ from one researcher to the next due to their different sensibilities in working with data. Moreover, a multimodal transcript brings to the fore a central methodological concern, namely “the principles of selection and omission that are in play as the researcher transcribes the selected strip of interactions” (Bezemer & Mavers, 2011, p. 195). Of course, a transcription is not a mirror image of the multimodal interaction, but is a reconstructed product in which, just as Kress noticed about ‘natural’ interaction, one mode will always gain prevalence. In this respect, an important problem raised by Benzemer and Mavers is the layout:

Multimodal transcription is not just a case of choosing image or writing, but also making decisions about how these will be set out on the page or
screen. Whether a transcript consists entirely of writing or entirely of images, or a multimodal mixture of the two, researchers use spatial organization to construct separation and cohesion, to disconnect certain parts of the writing and images and to show which parts belong together, as well as to suggest an order of attendance. (p. 202).

Initially, I found promise in Sigrid Norris’ (2004) data analysis model, called “(inter)action multimodal analysis” due to its preoccupation with encouraging researchers to develop “multimodal transcriptions” (p. 80) that no longer placed text and language at the center of the communicative practice and instead, focused on the interplay of various modes. To Norris, transcription and coding are overlapping categories, because “the transcript guides or even forces the analyst into a certain direction of analysis, which, of course, simultaneously constrains the analyst to a certain interpretation as well.” (Norris, 2011, p. 81). Below, is an example of how Norris views multimodal transcription.
Figure 3.1. Norris' example of multimodal transcription

While the interaction is represented as multifaceted, I still found it difficult to understand how the multimodal interaction unfolded, since the researcher did not offer a clear account. Norris (2004) claimed that overlapping images and text, creates a better understanding of the interactions between various actors, but I still required a detailed textual account (context) in order to understand the multimodal exchanges between the three participants. Therefore, after much deliberation, and reading about multimodal interaction analysis, I realized that, as seen in the example above, despite the rich image sequence of an interaction between students, without “context” (Maxwell, 2005) and written description, the audience can only hypothesize what is happening. I have come to understand that, when it comes to multimodality, we still have a long way from finding
ways to render its complexity in a journal article or in a thesis, namely in text. Multimodal interactional analysis lends itself more easily to a PowerPoint presentation where gestures, gaze or the position of the body can be easily rendered through playable video examples. Nonetheless, I recognize Norris’ (2011) pioneering efforts in bringing to the fore the importance of looking at interactions as occurring not only between humans, but also between human and non-human actors.

By employing a narrative analysis of the students’ interactions with technology and with other human participants (peers or teachers), I attempted to recreate Latour’s (2008) and Law’s (2006) model of “following the actors” as they worked their way through the intricate process of creating and editing a video. I broke down the analysis in three days (and subsequently three chapters) because each day provided, as you will see, different engagement with technology and fostered different rapport between students and teachers. Moreover, I focused not on repetitive actions since, quite surprisingly, I have found very few accounts of those, but rather on vignettes, episodes, that even if occurring once (as in the case of transforming the iPad into a text-to-speech device), they rendered a rich picture of how the human participants manipulated the objects in unexpected and creative ways. I supplemented these vignettes (rendered by classic ethnographic transcriptions) with screen shots taken from the video footage to provide the reader with visual reference to the interaction.

3.6. Issues of trustworthiness

3.6.1. Dependability/ Credibility

Dependability was ensured by employing triangulation of the data sources: field notes, interviews, and video data. Moreover, my role as videographer, participant observer and observer, allowed a multi-angled perspective on the study that is instrumental in providing dependable and credible analysis. Moreover, credibility was ensured by providing a thorough description of the setting and the participants that can potentially allow the reader to follow the way in which the research process unfolded, as well as to interpret the findings of the study.
3.6.2. Transferability

The way in which the study was designed—looking at digital technology in general and at the iPad’s affordances in video making in particular, and placing them in the context of students’ literacy practices, could be potentially taken on in other research projects.

3.6.3. Ethics

I was not required to obtain separate approval since I was covered under the principal investigators’ ethics approval documents. Before the classroom data collection started, the PIs received written approval from the parents to have their children videotaped, photographed and observed by the researchers. With the advent of digital technology and increasing algorithmic possibilities, surveillance is also becoming more widespread. Researchers need to be aware that video recording their subjects should require an ongoing consent. For this research project, the students were asked if they agreed to be videotaped and photographed at the beginning of each day and they were told that they have the option to ask the videographer to stop the recording at any moment, should they feel uncomfortable having the camera around them. I cannot guarantee that the children felt comfortable refusing access since they never did so. To preserve the anonymity of the participants and of the location, all names included in this thesis (the teachers, the students, the school, and the instructors) have been changed so that no connection to the real individuals and places can be made.
Chapter 4.

Day 1 Video Composition: From Script and Storyboard to iMovie

4.1. Overview

In Chapter 2, I outlined the theoretical perspectives (ANT, SCT and multimodality) that inform my analysis of the students’ activities in video composition. I also hinted that I will pay special attention to how the adults’ reliance on propositional epistemology was challenged by the students’ use of performance epistemology (using devices that were not very familiar to the adults in unexpected ways). The analysis of the last three days of the project unveils palpable tensions between the adults who emphasized the benefits of text-based literacy (script and storyboard) versus the students who moved more easily between the linearity of the storyboard and the non-linearity afforded by the iPad.

As the readers will see from my data, these tensions were also visible on an intra-group level: students who preferred using text-based literacy versus others who were not, and on an inter-group level: video instructors, who preferred the linear CDS (Center for Digital Storytelling) model of video composition (plan/ shoot/edit) versus students who favoured a recursive, non-linear process. To remind the readers, the CDS model assumes that the act of video making is akin to an archeological process of unearthing pre-existing meaning (Fulwiler & Middleton, 2012). Yet, as Fulwiler and Middleton noted, digital video making is not a rigid linear activity, but rather predicated upon multimodal engagement: meaning is neither fixed, nor a priori, but emerging from the filmmaker prioritizing one mode over another. Based on his/her experience, sensibility, talent and ability to master the digital device, the “modern” filmmaker can use a vast array of sound and video effects and modes (pictures, videos, recordings). In “traditional” (film camera) movie making, the “division of labor” was clearly defined: the director and the cinematographer (and their assistants) shot the movie, and the editor had to “piece it” together. When a movie roll reached the editor’s table, it was cut up in
pieces and taped together. The editor had the option to rearrange the pieces of film, but did not have many technological affordances to alter the movie *per se.* Today, digital film making offers significant advantages (generous space on the memory card, the possibility to erase and start over a movie without wasting actual film, and so on) that blurs the lines between the director and the movie editor. In this respect, the movie editor of today is more of a “composer” in the sense that, as Fulwiler and Middleton explained, he/she prioritizes the mode/s that convey(s) most compellingly the message the filmmaker is trying to portray.

Furthermore, after observing the various interactions among humans and between humans and iPads, I became particularly interested in the obstacles posed by the device or by the humans during three days of video composition. I wondered what strategies and resources were called upon by the students to overcome the challenges presented to them. In doing so, I followed closely both the human actors (students, teachers and instructors) as well as the non-human actors (the iPad, the apps) and drew a trajectory of the complicated processes that led to the creation of a two-minute clip. In unraveling this trajectory, I was particularly interested in how coercion and constructive criticism were exercised by both teachers and students as the levels of engagement with the technology among participants became increasingly “uneven.” Indeed, as Fulwiler and Middleton (2012) suggested, nowhere does the battle between conventional propositional epistemology (the teacher is the authority who sanctions what counts and doesn't count as knowledge) and performance epistemology (engaging with the device in ways that were not taught in classroom) play out with more fervor than in a digitally-oriented classroom project: “Nowhere does this new media epistemology beckon more compellingly than in the area of digital video, which may be the paradigmatic example of a multimodal text with the potential for wide-ranging cultural, aesthetic and social implications” (Fulwiler & Middleton, 2012, p. 40).

As I have shown in Chapter 2, Fulwiler and Middleton (2012) pointed out that classroom video digital composition involves a vast array of changes that see performance epistemology brought to the fore, not so much by the instructors’ volition, but as a necessity that arises during the collaborative relations established by the students in their film making process. While it is true that video making has text-based undertones (“even with the best intentions our pedagogical vision for multimedia composing in the realm of video remains print-centric” (Fulwiler & Middleton, p. 42), my
analysis shows that text-centric approaches taken by both the teacher and the videographer were challenged by the children’s incorporation of digital-centric proclivities. I believe that observing students in the video composition stage may provide curriculum makers even more reasons to continue to investigate the transformational power of technology in classroom instruction.

In this respect, Fulwiler and Middleton urge multimodality researchers to look at the nuances of video making and video composition process, to unpack the seemingly linear process of movie making on digital platforms and to provide a closer look at how exactly a video is created. To achieve these goals, my analysis focuses on: a) Fulwiler and Middleton’s recommendation to analyze the process of video editing through the lenses of Compositing and Recursivity (I have already defined them at length in Chapter 2; b) Actor-Network Theory’s “Obligatory Passage Point” (Callon, 1986) and c) multimodality’s insistence that modal orchestration plays a paramount role in how meaning is rendered in collaborative movie making processes.

Since I have devoted a few pages to defining these concepts in Chapter 2, I do not reiterate them here in detail. Instead, I focus on Manovich’s (2001) observation regarding composition because it fits very well with this thesis’s narrative. Manovich noted: “once all the elements are ready and composited together in a single object, that is, they are fitted together and adjusted in such a way that their separate identities become invisible, the result is a single seamless, image, sound, space and scene” (p. 136). How that “single seamless image, sound, space and scene” came to be is the main story of this dissertation.

Following Fulwiler and Middleton’s (2012) suggestion, I unpack the video timeline and guide the reader through the frustrating and fun road taken by the three students (Carrie, Mark and Harrison) as they worked together, tried to impose their points of view and help each other finish the project. Instead of simply claiming that compositing has textual undertones and blame some of the failures on the students’ inability to work with the written text (the script), I will focus on looking at video editing (composing) as a layering process of “multiple competing modes” (Fulwiler and Middleton, p. 47). Specifically, I will look at how and which of these competing modes (visual, audio, textual) get more or less prevalence as the video is being “built” or “layered”, when some of the modes were discarded, and what obstacles (or in ANT parlance, “Obligatory
Passage Points”), afforded opportunities for the students to employ performance epistemology (Lankshear & Knobel, 2003). It is also worth noting that my analysis draws from Callon’s (1986) definition of Obligatory Passage Point, which states that an OPP can be thought of as the narrow end of a funnel that forces the actors to converge on a certain topic or purpose. The OPP is a gatekeeper and a filter in the myriad of established connections (i.e. relationships that are enacted in the process of human interaction or human and object interaction). The OPPs establish a set of rules, or conventions without which the interaction would not take place. Moreover, the OPPs are mediators of all interactions among actors in a network, vital points which occupy, even briefly, the most powerful position in the network (Callon, 1986). However, since the topic of OPPs has been brought up sporadically (Latour, 2002), and just as a definition, my analysis sets out to show how the vast network of students, teachers, and instructors set up, bypassed, created and reshaped their own OPPs throughout video composition. I believe it is an essential and, so far, unexplored element of the burgeoning theories on materiality and multimodality.

For this purpose, I will start my analysis with a preliminary identification of the Obligatory Passage Points that come into play on Day 1. At a first glance, OPPs distinguished themselves in two categories: physical and virtual. The physical, or tangible OPPs were both human—the teachers, the instructors, the students—and non-human-- the iPad, the storyboard and the script. The virtual OPPs could be represented as: a) the iPad’s operating system (iOS 7.5 at the time the data was collected), and b) the applications the students accessed by touching the physical OPP (the iPad): Vizzywig (used for recording videos), GarageBand (used for recording and exporting the sounds) and iMovie, the main platform that was used to compose the video.

Both the existence of OPPs and the inference that video composition is a layering process of various modes brought together through repeated revisions and alterations are being supported by Fulwiler and Middleton’s (2012) observation that,

[U]nlike the clearly demarcated linearity and progressive steps in the predominant composing model (CDS), digital composing, we contend, is neither predictably structured, nor necessarily premised on the primacy of print. Second, then, we suggest that composing with video requires new skills and reference points that arise from the cultural logic of new media to guide production. (p. 40)
Here, the researchers are bringing up an important point regarding assumptions about video production: that it mimics the text-based, three-step composition process (draft/write/edit/) that dominated the paper-based composition scholarship of the late 1970s and early 1980. Yet, as composition scholars (Emig, 1971; Perl, 1979) pointed out, even writing itself was never a “linear progressive path, but a multiply recursive set of cognitive processes” (Fulwiler & Middleton, 2012, p. 41). The main issue with the sequential three-step model was, as Sommers put it, an “artificial segmentation” which curtailed expressivity and innovation through writing. Still, the draft/write/edit model remained the basis for the CDS video production, and was repurposed under a different name that spoke to video production students: “write/film/edit”. It maintained the same rigid composition stance of storylines prepared in advance (brainstorming), writing a story that seems “logical” (script writing) and finally, “gluing” together images and videos with the aid of software (editing). But herein lies a problem: “a linear model that always begins with ‘write’ and ends with “edit” presents composing as discrete and bounded, rather than as synchronous, dynamic, and a simultaneous act of composing with a variety of modes” (Fulwiler & Middleton, 2012, p. 42). In the interactions that I observed on Day 1, the CDS model challenged some students whose reading skills were not aligned with those of their peers, but whose digital abilities were very developed. A conflict ensued between the instructor and teachers and some of the students who were clearly more comfortable with a non-linear composition process. The conflict, sometimes enacted in overt physical actions (grabbing the iPad from a student, or asking him/her in stern tone to “put it down and listen”), showed the power of the linear model in the instructors’ minds and their discomfort with (or lack of recognition of) multimodal layering. Indeed, the CDS model insisted that: “the story is first constructed primarily via writing which remains an impervious privileged layer, free from addition or influence of other modalities” (Fulwiler & Middleton, 2012, p. 42). How the students embraced, at first, this linear model, and how they negotiated the fine line of working in the linear and non-linear (layered) multimodal realm of digital composition, are questions that are discussed below.

4.2. The Narrative

At the point where my analysis begins, the video project was nearing its end. During 15 full days spanning over three months, the students were exposed to a
plethora of activities, some familiar (classroom visits, field trips, taking pictures and videos on a digital device, viewing short movies), others unfamiliar (working in groups, sharing an iPad, listening to instructions on video making, interviewing an adult and creating a video as a group project). We are on the morning of April 24th and the project is scheduled to be completed by the end of April 26th. During these three days, the video instructor and the teachers have decided that the students will engage in the “video editing” process, anticipating that three days will suffice to create a storyboard, select videos and edit them together. On the morning of the first day allocated to video editing, Mark, Carrie and Harrison, the students in my focus group, are not seated together. Mrs. Warren and Mrs. Peterson are seated in the back of the class, while Tara, the film society instructor, talks to the students. She asks the students to put the iPads aside and tells them what they are expected to accomplish by the end of the day: creating a storyboard based on a script they wrote together with the teacher. The students did not appear to be highly engaged.

Figure 4.1 Students listening to the instructor

Carrie, seated in the front row, is wearing a black and white polka dot sweater. She is holding her head in her arms, covering her face as she is suppressing a yawn. Right behind her, Mark, wearing a gray and red wide striped sweater is looking at his lap while playing with a pen. Harrison is not visible in the picture.
This morning’s instruction follows the same trajectory as in the following days. Tara shows the students where they are in the process of video making (depicted linearly on the board). According to the instructor, they have finished phase 1 (brainstorming and writing a paper-based script) and phase 2 (collecting most of their video clips). She assures them that if they are missing anything, there will be at least one day where they can go to the park and record sounds or retake the shots they think they may need. She shows the class a video about birds as an example of what “good” video making looks like and encourages students to use a variety of shots so that their finished product looks “more professional.” As an immediate task, she asks the students to start working in groups and use the script which they wrote the day before as a guideline for building a storyboard. Once the storyboard is completed, Tara argues, the groups can use it to start selecting images and build the movie timeline on the iPad. The image below depicts the script used by the students in my focal group.
Figure 4.2 The focus group's script

On a two-sided paper, provided by Tara, there are 8 empty squares and 8 lined spaces. This is the storyboard. The students are asked to provide a description next to each of the squares and to draw an image next to the text. Without other explanation, Tara hands out the students their script, and the storyboard, seen below.
Figure 4.3 Scan of the focus group’s storyboard. Page 1.
The students are asked to work as a group to create a storyboard and then to select pictures and videos. However, as I will point out in the following pages, the storyboard scripting and image/video retrieval happens simultaneously and not in the
order that was envisioned by the instructor: first work on the storyboard, then move on to selecting images and videos. The students were told that each group’s storyboard will be evaluated by either the video instructor or by one of the two teachers. Only after the group’s storyboard is completed, they will be allowed to work on the iPads and compose their movie. In this respect, both the script and the storyboard act as material gatekeepers, or material OPPs in the creation of a digital product. If the students do not have a storyboard by the end of Day 1, they will not be allowed to start creating a movie on Day 2. The beginning of the project is framed around a successful navigation of both a digital OPP (the iPad) and two paper OPPs (the script and the storyboard). The students are expected to collaborate, take turns and switch roles and have equal access to all three OPPs. Ideally, the group participation would have looked like this: the students exchanging ideas and contributing to the production of the storyboard and to the selection of images and videos.

![Figure 4.5 Obligatory Passage Points](image)

In the image above, the full dots represent the students, whereas the three signs represent the material OPPs (the iPad and the two pieces of paper, the script and the storyboard).

As the students start working with their respective groups, Mark, a student who struggles with reading and writing, but whose mastery of the iPad and other electronic devices (the projector) is, based on my observations, more advanced than that of his peers, grabs the iPad. He and another boy in the group, Harrison, push two desks together. Mark, still holding the iPad, takes a seat at the end of the desk. Harrison grabs the script and the blank storyboard from Tara, sits down next to Mark, and pushes both the script and the storyboard to his right. As soon as, Carrie, the other member of the “Coyote” group joins them, the boys tell her that she is going work alone transcribing the
script onto the storyboard. Carrie agrees. As soon as she begins to fill out the empty spaces on the storyboard, the boys turn their attention towards the iPad. They start going through the “Pictures” app, selecting images and videos from the iPad’s library without paying any attention to what Carrie is doing.

Figure 4.6 (from left to right) Mark and Harrison selecting images; Carrie working on the storyboard

In the image above, we see Carrie hunched over the storyboard, engaged in paper-based literacy, while Mark and Harrison (in the middle) are working on the iPad. The following episode is representative of how the interplay between the physical (storyboard and script) and the virtual (the iMovie’s timeline and GarageBand) Obligatory Passage Points challenges the students to employ performance epistemology (using strategies that were not taught in classroom). In the image, we see Mark holding the material OPP (the iPad). He touches the screen to gain access to the iPad’s image gallery and engages in an activity that he is comfortable with: selecting, resizing and sorting images. Because, as we will find out later, Mark has difficulty reading and paper-based literacy does not appeal to him, he is more than happy to “recruit” Harrison to become his aide in engaging with the iPad. Together, the boys will utilize the device in ways that were not taught in classroom (as a text-to-speech device) and will be the main architects of the video composition process. For the moment, Carrie is relegated to handling two of the OPPs (the script and the storyboard), that Harrison and Mark do not seem (at least for the moment) interested in. As the boys encourage Carrie to work on
creating a storyboard, Carrie finds herself responsible for handling the OPPs which will become, as I will show in the following interaction, most prone to critique and annotation from the teacher.

4.3. Analysis

The interaction between the boys seems civil and they take turns in handling the iPad. Mark holds the iPad horizontally with his left hand, while Harrison holds it at the other end with his right. This is the first insight into how collaborative practices pan out in the digital realm. The boys are holding the material object, the material OPP, the iPad. However, to use the iPad, the boys need to touch the screen. Only after they touch it with their fingers, do they have access to the virtual OPP, in this case the iPad’s picture and video gallery. However, it quickly becomes obvious that touching the screen simultaneously does not work because the iPad’s interface responds to only ONE touch at the time. In the light of this difficulty, Harrison comes up with the solution: to place the physical object flat on the desk so that both boys have a better angle of view and, therefore can take turns using the device. When one of the boys seems to be using the iPad for too long, the other simply pushes his hand away. For the time being, the action of removing access to the screen does not cause significant distress. The other player “gets it”: his time to use the iPad is up. Still, there are other issues that come with positioning the iPad flat on the table: the glare and the iPad’s inability to automatically adjust the screen luminosity to various angles, frustrates the students. They do not seem able to find a collaborative solution to fix that issue other than moving their heads or squinting. While Carrie is not directly involved (at this stage) in handling the iPad, she glances from time to time to see what the boys are doing and engages in conversation with them, correcting Mark when he erroneously claims that Dana (another student in their group) did not take a certain picture. However, the boys do not initiate engagement with her or glance at the script and storyboard.
While Mark and Harrison continue to browse through the iPad’s photo album, Carrie painstakingly tries to condense the narration into the tiny eight sequences on the storyboard. She pauses, rubs her forehead, sighs, looks at the script, then at the storyboard, frowns and takes quite a while to fill out the first two sections of the storyboard. She seems lost and frustrated. More importantly, if we look at what she is actually writing, we notice a discrepancy between the script and the storyboard: Carrie has shifted the order on the storyboard.

While the first sentence of the script reads

![How we respect plants and animals in City Park](image)

Do you know what City Park holds inside of it? Today we are gonna tell you how to protect City Park and respect it.

Carrie’s first box on the storyboard reads: “We protect City Park to make it better and to make it peaceful for every organism”
However, “We protect City Park to make it better and to make it peaceful for every organism” is actually not the first, but a line in the third paragraph of the script. What we are starting to see here is a departure from the script and a take up on performance epistemology. Carrie does not simply copy information from the script on the storyboard, but decides to reorder it.

At this moment, Ms. Peterson, one of the teachers, approaches the desk, takes a seat next to Carrie and glances at the two pieces of paper. Carrie continues to write while Mrs. Peterson is watching her for a few seconds. Harrison and Mark notice Mrs. Peterson’s presence. Mark gets up and moves closer to Ms. Peterson. He is holding the iPad. What follows is a transcript of the dialogue between Mrs. Peterson and the three students:

Mrs. Peterson *(looking at Mark and Harrison and pointing at the storyboard)*: Is this narration?

Mark *(hesitating)*: Ummm... dialogue

Harrison *(puzzled and frowning, looks at Mark and repeats Mrs. Peterson’s question)*: Is this narration or dialogue?

Mark does not reply and looks at the iPad. Mrs. Peterson continues to compare the storyboard to the script.

Mrs. Peterson *(reading from the script)*: We need to make this better for every organism, is that narration or dialogue? If you videotape somebody actually saying it...

Carrie *(confidently)*: This is narration!

Mrs. Peterson: Narration, ok *(pointing at the storyboard, but not looking at the iPad)*: And do you have any other sound?
The students do not respond, and continue to look at Mrs. Peterson. Mrs. Peterson points at the storyboard.

Mrs. Peterson: This is a column here [indicates the first segment of the storyboard], do you want any other sound here?

The students follow Mrs. Peterson’s hand as it moves from the storyboard to the script and vice versa. She turns and points at the board where Tara left instructions on how to create a linear, chronological timeline.

Figure 4.10 The students are looking at the board

Mrs. Peterson turns around and focuses her attention back on the script and the storyline.

Mrs. Peterson (points at one column on the paper storyboard): This is the video and pictures!

Mrs. Peterson (points at another column on the paper storyboard): This is the sound!

The students follow Mrs. Peterson’s hand, and listen in silence.
As we see from this exchange, a human OPP (one of the teachers who is supposed to supervise the students and keep them ‘on the right track’) sits down for a brief exchange just as Carrie showed signs of frustration and the two boys were ignoring her. While Tara indicated that the script was the springboard for the storyboard, meaning that the script was OPP 1 and the storyboard was OPP 2, Mrs. Peterson does not seem to follow the video instructor’s recommendation *ad litteram*. I noticed that her glance is directed mostly at the storyboard, bypassing the linearity of the “script and then storyboard” indicated by the video instructor. As she focuses directly on the storyboard, the teacher reverses or disturbs the order that was previously presented to the students, which seems to confuse the three children.
There is no way of telling whether this reversal or blurring between the two paper-based OPPs stems from a disagreement with the video instructor’s presentation, is a sign of the teacher herself being confused, or of her perception that the students have issues only with the storyboard. Mrs. Peterson’s first question refers to whether the first written vignette in the storyboard is narration or dialogue. After she receives the expected answer from Carrie, “narration,” the teacher moves on to ask the students whether or not they have sounds to support the narration, which is a good indication of her recognizing the importance of modal variation in the video making process. However, the material OPP, (the script), was not designed to accommodate a space for “sound,” and has only lines for “writing” and a square where the students are expected to draw an image that refers to the visuals accompanying the text. I will elaborate more on the confusion created by the pictorial square in the following pages. When Mrs. Peterson asks, pointing at the storyboard, “This is a column here, do you want any other sound here?” the students do not reply. Tara did not mention that the students should include sounds in their storyboard. Mrs. Peterson proceeds to then gesture that the information from the script should be reflected in the storyboard, a first indication of the connections between the two OPPs. After she reminds the students that they need to be mindful of
the linear outline presented on the board by the video instructor, Mrs. Peterson voices her concern: “I don’t think you guys you are setting your scenes. What is your theme?” Before answering, Mark reaches for the digital OPP (the iPad), while Harrison grabs the paper-based OPP (the script). As Harrison is trying to use the paper OPP as a prop to support his assertion that the theme of their project is “protecting animals”, the teacher exercises her propositional knowledge to tell Harrison that she does not want to read the script, indicating that she would rather want to hear from him. As she continues to press the matter of including sound in their documentary, Mrs. Peterson manages to get the students engaged into thinking about sound and ambient noises and to provide examples that could possibly benefit the project. However, when Mark tries to engage with the digital OPP, the iPad, as a platform for examples of sounds they have already recorded, Mrs. Peterson forcibly removes the device from his hands.

![Image](image.png)

**Figure 4.13 Mrs. Peterson removing the iPad from Mark’s hands**

The action which will be repeated, although not as forcibly by the other teacher is illustrative of how the instructors perceive the digital OPP as a step in the video composition process, but a step that cannot precede the paper-based OPPs (the script and the storyboard).

After Mrs. Peterson leaves, the students engage in performance epistemology (working in the absence of any classroom instruction) to respond to the challenges presented by Mrs. Peterson’s propositional epistemological instruction. Identifying
whether a text is narration or dialogue, as Mrs. Peterson suggested, does not seem to help the students fill in the “drawing” rectangles in the storyboard. Mark grabs the iPad, and, with a couple of clicks, opens the “Notes” app where the group had originally saved their script. Mark touches the screen, highlights the entire text, (an action that was not taught in class), looks at me and asks:

Mark *(pointing at the iPad)*: Hey, can we do this? Can we go on Notes so we can just read it?

Me: Yes.

Harrison watches Mark closely as he highlights the text and turns the iPad vertically, as if holding a book. Meanwhile, Carrie continues to work alone on the two paper OPPs, trying to condense the script into the storyboard. While Carrie has access to the paper-based script, the boys exercise their performance epistemology and make the iPad “read” the script for them. A much faster way of engaging with the text for Mark, who, as we will learn later, struggles with reading and writing, the activation of the iPad’s “text-to-speech” feature allows him to feel that he can keep up with the others in terms of reading, while, at the same time showcasing his technical skills.

Harrison *(looking at the highlighted text on the screen)*: Let’s make it speak!

Mark *(accessing the iPad’s settings and the embedded text-to-speech capabilities)*: Okkk, we’re lazy so we’re going to make it speak.

Mark seems very much at ease finding the settings and activating the text to speech feature on the iPad using only a couple of clicks. Meanwhile, Harrison watches him closely.
As soon as Mark activates the ‘text to speech’ feature on the iPad, the boys look at the highlighted text and listen, briefly, to the text being read for them.

Mark (looking at Harrison and laughing while the automatic voice embedded in the iPad reads the text to them): We’re so lazy!

Harrison (laughing and pointing at the screen as Mark is trying to select the rest of the text): Double tap
Figure 4.15 Mark highlighting the text

The iPad starts to “read” the highlighted text for them and the two boys listen in silence. Unfortunately, shortly after this operation is initiated, the bell rings and the boys put down the iPad and rush to the door. After recess, they try to resume working with the text-to-speech feature, but Tara asks the students to stop whatever they were doing and pay attention to the board. Tara addresses the class reminding them again about the importance of segmenting their work in stages which cannot be undone (deleted) or skipped and stresses the linearity of the editing process. Harrison seems to be the most receptive to Tara’s suggestions, listening attentively, while Carrie works on the storyboard. On a couple of occasions, she raises her head and looks at Tara. Mark, on the other hand, shows very little interest in what Tara is saying and continues to glance at the iPad, even after the students were told to disengage with the device and place it face down on the desk. Tara reminds the students that they need to complete the storyboard by the end of the day.

When they regroup after Tara’s speech, Carrie resumes her transcribing duties from script to storyboard (from OPP1 to OPP2) and the boys try, again, to access the iPad’s text-to-speech feature. However, they are interrupted by Mrs. Warren, the other teacher who sits down with the group. Mrs. Warren looks at Carrie’s storyboard and pushes it towards the middle of the table so that all three students can see it. Mark and Harrison stop working on the iPad and look at the storyboard.
Mrs. Warren (*pointing at the storyboard*): So, have a look and see what you have got for your first two sentences. You guys need to find pictures to go with your two first sentences, right?

Harrison (*holding the storyboard and nodding*): Right!

**Figure 4.16 Mrs. Warren pointing at the storyboard**

Harrison (*looking at Mark and pointing at the first two squares on the storyboard*): What about these here? These here?

Mark (*holding the iPad and glancing at the storyboard*): No, we could...

Harrison (*holding the storyboard and continuing to point at the empty squares*): Which one do we want for these here?

**Figure 4.17 Mark and Harrison looking at the storyboard**
Mark *(holding the iPad, and reading from the storyboard)*: We...*(hesitates)*...what does it say?

Harrison *(in a supportive tone)*: Respect and protect...

Mrs. Warren *(interrupting)*: So guys, while she [referring to Carrie] is sharpening her pencil, maybe you wanna draw a little sketch of the first picture?

Mark is not paying attention, he is already shuffling through the iPad’s picture gallery.

Mrs. Warren *(pointing at the empty square on the storyboard)*: You are probably going to have a lot more than one picture.

![Figure 4.18 Mrs. Warren showing the students where to draw](image)

Mark *(keeps browsing for pictures on the iPad)*: Harrison is really good at drawing!

Mrs. Warren *(in a stern voice)*: Mark, just listen! You’re gonna have more than one picture for each one. You may have four of five pictures.

Mark *(surprised)*: In a box?

Mrs. Warren: Yes, you may have four or five pictures of a video clip in there.

Mark *(grabs a pen and tries to replicate an image he has opened on the iPad)*: So, can I just sketch it? It doesn’t matter, right?

Mrs. Warren: You’d better let Harrison do it, that is his specialty. You are better at the tech.

Mark: Carrie does writing, Harrison does drawing, I do iPad [inaudible]

Harrison *(grabs the storyboard and the pen)*: What do I draw?
Mark shows Harrison the image on the iPad and he starts to sketch it as Mrs. Warren leaves.

![Image of students working on a project]

**Figure 4.19 Mrs. Warren looking on as Mark and Harrison collaborate on drawing**

The exchange between the group and the second teacher reveals a similar dynamic as their previous exchange with Mrs. Peterson. As the linear progression, between Script (OPP1) -----> Storyboard (OPP2) is encouraged by the teachers' presence and input, the connection between the two and the necessity of having a storyboard in addition to a chronological script are not fully explained to the students. Moreover, the iPad's position as a semiotic resource (the device where they store video and images), adds a layer of complexity and difficulty to the construction of the storyboard. Based on my observations, and on the discussions between the students, we can infer that the three students understand their script. Mark confides in me that he “knows the script by heart” so that he doesn’t need to read it multiple times. The script is rather straightforward: it is a narrative broken down in paragraphs, which the students have written together and have, based on my observations, read multiple times either on paper or, as I have shown above, on the iPad. However, transferring the written information of the script (OPP1) to the storyboard (OPP2) that invites both a written and an image (drawing) component, confuses the students and, as we have seen, even the teachers. Mrs. Peterson insists that the students focus solely on the two paper-based OPPs and points out that the script is the main source for producing the storyboard. When Mark tries to reach for the digital device, she removes it from his hands. It is not
until Mrs. Warren checks on them, that the students begin to realize that the storyboard’s squares could accommodate more than one image. As the process of building the storyboard unfolds, it becomes obvious that the students would be more comfortable to just skip the storyboard altogether and build their iPad movie timeline around the script. As seen in the above-mentioned exchange, the students struggle with the linearity of the CDS model. However, Mrs. Warren scaffolds the movie composing process by pointing out that the rigid “one square-4 lines for text” per segment, acts as a guideline. She corrects the students’ erroneous perception that Mrs. Peterson encouraged them to use “one square equals one image.” In this respect, as the human OPP who sanctions what “counts” as valuable for the movie, Mrs. Warren also exercises her authority (propositional epistemology) to override the other teacher’s recommendations and to delegate tasks to specific students: Mrs. Warren thinks that Mark is good at tech and Harrison is better at drawing. The distribution of tasks can be stemming from Mrs. Warren’s awareness that the students need to speed up the completion of the storyboard: as the human OPP who exercises her propositional epistemology, Mrs. Warren decides on the spot who has access to the digital device (Mark) and who should be drawing (Harrison). She bases these decisions on her perception of the students’ competence and not on the need to equal access to the device. This decision was primarily strategic: time, after all, is essential when the group has three days to put together their movie. But, by sanctioning the positions in the group as static (Mark is the tech person, Harrison draws and Carrie writes), Mrs. Warren, inadvertently, encourages the students to challenge their roles and to take a more prominent position in the process of video making. Relegated as the “writer” of the group, Carrie, as I will show in the following dialogue, starts to speak up. Her role in the project will be even more important during day two of video composition.

As soon as Mrs. Warren leaves, Mark grabs hold of the iPad and starts shuffling through the “Pictures” application and opens the iMovie app (a step that was not supposed to happen until the following day). Harrison watches him closely and Carrie continues to write. For a short period of time, the students seemed “locked” in the positions assigned by Mrs. Warren (the human OPP). However, as Mark continues to shuffle through the images and play around with iMovie, Carrie stops working on the storyboard and looks at the boys.

Carrie (in a happy, elevated tone): I know what we should do!
Harrison: What?
Carrie: Put a picture of a dead bat
Harrison (approving enthusiastically): Oh yeah!!
Harrison: Or an owl...
Carrie: No, the dead bat
Harrison: Ok, dead bat. (He looks at Mark who is playing on the iPad): Dude, what are you doing?
Mark (not giving up the iPad while playing around with iMovie): I make a movie
Harrison (tries to take the iPad, but Mark won’t share): Dude we need the photo, can I draw? (tries to grab the iPad)
Mark (does not let go): I need it, photo albums, um...(Harrison makes another unsuccessful attempt at grabbing the iPad, but fails)
Harrison (disappointed, frowning): Awwwww...
Mark (continues to work on the iPad): I’m making a movie!
Carrie gives Harrison the storyboard and he starts drawing the bat in one of the squares. The conflict is resolved: Harrison seems to have forgotten about Mark denying him access to the iPad, and he is now preoccupied with drawing a bat.
Harrison: Ok, ok, I don’t have a picture of a bat, I can draw a bat!
Mark: Ok, Harrison has to draw a bat.
Carrie’s intervention signals the beginning of her involvement with the moviemaking process by bringing to the fore her ability to multitask (write/read and follow the digital video composition process), which she will use in the second day of video composition. The episode is relevant for two reasons: it shows that Mark bypasses the linearity of the video composition on the digital device (he no longer looks for pictures, but jumps ahead and starts playing with iMovie, although neither the video instructor or the teachers indicated that it was the next step) and it shows that although the students do not have an image of a dead bat on their iPad, they understand that the correlation between text and images in the storyboard can be used metaphorically. If they do not have an image on the device, they can imply, as a reminder, for when they
construct the timeline that some “dead animals” in the park are victims of human negligence: they ingest garbage.

Figure 4.20 Screenshot of the storyboard depicting the drawing (dead bat) along with the accompanying text

As Harrison draws the dead bat next to the “let’s not litter text” he proposes that, in the iMovie timeline, the dead bat image should be replaced with an educational video: one of students throws garbage on the grass and another student picks it up and puts it in the bin.

Harrison *(interrupts Carrie and points to his chest)*: Animals can die because of the choking and we can show that on the other page, the video part. *(He taps Carrie’s shoulder and shows her what he wrote)*: ‘Video of Mark picking up litter.’

Figure 4.21 Carrie pointing at the storyboard
At this point, Mark, who has remained focused on exploring the iMovie’s timeline instead of looking for images, notices that Carrie and Harrison need help. Although he seems completely absorbed in his work, Mark proves that he is still listening to his teammates. He understands that Carrie and Harrison may be looking for some videos or images that depict garbage in the park. Mark switches from iMovie to the “Images” app and starts looking for visual aids.

Mark: We have some videos, so go, go, go!

Harrison (shows Mark both sides of the storyboard): Ummm...don’t you wanna put something related to this picture (shows him one side of the storyboard) here? (shows him the other side of the page indicating a different location)

Figure 4.22 Harrison pointing at the script

This exchange is particularly important because it shows that the students were not only able to understand the connection between the two paper OPPs, namely that the script can be ‘transferred’ onto a storyboard, but also shows a visual and a metaphorical engagement with the script. Harrison and Carrie know that they may not have a picture of a dead bat, but that animals die due to human negligence: they ingest garbage. In this respect, Harrison’s drawing condenses, or “blackboxes” in ANT parlance, an entire video that cannot be represented on paper. Moreover, even though
Mark cannot find a picture or video of a dead animal, the episode is representative for a third reason: it shows that Harrison is willing to break with the linear convention of storyboarding and place an image/video in another slot on the paper. Moreover, as we will see in Day 2, the students remember that they do not have visual aids to support their “dead animal” claim, so they will engage in performance epistemology to fill that gap in their storyline. I will discuss that in the next chapter.

At this stage in the storyboarding process when Harrison and Carrie continue to try and finish the storyboard, Mrs. Peterson returns to check in on the students. Once again, the teacher’s propositional mode, is displayed in full force. Mrs. Peterson sits down, looks at the storyboard, lifts her head and looks at the students silently. Mark, who is still holding the iPad informs her that they are looking at a video of the First Nations woman who told them about the importance of medicinal plants. He implies that they will use the video in their project.

Mrs. Peterson: Do you have a video of her saying it? [she is referring to the video of the First Nations woman]

Harrison (picks up the iPad and starts flipping through it): Yeah, yeah…we do...

Mrs. Peterson: Then you should tell your script writer here (points at Carrie) to find the video, you don’t have to describe it right now [a lot of background noise], this is going well...

Harrison (puts the iPad down and grabs it right back): “Let me see”.

Carrie lifts the script and shows it to Mark.

Mark (reads slowly): Your heart is red...

Mrs. Peterson (interrupting Mark): But Carrie, you guys, (she raises her voice): just STOP, STOP, STOP... just wait... are you going to have Clarice [she mispronounces the name of the park guide] saying this stuff?

Mark: We’re gonna have this video from here... (points at the iPad) to there... (points at the storyboard)
Mrs. Peterson (grabs the iPad and raises her voice): Mark!!! Everybody STOP! This script is more pictures... this video... you will write Clarice... (points at the script).

The kids look confused, but do not ask further questions.

Mrs. Peterson (pointing at the script): So, you need to put video here, video and then put sound, picture (She gets up and leaves).

As Mrs. Peterson sits down with the group, she indicates that Carrie should be more involved in searching for videos and images, rather than being relegated to the "script writer" position, which is in direct contradiction to what Mrs. Warren told the group. Moreover, Mrs. Peterson clearly confuses the students when she interrupts Mark’s explanation of how they are considering including a lengthy video of the First Nations woman in their script. Mark attempts to explain before being interrupted, that they understand that the video is part of the storyboard, but they cannot draw the video on paper. When Mrs. Peterson interrupts him, she uses her authority as the human OPP (i.e., the teacher), to redirect the discussion to the material OPP (i.e., the script) without giving the students the chance to explain themselves. The children’s confusion is fueled also by the fact that Mrs. Peterson tells them to put videos, images and sounds on the paper, namely on the script. However, the entire day, the students had used the script solely as a reference point to build up the storyboard which is envisioned as the main paper-based OPP (starting point) for their movie. The fact that Mrs. Peterson grabs hold
of the script baffles them (judging from their facial expressions), but they do not ask her for clarification. Instead, as soon as she leaves, the group returns to the same working dynamic as before: Carrie continues to transcribe bits from the script onto the storyboard, while Mark selects videos and pictures on the iPad and saves them in a special directory. He does not glance at the storyboard or the script, but consults with Harrison over which videos and pictures make the cut. When Tara announces that they have about 30 minutes left, Mark glances at Carrie who is still trying to finish the storyboard. Suddenly, Mark exits the “Picture” application by pressing the iPad’s main control button and opens the “Timer” application on the device. He immediately challenges Harrison and Carrie to complete the storyboard by playing a game: who of the two can beat each other’s time at drawing on the storyboard. Since by now Carrie had finished filling in the 8 spaces of text, all that is left to do is to finish drawing 4 more images. Both Harrison and Carrie agree to play. With Mark timing each student on the iPad, Carrie and Harrison each complete two drawings in as Mark puts it “very good time.” The second OPP, the storyboard, is completed.

Figure 4.24 Mark timing the students using the iPad

As the day draws to the end, this last episode reveals the students’ diligence in finishing up the task of the day. Since all three adults (the teachers and the video instructor) were adamant that completing a linear, paper-based storyboard is the cornerstone of the movie, each student worked hard to ensure that it was finished by the end of Day 1: Carrie had to tackle the complex task of writing the eight sequences that would be used to create the timeline on the iPad on the following day. She was aided by
Harrison, who drew some of the pictures. Mark, successfully repurposed the iPad as a text-to-speech device when his reading problems appeared to slow the group down. He also turned the iPad into a timer to motivate, challenge and keep his teammates entertained. With the iPad repurposed as a timer, Carrie and Harrison completed the storyboard relatively quickly. The students laughed, compared the times they needed to fill in the last squares of the storyboard and looked content with the finished product. While no adult came to check on the group (they finished right before the bell rang), the students seemed pleased. They managed to clear the second obstacle in finishing their movie. On the previous day, they had to finish the script. On this day, despite conflicting advice coming from the teachers, they completed their storyboard.

4.4. Conclusion

Despite the rather vague explanations that the students received from the teachers, who, at times, used verbal and physical force to draw the students’ attention away from the digital device back to the paper script and storyboard, the students’ employment of performance epistemology managed to counterbalance the prevalence of the rigid and confusingly-presented linear process of movie making. In this respect, Day 1 of video editing was marked by a more prevalent presence of physical (human and non-human) OPPs: a) the teachers (who checked on the group, offering help, but other times confused the students); b) the script vs the storyboard, which really challenged the children to envision how their movie looked on paper, but constrained them with a rigid number of images and text and c) the iPad, which at this stage in video composition was used either as a storage device for images and videos, as a text-to-speech device and as a timer to enhance competitiveness and to make the process of storyboard writing more efficient and fun.

All in all, it would be unfair to imply that all these three physical OPPs held similar weight during this day of editing. In the chaotic, fast-paced, overlapping events that shaped this day, each of these OPPs became more prevalent for a fleeting moment before fading in the background as another OPP took center stage. This dynamic, unpredictable network of humans and non-humans combined “old timers:” pen and paper, script and storyboard and their inherent linearity, sequence and order, with the “new technology:” the iPad capable of versatile actions and of engaging the students’
proclivity for performance epistemology. As the reader will see in the next chapter, Day 2 brings different and more complex challenges.
Chapter 5.

Day 2 Video Composition: From Storyboard to iMovie - Competing Obligatory Passage Points

5.1. Overview

On the morning of the second day of video composition, Tara tells the students that they will head to City Park for an hour to take more pictures, videos and make audio recordings on their iPads. Upon returning, Tara continues, the rest of the day will be spent building the movie’s timeline on the iPad’s iMovie app. As the kids are heading to the park, I notice that Harrison brings along both the storyboard and the script. He glances at them while walking. Mark, oblivious of what the others are doing, carries the iPad and keeps turning it on and off. Carrie walks quietly next to them. As soon as they get to the park, Mark, Harrison and Carrie separate from the rest of their classmates and find a quiet spot. They sit on a tree stump. Without saying a word, Mark places the iPad on his lap, turns it on while Harrison and Carrie watch him in silence. Harrison grabs an external microphone from Mark’s backpack and connects it to the iPad. Mark taps the screen and opens GarageBand (an application designed exclusively for recording, sound editing and sound exporting). A couple of days before they started composing their movies, the students received a formal 20-minute instruction on how to use iMovie, but they were never taught anything about GarageBand, except that it records sounds and that it is a useful app for recording voiceovers. However, Mark seems quite at ease navigating both iMovie and GarageBand, because as he later confessed during our exit interview, he was somewhat familiar with them thanks to a friend who had an iPad.

As soon as he connects the microphone and turns it on, Harrison moves away from Mark, allowing enough space for Carrie to sit between them.
They sit in silence for a few minutes, paying attention to their surroundings and listening to the sounds of nature. Harrison lifts the external microphone, places the script and the storyboard next to him, glances at Mark and nods: he is ready to start recording. Mark nods back, presses the big, red, “Record” button on GarageBand. The students wait in silence. Suddenly, some birds start chirping. Harrison presses his index finger against his lips, as if making sure that neither his teammates, nor I who I am filming, are going to disturb the recording. As the sound of the birds chirping intensifies, Harrison cannot contain his excitement. He makes a fist and mouths a “yes” while still holding the microphone. He seems very content: on the way to City Park, Harrison confessed to me that he was hoping to record “the best sounds.”
Figure 5.2 Harrison seems quite pleased

Mark waits a couple of minutes, then presses the “Stop” button, and Harrison disconnects the microphone. The boys do not check the quality of the recording. Mark saves the it in GarageBand, hands over the iPad to Harrison and Carrie. Carrie grabs the iPad and takes a few photos and records a video of Harrison throwing garbage in a bin. Without waiting for the rest of the classmates, the group insists that I accompany them back to school: “We have a lot of work to do,” says Harrison.

The short visit to the park is relevant, because it depicts the first of the many instances when the iPad is used as a material semiotic resource, namely as a device that captures a mode (sound) which will be enhancing the movie. This episode also illustrates a recursive engagement with the iPad: the children re-visit the park and re-take videos and images that will replace the ones they already have. Third, the episode is relevant in terms of collaborative engagement: despite the iPad’s versatility, a single person would have found it difficult to hold the microphone still, start the recording app, pay attention to the ambient sounds while following certain steps (the microphone had to be attached to the iPad before starting the recording, the app had to be opened before pressing the ‘record’ button, and so on). In this respect, Day 2 starts out quite promisingly: in less than one hour, the iPad is used as a recording device and as a video
camera, setting the stage for what some researchers have called “multimodal orchestration” (Kress, 2010), “modal configuration” (Norris, 2009) or “modal layering” (Walsh & Simpson, 2014). Multimodal orchestration is a sensibility that dictates what mode is deemed dominant over others and, as Kress (2010) has pointed out, it is a unique perspective which differs from person to person. Reaching a consensus on how the modes should be orchestrated will not be easy for Carrie, Mark and Harrison, but thanks to the iPad’s versatility, the students used the entire second day of video composition experimenting with various modes and engaging with them, as Fulwiler and Middleton noted, recursively. More importantly, the visit to the park is an example of performance epistemology in action: despite not receiving in-depth instruction on how to use a key app of their composition process, GarageBand, Mark resorted to his out-of-school knowledge when he used GarageBand to record ambient sounds. He seemed so confident in his skills, that he never replayed the recording.

5.2. The Narrative

Back in the classroom, Tara returns to the propositional mode of instruction: the students are asked to sit down and to put their iPads away. She asks a lot of questions about the students’ visit to the park, but discourages them from asking questions invoking time constraints. At this point, the students have almost a day and a half left to assemble their movie and put the final touches on their project. Tara explains the students how they should build their timeline: She reminds them that they should use their images in order, and that they should use their GarageBand recordings. The students follow her attentively.

Tara: Right now, you just get your shots and your pictures in order and start to see like a visual story come together. Does that make sense? Ok, we’ll be going to each group, but remember get them all in order first.
While Tara’s recommendation continues to follow a linear logic (i.e. using the eight episodes in the storyboard and adding them to the timeline in the order in which they were written), when left to their own devices, the students engage in a different digital compositional practice. In Chapter 2, I discussed how Compositing and Recursivity focus on the process of cognitive wrestling in relation to how certain modes (visual and audio) are going to be prioritized, despite the existence of a paper-based script and storyboard. In a nutshell, I argued that observing video composition through the lenses of Compositing and Recursivity, helps us understand the processes though which students sort, select, delete and alter their data.

Since both Compositing and Recursivity are rather unfamiliar concepts in digital literacy studies, I will briefly revisit the them here: according to Fulwiler and Middleton (2012), Compositing is concerned with prioritizing modes and their shifting meanings. In this respect, video composition consists of linking a series of Composites (segments which blend together video footage and a corresponding sound recording). On the other hand, Recursivity is not just a simple process of revisiting footage. The use of a digitally versatile technology such as the iPad, implies that each process of revisiting a movie is an opportunity to shift around composites, alter meanings or create new ones. It is not a process that takes place at the end of video production as it is the case in traditional video editing, but rather throughout the video-making since the iPad affords much more
freedom to rewind, add, delete or reposition a video without too much effort. In this respect, Compositing and Recursivity recognize the dynamic nature of video composition, something that the students I observed displayed instinctively despite constant reminders from the instructors that sticking to the storyboard was a better way of creating a coherent, comprehensible video product.

In describing the painstaking process of how the students put together a movie using a single device—the iPad—that blackboxed many other attributes (video recorder, camera, voice recorder, sound mixer and exporter, video timeline builder and reading and searching device), Day 2 focuses on how the paper-based semiotic resources (the script and the storyboard) are used by the students in conjunction with the digital device (the iPad). While two of the students (Carrie and Mark) operate almost exclusively on the principles of compositing without consulting the storyboard, Harrison alternates between a digital, non-linear way of building a movie and a paper-based, script-based way of creating a film. Day 2 sees a series of complex collaborative activities among the students where the Day 1 dominant OPPs (the storyboard and the script) lose terrain to the digital OPP (the iPad), but never actually leave the stage.

5.3. Analysis

After Tara’s brief reminder of how to proceed with putting together the video in a linear fashion (start with the first scene from the storyboard and finish the video with the last scene from the storyboard), Carrie, Harrison and Mark move to a table at the far end of the room. This is a busy day: according to the schedule, by the end of the day, they need to have the entire timeline assembled (the videos and images “orchestrated” [Kress, 2010] and their voiceover recordings saved in GarageBand). The three students waste no time: Mark grabs the iPad, and takes a seat next to Harrison. Because of the way the table is positioned, the students sit next to each other (Harrison in the middle, Carrie to his left and Mark to his right). As soon as they are seated, Mrs. Peterson brings over a monitor, plugs it in and connects it to the iPad. The students watch her in silence. Harrison places the storyboard and the script to the right of the monitor. For the moment, none of them are looking at the paper material that took so much effort to produce. The students huddle around the new dominant OPP (the iPad) and leave, for the moment, the other OPPs (the storyboard and the script) to the side. Watched closely by Carrie and Mark, Harrison touches the iMovie icon and opens the application. Without looking
at the paper, Harrison touches the upper right side of the screen (where the video and image library are located) and imports two videos:

- one video depicts him at the entrance to the park picking up a piece of paper and placing it in a bin

- the second is showing a group of students walking towards the park.

Interestingly, as seen below, this import is marked as the fourth and not the first sequence on their storyboard.

![Storyboard Screenshot](image)

**Figure 5.4 Screenshot of the storyboard, depicting a “4” next to it.**

The fourth scene in the storyboard, becomes, at least for the moment, the first scene on the students’ timeline. Sadly, I do not have a separate image of the first scene, but for the reader’s visual reference, I blurred out the additional scenes that were added afterwards. The image below depicts what, at one point, was the very first scene the students had on their iMovie timeline.
The import is relevant because, as soon as Harrison adds it to the timeline, Mark who is watching him closely, interjects: he wants the order of the two scenes reversed. He wants the “Harrison picking up litter” second and the clip of the students walking to the park first. A dispute between the two students ensues:

**Mark:** But we need something for talking [he may be referring to the need for a voiceover recording] Can I show you something? Sorry. *(Looking at Harrison)* Do you mind if I show you something?

**Harrison** *(does not respond and looks at the iPad)*: Maybe if we take this...can you? *(he points at something on the timeline, but Carrie moves into the frame of my camera).*

**Mark:** Maybe we can delete this [he is referring to the clip depicting the kids walking towards the park].

**Harrison** *(alarmed)*: OMG, are you deleting?

**Mark** *(doesn’t give up, and deletes the first clip which shows the children walking)*: Let me show you something....

**Harrison** *(alarmed)*: OMG, are you deleting?
Mark (*in a soothing voice*): I just wanna try something. (*He is flipping through the iMovie library*): Where was that? That one...[it is unclear what he is looking for]

Harrison (*alarmed*): Mark, what are you doing?

Mark keeps the video of Harrison picking up litter, but imports the video of the kids walking in the park BEFORE the one depicting Harrison.

Harrison (*frustrated*): That’s wrong, it goes into park and then it picks up the litter? [he is referring to that fact that he is confused by Mark switching the order of videos]...It goes (*emphatically*) in the park...

Mark (*ignores Harrison and continues to look at the iPad*)...and if somebody drops the litter...

Harrison (*becoming even more frustrated and continues to talk to Mark who works on the iPad*): ...and then we are back here [he points at the screen showing a discrepancy that occurs because of the videos being switched. The first video shows Harrison walking away from the trash bin and then it jumps to Harrison picking up litter and putting it in the bin]:...actually we should switch, we should switch it...

*Figure 5.6 Harrison and Mark working on the iPad discussing the order of the images.*
Harrison taps the screen, but fails to delete the segment, so Carrie grabs the iPad, selects the clip (“Harrison picking up litter”) and deletes it. For a split second, the “students walking in the park” segment is all they have on the timeline. Carrie touches the upper right corner of the screen, opens the iMovie library, scrolls down and finds a clip that seems to match the one that was just deleted. She adds it again to the timeline. The students rewind the sequence (composite) a couple of times. However, Harrison notices that something is different.

**Harrison (pointing at a picture on the timeline): Why is it just this? [He is referring to the fact that Carrie imported an image, but not the clip.]**

Carrie agrees that she may have imported a still image of Harrison, deletes the image and reimports the video. Now, the timeline looks exactly the way it was in the beginning:

- The video of Harrison walking towards the bin
- The clip of the students walking towards the park.

The episode is relevant because it shows Carrie starting to take a more creative role in the modal orchestration: she deletes the picture, reimports videos and when the iPad gets disconnected from the monitor and the boys seem to be losing patience with the cable coming loose, Carrie calmly reconnects the iPad each time this happens. As the boys struggle to engage with the digital OPP (the iPad) and its embedded (virtual) components (iMovie’s timeline), Carrie proves that she is just as competent as the boys in handling the device. Nobody has shown her how to reconnect the device to the monitor and nobody has pointed out that she should restart the monitor if the connection to the iPad is still not established. By exercising her performance epistemology (acting in absence of classroom-taught examples), Carrie establishes herself as a connective node in the group: she keeps the peace when the two boys disagree over the order of their first videos and keeps a close eye on the device each time it disconnects from the monitor.
Figure 5.7 Carrie trying to reconnect the iPad to the monitor, while Mark continues to use the iPad

After the connection is restored, Mark and Harrison push each other’s hands away: they are both eager to gain control of the iPad and to add another clip. This time, Harrison loses and Mark imports another video: “camera panning over a grassy area in the park.” The three students review the footage.

The exchanges happening in the first half hour of video composition depict a rather rocky start to modal orchestration: the students fight for access to the iPad, space at the desk (Harrison complains that Mark and Carrie are too close to him) and push their teammates’ hands away from the screen. While I cannot speculate why Harrison chooses the video of himself picking up litter as the first clip to be imported to the timeline, the exchange between him and Mark shows that the movie is being painstakingly “stitched” together through two or three modes (videos and images) clustered together in a composite. The students engage in either modifying the components or the composite (trimming a video) or in reordering them as we have seen above. Deciding which mode is prioritized (image or video), which one stays, and which one is deleted, remains always open for debate and depends on who gains access to the screen.

However, the choice of shifting the two clips and the eventual replacement of one of them with a seemingly unrelated video, shows that the students are willing to
experiment, at least in the beginning, with modal combinations independent of the script and the storyboard (which were never consulted during this exchange). Moreover, deciding on one modal orchestration over another, i.e. one composite over another, shows the students’ concern with a certain visual logic, that did not seem to preoccupy them the previous day. On Day 1 the modal combination was mimicked on a paper-based storyboard when Harrison drew images that ‘corresponded’ to the text written by Carrie. On Day 2, the modal combinations are orchestrated on the digital platform where each student tries and manages to contribute, despite fighting for access to the device. While on the paper-based OPP (the storyboard) the order of the episodes was never a subject of dispute, when orchestrating the same images and videos on the digital OPP (the iPad), the students experiment with different perspectives: Mark and Harrison disagree on the order of the episodes they imported. While the students’ visual logic starts to show signs of artistic differences, the iPad’s flexible affordances allow a quick resolve: the students can delete or orchestrate the modes into different composites without the fear that reordering or reorganizing would take an inordinate amount of time. The main OPP in composing the movie, the iPad, takes center stage. But, as seen below, in the first hour since they started compositing the timeline, the students go through no fewer than seven different versions of their movie.

- **Composite one**: 1. Video of Harrison at the entrance of City Park picking up a piece of paper and placing it in a bin
  2. Video of a group of students walking in the park

- **Composite two (order shifted)**: 1. Video of a group of students walking in the park
  2. Video of Harrison at the entrance of City Park picking up a piece of paper and placing it in a bin

- **Composite three**: Video of a group of students walking in the park

- **Composite four**: 1. Picture of Harrison
  2. Video of a group of students walking in the park

- **Composite five**: 1. Replacing “Picture of Harrison” with a trimmed “Video of Harrison at the entrance of City Park picking up a piece of paper and placing it in
2. Trimmed video of a group of students walking in the park

- **Composite six**: 1. Trimmed video of Harrison picking up litter and placing it in a bin
  2. Panning video of a blade of grass in the park.

- **Composite seven**: 1. Trimmed video of Harrison picking up litter and placing it in a bin
  2. Panning video of a blade of grass in the park.
  3. Picture of Harrison

As they continue to shift around, delete or replace these composites on the digital OPP (the iPad), Mark and Carrie get more involved in ordering the videos and images on the timeline. Harrison, on the other hand, starts to show signs of discomfort. When the group reviews their latest composite (no. 7), Harrison is clearly displeased.

Harrison (*shaking his head as he is looking at the timeline*): Now it looks way too weird.

Figure 5.8 Carrie working on the timeline, repositioning the videos under Mark and Harrison’s watchful eye.

Sensing that Harrison is unhappy, Mark gets up, and glances at one of the pieces of paper left by Harrison next to the monitor. In a surprising move for a student who did not engage with the paper-based OPPs on Day 1, Mark pushed the storyboard towards Harrison who declares emphatically: “Delete everything!” implying that he wants
the timeline empty. Without protesting, Carrie complies and now their iMovie timeline is blank. Harrison looks at the storyboard and accesses the iMovie’s library:

Mark (offering him guidance): We have to go to ‘Pictures’ [he refers to the folder where they have stored their videos and images from the park]

Figure 5.9 Mark scrolling through iMovie library

Harrison reimports the original composite.

- **Composite one**: 1. Video of Harrison at the entrance of City Park picking up a piece of paper and placing it in a bin
  2. Video of a group of students walking in the park

However, this time, Harrison starts rebuilding the timeline around the original composite while using the paper-based OPP (the storyboard) as a material scaffold. At this point in the video composition, Harrison’s role changes: he starts to rely and will continue to rely more heavily on the storyboard, while Mark and Carrie continue to work almost exclusively on the digital device, paying little attention to the paper-based, linear storyboard. However, once Harrison starts using the storyboard as a reference point, the digital OPP (the iPad) no longer holds center stage: Harrison brings to the fore the so far neglected paper-based OPP (the storyboard). The students do not disagree with
Harrison’s choice. On the other hand, Harrison supports Mark when he suggests that the group skip the linear visual orchestration suggested by the storyboard and start adding other modes (sound or voiceover recordings). At Mark’s suggestion, the group “skips ahead.” They want to record narrations on the spot, using iMovie instead of GarageBand. Despite the fact that at the beginning of Day 2, Tara told the students that they will only be allowed to record narrations at the end of the day and, preferably, in a separate room, Mark insists that the group uses iMovie for recording purposes because “it is easy.”

Mark (pushing the storyboard closer to Harrison): And then, and then, we need somebody speaking. We need somebody speaking this! [Shows the other two the storyboard while pointing at the text written by Carrie]

Figure 5.10 Mark showing Harrison and Carrie the storyboard

Harrison (incredulous, looking at the paper): What?

Mark (pointing at the paper and insisting): No, we need somebody speaking this. [He is referring to the second text written by Carrie on the storyboard]

Harrison: But we did not do it in the park [I do not understand what he is referring to here]

Mark (grabs the iPad confidently and makes sure that the connector to the monitor is not loose): So? You guys are gonna do it right now!
Harrison: I am not doing it

Carrie (grabs the iPad): I will do it

Mark presses the recording button on the iMovie’s timeline and hands over the storyboard to Carrie. They do not seem concerned with the fact that at this stage in their video production they were supposed to concentrate exclusively on building their visual timeline.

Mark (holding his finger on the button): Ready?

Carrie (holding the storyboard): Yeah

Mark (presses the button): Go!

The iMovie timeline displays a green bar and a “3, 2, 1” flashing sign, but Carrie is too impatient and does not wait for the numbers to fade away before starting her recording

Carrie (reading): We protect City Park to make it better and to make it peaceful for every organism...

Mark stops the recording and the kids huddle around the iPad and lean over and listen to the recording. The result is clearly unsatisfactory: Carrie’s voice is cut off and there is a lot of background noise.

Figure 5.11 The children listening to the recording
Harrison (unhappy): Retake, retake, retake!

Mark restarts the iMovie recorder and this time Carrie waits for the “3,2,1” signal to fade away before reading out loud.

Carrie (reading from the script): We protect City Park to make it better and to make it peaceful for every organism.

Once again, the group leans over to review the recording. The ambient noise in the classroom is overwhelming: Mrs. Peterson is trying to install monitors on the adjacent table, while a short distance away, another group working on their video is talking and laughing.

Harrison: We can’t here, there is too much noise...

Mark (raises his hand and seems to be talking to somebody in the background): We’re trying to make a...

Tara (approaches the group): Hold on, don’t record your narration yet, that’s part of the problem...it’s not the time to record the narration yet...

Mark (trying to be persuasive and pointing at the timeline and at the image and at the matching narration): But we have to!!!

Figure 5.12 Mark pointing at the timeline

Tara: You have to match it together...that’s what you’re saying?
Harrison: Yeah...

Mark: Because we did not have stuff to put it in.

Tara: Guys, give me just a second and we can see what we can find, ok? Maybe there is another room so we don’t have to do it yet, but I want you guys to put your shots in order and I will find you a room and as soon as possible we get that in place, ok?

The exchange reinforces the discrepancy I have observed throughout the video composition process with Tara insisting that the students follow specific and pre-determined steps, while the students, especially (Mark), aiming to include an audio multimodal component simultaneously with the visual component. When Tara intervenes, she enacts her propositional knowledge reminding them that they are supposed to record voiceovers at the end of the day. However, she shows willingness to accommodate the students’ needs. (While they did not get the recording room right away, the group waited for their turn until the end of the day to record and save their narrations). Meanwhile, after attempting to record another voiceover narration in the classroom, the students give up and focus exclusively on composing their timeline.

After Tara leaves, the tension between the kids mounts: Mark and Harrison are becoming increasingly uncomfortable with the fact that they are crammed at a small desk, telling each other that they feel that they are sitting too close. The three children switch places, move their chairs and even try to spread out a bit more. To no avail. As soon as another group of students is placed to their left, the space becomes more crowded. It becomes very difficult for Carrie, Mark and Harrison to communicate: because of the ambient noise, the students have problems hearing each other. Harrison grabs the storyboard and glances at it for a few moments.
Figure 5.13 Harrison looking at the script

Meanwhile, Mark switches places with Carrie (who now ends up in the middle) and together, they engage in Recursivity, watching, in silence, the movie a few times. Suddenly, after reviewing the storyboard, Harrison glances at the group, elated. It is this moment that marks a turning point in their collaborative process: for the rest of the day, and in fact, of the project, Harrison will be the only student who will constantly and continuously engage with the paper-based storyboard. He will act as a mediator between the paper semiotic resource and the digital platforms that orchestrates them, be it GarageBand or iMovie. Under Harrison's watchful eye, nothing will get on the timeline that is not checked against the storyboard. As Mark and Carrie are continuing to review the movie, Harrison suggests that they add “flowers and berries.” Carrie grabs the iPad, but Harrison grabs the other corner and attempts to bring it closer to himself.

Harrison (*looking at the video and image sequence, excitedly*): Ok, ok!

Mark (*intervenes*): I just wanna change...[he tries to reposition a video on the timeline]

Carrie (*alarmed*): What do you wanna change?

Harrison: The flowers, isn’t it?

Carrie imports a picture of a magnolia tree and places it between an image of a tree and the video of a medicinal plant that the students called “frog leaf.”

Mark (*displeased*): Not there!

Carrie deletes the video of the frog leaf.
Harrison *(reading from the storyboard)*: Next is, we need healthy ecosystems because plants and animals are our food supply...*(pointing at the iPad's library)*. We need photos of...umm...trees...This is good, this is good, this is good!

Carrie imports a video of trees and grass in the park after the magnolia tree.

Harrison *(looking again at the storyboard)*: Next is, if you wash a frog leaf...

Carrie is holding the iPad and browsing for a frog leaf.

Mark *(echoing Harrison)*: Frog leaf...

Harrison *(looking at the iPad)*: A medium picture should be good...Let’s put the video then! [he indicates that he would have been happy with a picture of the frog leaf, but the video is good too]

Carrie relocates the frog leaf clip in the library and imports it at the end of the timeline.

This exchange shows that the introduction of the storyboard brought along a new phase in the movie collaborative practices in the group. Since Harrison is now focused on the paper-based storyboard, he no longer attempts to touch the screen and the students fight less over who has control over the device. Mark returns to his position as “tech” person, while Carrie’s role in choosing and orchestrating modes (images and videos) is increasing. As Carrie gains more access to the iPad and Mark shares the digital responsibilities with her, it is Carrie who selects the images and videos and consults with Harrison over their fit with the storyboard. I will argue here that, once the storyboard’s role as an OPP increases, thanks to Harrison’s influence, the process of visual modal orchestration becomes faster, smoother and more efficient. This orchestration, however, will never be linear and straightforward at all times since the students import random images alongside pertinent ones. Throughout this process, Harrison continues to pay attention to the storyboard. Dissatisfied with the image and video representation of “healthy ecosystems” he continues to press his teammates to look for more pertinent visual aids.

Harrison *(looking at the storyboard, then pointing at the screen)*: We need healthy ecosystems is the last one [meaning the last addition to the timeline].
Carrie (looking confused and echoing Harrison’s words): healthy ecosystems...umm...

Both Carrie and Mark pull back their chairs away from the iPad, and seem baffled, but Harrison doesn’t give up. He is the only one standing while glancing back and forth at the storyboard and at the iPad. He is checking each and every sequence on the storyboard against the timeline.

Harrison: Litter, this...No 7 is the frog leaf, we don’t need that one...number 8...healthy ecosystems, let’s see... (he leans over and starts browsing through the iPad’s library, while Carrie and Harrison move further away from the device)
Mark: We need to find something that...oh, no, no *(touching the iMovie’s library)*: we could show Ceia, talking about healthy ecosystems...you know...Ceia ...you know, that girl?

Carrie *(looking at Mark)*: Clarisse?

Mark: We can add there [points at the timeline, but is not looking at the storyboard]

Carrie *(finding the video footage of Clarisse talking to the students in the iMovie gallery)*: Here, here, here..
Harrison (*disappointed*): That is not Clarisse!

Mark: That is Dana!

Carrie: No, here...(*she points at another segment in the library*)

Harrison and Mark (*approvingly*): Oh yeah...

Mark (*still browsing the iMovie gallery*): I don’t want that one [meaning a video that shows Clarisse]....where is the one Dana made? [he is referring to a video shot by Dana where Clarisse is heard, but not seen, talking about healthy ecosystems]

Carrie (*pointing at one clip in the gallery*): Here?

Harrison (*goes back to the storyboard*): Which one is the one in which she was talking about ecosystems?

Mark (*finds what he was looking for and imports the video on the timeline*): Yes, right there, yes, we’re done!!! (*Raises his arms, triumphantly*).

Harrison: We’re not done yet.

Carrie rewinds the movie to the beginning.

Mark: Yeah, but we still need to put in the sound in, right?

Harrison: And you talk, ’cause we have to record in the other room...

Mark (*very enthused and starts singing*): We are done, we are done!

The students rewind the movie, huddle around the iPad and watch it from the beginning while Harrison follows along on the storyboard.
The collaborative effort between Harrison who uses the storyboard and Mark and Carrie who focused on the digital device, helps the group compose their movie relatively quickly. While Harrison’s insistence that the iMovie timeline contains all the segments included in the storyboard, he understands the importance of repositioning and editing clips on the spot. On numerous occasions, Carrie and Mark engaged with the iPad to shorten video clips that seemed a bit too long and Mark added transitions between segments. These were esthetic components that Harrison embraced wholeheartedly. Moreover, Harrison recognized the importance of adding voiceover narrations on the spot and not later in the day as Tara suggested. It is important to note that Harrison, despite his attachment to the paper-based unimodal OPP (the storyboard) understands the importance of multimodal (adding voiceovers) components in the movie. As the students finish assembling the for the day, Harrison and Carrie rewind the movie and watch it from the beginning. They both nod and smile. The format seems to satisfy them. As I glanced at my field notes, I noticed that until they reached the sequence that I present below, the students combined images and videos in 17 different ways. After reviewing my video data for this analysis, I discovered that Mark, Harrison and Carrie have engaged together or separately in 21 acts of Recursivity, meaning that they reviewed the 1 minute and 15 second movie (as it was at the end of Day 2), 21 times.
Figure 5.18 Harrison reviewing the footage one last time

Before the group headed over to the recording room, this is what their timeline looked like at the end of Day 2. I used separate colors to recreate—in the text—the sequence of images and videos in the iMovie timeline.

Picture of the entrance of City Park

Picture of a tall tree

Video of frog leaf

Video of Harrison picking up litter

Video of a magnolia tree

Video of frog leaf (still a duplicate)

Picture of a bush with white flowers (new addition)

Video of grass and trees in the park

Video of Clarisse explaining the importance of plants and bees
After recess, the three students move to a separate room on the second floor and Tara indicates that it is time for them to record narration. At this point in the moviemaking, their timeline is yet to be reviewed by an instructor. Mark takes the iPad, opens GarageBand and hands over the external mic to Harrison who is seated between Mark and Carrie.

Figure 5.19 The students getting ready to record the voiceovers

Harrison (*fidgeting and sounding nervous*): Practice, practice, practice, I will read the first one.

Mark is trying to set up GarageBand and is showing Harrison how to tweak the microphone’s volume. Harrison seems pleased and is asking Mark to tell him when to start reading.

Mark (*starts the recording and signals Harrison*): Now

Harrison (*reading and moving closer to the microphone*): We protect City Park to make it better and to make it peaceful for every organism

Mark (*taps the screen*): Good!

Carrie reads her paragraph. When she is done, she looks at Mark.

Harrison (*turns the microphone towards Mark*): Now, it’s your turn! (*smiles*)
Mark: I don’t want to. I am the technical person, because I need to!

The recording session starts, but the students find it extremely difficult to convince Mark to record a narration. Finally, Harrison and Carrie give up and watch Mark as he busies himself with saving each of the recordings in GarageBand. He labels them after the name of the person who did the recording and the number of the recordings the student did. Overall, the GarageBand library has approximately 10 recordings, named after Harrison and Carrie and labelled as follows: “Harrison1”, “Harrison 2”, etc. and “Carrie1”, “Carrie 2”, etc. How this labeling will cause problems the following day, will be discussed in the next chapter. For now, suffice it to say that the students seem content with what they have accomplished. Tara stops by for a few minutes and watches the movie together with the students. She asks the students to take turns and read the narration from the storyboard out loud as the movie is playing on the monitor. Carrie and Harrison agree, but Mark refuses. He insists that he is the “tech person.”

Figure 5.20 Tara giving the students feedback

After they finish watching the movie and the students are done reading, Tara offers useful input regarding video making, particularly in relation to paying attention to the connection between the images and the voiceover narrations, a suggestion that will become the main guideline for the students on the following day. She reminds the students of the importance of the audience and of using different audio and video aids.
She does not ask if the students followed the storyboard when putting together the movie, but emphasises the fact that they need to think of a “logic” and of a “storyline” each time they review the footage. Sadly, she does not have enough time to engage with the students since the bell interrupts their conversation. The students take the iPad back to the classroom. Day 2 of video editing has come to an end.

5.4. Conclusion

It is important to note that, as opposed to Day 1, where the iPad was used mostly as a text-to-speech device and as a timer to motivate the students to finish the storyboard faster, on Day 2 the iPad plays a more complex role: it is a material OPP that the students need to master in order to compose the movie, it is a blackbox, whose embedded apps provide opportunities for performance epistemological exercises (such as learning on the fly how to record voiceover narrations in GarageBand, or how to disable iMovie’s distracting metronome), and it is also a semiotic resource, meaning that it can produce modes such as videos, images, and record sounds. While the students have used the iPad as a camera before (when they were invited on a guided tour of City Park), on Day 2 the iPad complexity as a semiotic resource is put to the test when it is employed as a recorder of sounds of nature and the students’ narrations. The students start their day in the park recording birds chirping and end the day recording their voices. This second action—reading from a paper and recording to a device, is theorized by Gunther Kress as “transduction.” As I will explain it in greater detail in the following chapter, Kress (2008) defines transduction as the process of transferring one mode (in this case written text) into another (speech). While Kress’ theory has been acknowledged by multimodal researchers (Jewitt, 2008) as having tremendous potential for analyzing human interaction, it is yet to be taken up in iPad video composition research.

On Day 2, we notice an uptake in Harrison’s engagement with paper-based literacy practices (the storyboard), and a persistence in engaging with digital-based literacy practices (the iPad) in Carrie and Mark’s case. While these paper-based and digital-based modes of composing were envisioned by the instructor as complementing each other, the students, particularly the two boys, used them as means of affirming their competence in one or the other: Mark resisted engaging with the storyboard and insisted that he is the “tech person,” while Harrison positioned himself as the keen
follower of the order in which the movie is constructed on the storyboard. Unbeknownst
to the students, on the last day of video composition the two boys will work together:
Carrie will miss school. I hereby invite you to “follow the actors” on their last day of video
composition when the exchanges between the two students become more intriguing.
Chapter 6.

Day 3 of Video Composition: From GarageBand to iMovie

6.1. Overview

Day 3 paints a somewhat different picture from the previous two days of video composition. On Day 1, the students focused on selecting images and videos and created a storyboard based on a written script. Day 2 found the students actively engaged in creating a visual timeline in iMovie, with one student constantly comparing the iPad timeline against the paper-based storyboard. With time left to spare, the students also completed most of their voiceover narrations and saved them in another app (GarageBand). The last day was supposed to be less intensive, with the students fine-tuning their timeline, tweaking the sound recordings, adding credits and music and engaging with the teachers and videographers in a dialogue about their work. However, on Day 3, things move in a different direction: the students in this group continue to work on their timeline, changing and adding visual and audio modes until the very last minute while refusing feedback from the teachers. On Day 3, the act of “cognitive wrestling” (Fulwiler & Middleton, 2012), the balancing between Compositing and Recursivity, never actually winds down as the students put their collaborative practices to work in a different direction: adding voice-over and music while still struggling with the order of images and videos.

What started on paper on Day 1 (scripting, drawing, storyboarding, image selection), morphed over the next two days into a complex multimodal product (a short documentary) that combined images, videos, sounds and text. These three days of intensive video composition revealed complex multimodal processes through which students came to understand the “power and affordances of different modalities-and combining modalities in effective and appropriate ways” (Shipka & Selfe, 2014, cited in Lutkewitte, 2014, p. 195). Before I start describing Day 3, I think it is useful to point out that, given the complex layers of image, sound, and video that come into play on this last day, clarifying the notions of “mode”, “semiotic resource”, “transformation” and “transduction” will help the reader gain a better perspective on the digital video
composition practices. Generally, pictures, videos, gestures and speech are, according to Kress (2011) and Zhao and Van Leeuwen (2014) examples of modes, which carry meanings established through community practice. On the other hand, semiotic resources represent:

[T]he actions, materials and artifacts we use for communicative purposes, whether produced physiologically--for example with our vocal apparatus, the muscles we use to make facial expressions and gestures--or technically--for example with pen and ink and computer hardware and software--together with the ways in which these resources can be organized. Semiotic resources can have a meaning potential, based on their past users, and a set of affordances and all these will be actualized in concrete social contexts where their use is subject to some form of semiotic regime (Van Leeuwen, 2005, p.285).

When it comes to focusing on the processes that involve how semiotic resources are distributed and become modes, two other notions come to mind: 1) transformation defined by Kress (2005) as “changes that occur within a mode” (p. 235) for example, when translating a novel from German into English, some meanings and nuances can be lost: although we are working in same mode (written text), changes still take place. On the other hand, 2) transduction, a term coined by Kress in 1997, is a process where a mode is reconfigured in a different mode. For example, writing (a mode) can be “remade” as a moving image (another mode). During transduction, Kress argues, as meaning is remade, the new mode will still carry traces of the original mode (we say, for example “a movie based on a novel by author X”). I needed to call attention to these four elements at this point in the data analysis, and not earlier, because as the next pages will show, from a multimodal perspective, Day 3 is, by far, the most complex: pairing images to the sounds, arranging and rearranging the order of visuals and the aural modes, yielded rich information about the ways in which the students engage in multimodal orchestration (Jewitt, 2003; Rowsell, Kress, Pahl and Street, 2013).

6.2. The Narrative

On Day 3, as soon as Mrs. Warren finishes taking attendance, Tara takes over. Time is of an essence, since this is the last day and there are a lot of tasks on the agenda. Tara asks the students to look at the board which displays a set of pre-written instructions and drawings. At the first glance, one notices that it looks like a series of five linear rows, each row containing empty rectangles separated by “+”. As the instruction
enters in full propositional mode, Tara explains what each of the rows represents while the students seated at their desks are paying close attention.

![Figure 6.1 Tara showing the students the linear steps of movie-making](image)

Figure 6.1 Tara showing the students the linear steps of movie-making

Tara explains that the rows on the board are a breakdown of the phases of the video editing process, namely an example of how movie-makers usually plan their video editing around five stages, with each stage creating a build-up for the next.
According to Tara, these five distinct, stand-alone stages are:

1) **The Rough Assembly** is depicted by a number of empty rectangles representing one mode (image or video) separated by “+”. At this stage, Tara explains that the students are expected to “just assemble the pieces together, start putting pieces together, we don’t have to change everything right away”. Basically, what she is indicating here, is that in this stage, a rough, unedited version of two modes (image and video) are put together to give students an idea of how their timeline looks. As she talks about putting pieces together, she points at the rectangles, from left to right, mimicking what Kress (2005) describes, the traditional, linear way of engaging with text in Western civilization.
2) The next movie editing phase, Tara continues is “The Rough Cut” also depicted on the board as a row of neatly arranged, albeit smaller rectangles (modes) separated by “+”.

At this point in their movie-making, Tara explains, the students need to:

Really start to connect the images to the narration that we have in our script, so we start to actually get out our script, really closely and look and start to match it, I think most scripts are at this point. You can see how the shots start to get shorter, there is more of them in the same space, and on top of that, it starts to, we start to clearly view transitions, like we talked about yesterday, not everyone is a cross dissolve, and not everyone is the same. So, you really start to watch it together and you (holding an invisible script) say your narration out loud while you are watching your movie.

3) Tara moves on to the next stage of the editing process which she calls “The Fine Cut”.
Figure 6.5 A close-up of the “Fine Cut” phase displaying the voiceover additions.

This is when, according to Tara, the students should work on “piecing” (her wording) the movie together: the groups start recording their narration in a separate room so that the quality of the sound will not be affected as they add their narration to the iMovie timeline. The process of “matching” images and voice-overs, she stresses, is extremely important; the images (visual mode) and the narration (aural mode) have to correspond to each other. What she is actually describing in multimodal terms, is, in fact, a process of transduction.

4) Phase four of the video editing, is called “The Sound Mix” and it involves “leveling” (her wording) the sound, i.e. making it sure that the music and the narration are not recorded at different levels, therefore distracting the audience. Working on enacting changes within the same mode (sound) is, actually, an example of multimodal transformation.

5) Finally, Tara, continues, at the end of the day, and depending if they have time, the students are welcome to make some music of their own in GarageBand (what in multimodal parlance we would call modal orchestration) and use it as a backdrop for their project. (“Creating Music”).

6.3. Analysis

Throughout the presentation, Harrison seems visibly restless. He stands up and looks around the classroom. When the door opens and Mark shows up, albeit a bit late, Harrison becomes visibly relaxed. The boys smile at each other, and move to the far end of the classroom. Tara encourages students to ask for help should they need guidance, and reminds them to keep looking at the board while they continue their movie editing.
Harrison and Mark rush to grab their iPad from the teacher’s desk and start working. Harrison keeps looking around the room. Carrie is absent today and will not be joining them. Mark turns on the iPad and connects it to the monitor that was already set up by Mrs. Peterson. Harrison places the paper script next to the iPad. As soon as they are seated, the boys ignore the board. Instead, they open GarageBand and start scrolling through a series of recordings named after the person who created them on the previous day: “Carrie1,” “Harrison4,” “Harrison5” and so on.

Figure 6.6 Harrison and Mark accessing GarageBand

Unfortunately, my camera is positioned at a distance from the students (I tried to allow them space to maneuver and to prevent them from knocking it over or tripping over the tripod), and therefore, I cannot always see which recording they are selecting. Harrison taps once on an icon in GarageBand’s library using his right index finger, while his left index finger taps open the drop-down menu that gives him the “send to iMovie” option. As soon as he completes this step, the interface changes from the GarageBand to iMovie and the sound clip, depicted as a long blue strip is placed automatically at the beginning of the timeline.
Figure 6.7 A close-up of the iMovie timeline displaying the overlapping (blue) sound recordings

The result frustrates the children. As seen in the image above, the blue lines at the bottom of the timeline depict three overlapping recordings with no way of knowing which recording was just imported, and which recording was there before. This overlapping is clearly affecting the quality of the movie. Once they press “play” Harrison and Mark hear a couple of recordings “speaking” over each other. They stop the movie and think of a solution. This episode is an example of how students employ performance epistemology: they try working out a solution on how to order these three overlapping modes so that they form a coherent story. Mark pulls the iPad closer to him while Harrison follows his every move. Mark attempts to touch the iMovie’s play button, but Harrison stops him.

Harrison (*makes a sudden grab for the script*) We have to match so…can we just look over it if the…um… (*looks at the paper, confused*)
Mark (ignoring Harrison and focusing solely on the iPad’s timeline): “Wow, this is not anything, it has no voice”

Harrison (still holding the paper and pointing at the timeline at the blue lines depicting the overlapping recordings): “There’s too many…”

Mark (moving the timeline to the left): Yeah, I know, but, we’re gonna make it messy and then we’re gonna make it nice and normal”

Harrison: “Can I do something?” (he glances at the paper, puts it on the table and scrolls through the timeline back and forth and then all the way to the beginning): We need to match this one! [he points at one of the blue toolbars that are overlapping]

Mark: No… but we have to hear it too! So make it… look! (he takes over and touches the iPad’s volume button).

Harrison (allows Mark to crank up the iPad’s volume): Not too big…

Mark starts the video from the beginning. Both students watch the timeline intently. The video starts with the images of the park and Harrison’s voiceover: “We protect City Park to make it better and to…”

Harrison (presses ‘pause’ and glances at the script): Wait, wait, wait…which one is that?

Mark (points at the section one of the toolbars): We protect the park…that’s Harrison…so we need… this one first [points at what appears to be the first section of the script].

Figure 6.8 Mark attempting to order the sound recordings imported in iMovie
The exchange exemplifies a more complex multimodal way of creating a movie than we have seen in the previous two days. The diversity of modes (visual and aural) and their overlapping shows the paramount importance of collaborative work: a student alone would have probably found it harder to follow the recordings and arrange them in order on the timeline (transformation), while, at the same time, having to keep track of what was already recorded, changed from written to aural mode (transduction). In this sense, we see a division of tasks between the two students that happens organically: Harrison will be, henceforth, responsible for keeping track of which parts of the script (written mode) have been recorded (transduction), while Mark is focusing on importing and rearranging (transformation) of the recordings in iMovie.

Mark changes the iPad’s interface, switching from iMovie to GarageBand. The boys browse the GarageBand’s library which contains identical icons displayed on 3 rows.
Figure 6.10 The students’ recordings, as they appear in GarageBand

Harrison *(incredulous)*: Harrison 1...ummm... *(he looks at the GarageBand library)*...let’s just hear all of them!

Figure 6.11 Mark engaging with GarageBand and Harrison looks on

The following exchange sets the tone for a repetitive process of sound and image alignment that exasperates the two students throughout the entire last day of video composition. The constant flipping back and forth between iMovie and GarageBand and the inability to properly identify the recordings other than by vague names, along with the automatic importing of sound voiceovers at the beginning of the timeline takes a toll on the students’ patience and enthusiasm.
Additionally, transferring and moving the sound recordings on the iMovie timeline, brings to the fore a new layer of complexity: it shows the struggle of bypassing two paper-based OPPs (the 5 editing steps on the board and the script), while figuring out how and where to place the sound recordings on the iMovie timeline. The previous day, albeit very busy, was rather straightforward: the students assembled their timeline (they tried more than 10 different image + video sequences, just to get their movie started), and recorded their narrations. At the end of Day 2, their iMovie timeline had most images and transitions in place. On Day 3, however, the focus shifts significantly, from compositing images and videos in iMovie, to almost exclusively “matching” the sound to the images. If the process of image composition on Day 2 was hard, but not impossible, thanks to Harrison’s diligence in using the storyboard as a reference, when it comes to importing and moving the sound recordings from one app (GarageBand) to the next (iMovie), the two boys seem to be struggling. As a composition mode, sound seems harder to work with than visual modes (images and videos) even if the iPad seems particularly well-suited for an easy transition between modes. In reality, adding voiceovers to the visual timeline is a very laborious task.

Moreover, the above-mentioned exchange exemplifies the importance of understanding the role of semiotic resources in creating modes (Kress, 2011). If the semiotic resource is the apparatus through which a mode is created, then the iPad’s embedded apps (GarageBand and iMovie) act as semiotic resources for creating modes. In the previous days, the iPad was used as a material semiotic resource in the
form of a camera (it captured images and videos). On Day 2, the iPad was a semiotic resource for voiceover recordings. On Day 3, however, the iPad acts as a unifying device for sound and image. But using GarageBand and iMovie in conjunction proves to be a very difficult process. When operating independently, GarageBand and iMovie work fairly well: on Day 2, despite the troublesome metronome, which interrupted the process numerous times, the students were able to record and save all their voiceover narrations. However, GarageBand did not allow students to name their recordings helpfully. They ended up with recordings labelled “Harrison 1,” “Harrison 5,” and “Carrie 3.” Without knowing what these names stood for when they accessed the app, the students had to repeatedly go through all of them to identify the specific recording that they wanted to transfer to iMovie. Additionally, as seen in this image, the students’ frustration was fueled by the fact that each time they imported a sound clip from GarageBand to iMovie, the sound clip was automatically placed at the beginning of the timeline with no possibility to place it directly under the desired video or image which could be further to the right.

Figure 6.13 Another example of how the imported sound from GarageBand (the blue lines) overlap in iMovie

In my estimate, Mark and Harrison spent more than half of the last day importing clips from GarageBand to iMovie, listening to them in iMovie, moving them, then deleting them, moving back to GarageBand and re-recording them.
Throughout the processes of transformation and transduction, as the human OPPs (teachers and video instructor) are less present (the two teachers do not check on the students and Tara tries to engage with them, but they refuse help), the students are relying (at least theoretically) on two material OPPs: 1) the step-by-step and linear outline put together by the Tara on the board, and 2) in a surprising move, the script and not the storyboard they used on Day 2. While the blackboard outline stays on throughout the day, the students rarely, if ever, look up to check which of the five stages of video editing they have completed and which are still left. Instead, they rely exclusively on the script to ensure that all their narrations are imported from GarageBand to iMovie and placed on specific spots on the timeline. At the time of the data collection, it did not occur to me to ask the students the reason for using the script and not the storyboard as the material scaffold for the last day of editing. This was an oversight that I will address in Chapter 7.

As a paper-based OPP (the script) and as digital-based OPPs (GarageBand and iMovie), these three elements have different affordances: the script is an text-based source for the students’ recordings and has no multimodal versatility (it is just printed text). On the other hand, GarageBand and iMovie afford not only creation of modes (taking pictures, recording narrations), but also act as main actors in the processes of modal transformation and are the driving forces behind the students’ collaborative actions. As the following episode exemplifies, adding the layer of sound to the already existing visual modes required the involvement of more than one individual. While they continued to navigate the iMovie timeline in a non-linear manner, importing or tweaking the sound recordings, Harrison manages to convince Mark to finally lend his voice to one or two recordings. The following exchange, depicts the moment when Mark notices that one of the recordings which belonged to Carrie is cut off. Since Carrie is absent on this day, Mark agrees to read the text himself. He grabs the script, looks at Harrison and without missing a beat, announces:
Figure 6.14 Mark reading from the script

Mark *(holding the script)*: Ok, let’s do it!

Harrison *(getting ready to press the record button and gesturing)*: 3,2,1...go! *(presses the ‘record’ button)*

Mark *(reads slowly and with a bit of difficulty)*: How we respect...ugh *(stops and deletes the recording)*: Give me one more chance, ready?

Harrison *(restarts the recording and signals)*: 3, 2, one second, ...go!

Mark *(reads slowly)*: How we respect City Park and animals in City Park. *(Stops)*: I, um, mixed up the words. *(Looks at the script): How do we respect PLANTS *(emphasis)* and animals?

Harrison: *(deleting the recording)*: Ok, redo!

Mark *(playfully)*: One MORE *(emphasis)* timeeee, one more time!

Harrison: *(prepares to start the recording....)*: Yeah,3,2,...

Mark *(pushes Harrison’s hand away from the iPad)*: No! Don’t do it! Let me just do it on my own pace. *(Pushes the recording button and starts reading)*: How we respect plants and animals inside the park. *(Presses the stop button)*: Dang it!!! Wroooooong!!!

Harrison *(seems frustrated)*: Should I read it then? Yeah, I should read it!

Mark *(tries to start up the recording by himself)*: No, I wanna do one more...

Harrison *(holds the finger on the record button)*: Say go!
Mark: Go! *(reading from the script):* How do we respect plants and animals in the park. *(Puts the script on the desk and looks at the recording):* Perfeeeect!

Harrison: Let’s hear it, let’s hear it!

They review the recording. Harrison is not pleased:

Harrison: Ok, let’s just redo that one!

Mark *(deletes the recording and then hands the script to Harrison):* You just do it. We need to finish our work.

While Mark fails to record this narration, his willingness to read, even if it happens relatively late in the project, shows that he has become a little more comfortable with engaging with the written text. The fact that Harrison is able to overcome his frustration over Mark’s reading speed (“Should I read it then? Yeah, I should read it!”) gives Mark a bit of a confidence to try a couple of times before giving up. By the end of Day 3, Mark manages to record a narration but give up in the end and lets Harrison record the segment. Still, this episode provides a rich example of how the process of transduction takes place using different semiotic resources: the script and GarageBand are linked through a collaborative effort. Mark reads from the text-based semiotic resource (the script) and Harrison operates the digital semiotic resource (GarageBand). Moreover, the exchange shows that in addition to being committed to producing an interesting movie with clear recordings and compelling visuals, the students are not only becoming skillful producers, but also critical consumers of digital multimodal texts (Kress, 2010). In this respect, “examining the composing process – or the iterative, responsive, and strategic practices used by individuals when creating texts – can offer much needed insight into how individuals move across modalities and languages to begin meaning negotiation with a real or imagined reader” (Smith, Pacheco & de Almeida, 2017, p. 10). Also, thanks to Tara’s constant insistence that the students remember who their audience is (people who may have never been or heard of the park) the students are working diligently to fulfill these goals and, surprisingly, they insist on working alone: on a couple of occasions when Tara checks on them asking if they need help, Harrison tells her that they are “ok.”

As they are approaching the second half of the day, Tara gently reminds the students to check the board to see where they are in the editing process, since “pretty much everybody is around the rough cut and the fine cut.” While Harrison and Mark are
busying themselves with importing the recordings, they do not pay attention to the board: where they are in the video composition process in relation to the board is seemingly not that important to them. While engaging in one of the many Recursivity actions (rewinding the video and watching it from the beginning), Harrison takes advantage of the fact that Mark left the desk and plays the movie listening intently, his eyes closed. Harrison finishes listening to the entire voiceover recordings, nods and smiles. His audio engagement with the movie allows him to retain the confidence that the storyline is rendered compellingly even if the visual modes (pictures and clips) are excluded.

Figure 6.15 Harrison listening to the narration

As soon as he finishes listening to the recordings, Harrison’s attention is drawn to Tara who reminds the students that they need to add titles and subtitles to their images. It is worth noting that adding subtitles on this specific iMovie version was daunting. As the videographers and the other adults involved in the process of data collection can testify, producing subtitles on iMovie was difficult because of software inconsistencies: some images allowed subtitles, while others did not. Despite the adults’ concerted efforts, we were unable to figure out why students could not add subtitles to all their images. Tara was aware of this software deficiency, but encouraged the students to try their hand at adding text to their images, because, after all, it was a good opportunity to engage with the iPad in a new form: writing. For a researcher in multimodality, this exercise could have been very interesting: seeing how students engage with a new
mode (text), would have provided a more in-depth view of the digital device’s capabilities to afford multimodal collaborative work. However, it was not meant to be. When Mark returns, Harrison asks him to add text under one of the images, but as soon as Mark opens the iMovie subtitle interface, it crashes. Mark manages to type and save only one subtitle, seen below.

![Figure 6.16 Screenshot of the iMovie, showing textual engagement with the iPad](image)

After he saves this image, Mark tries to open the iMovie’s writing interface, produces the virtual keyboard seen below, but fails to make it respond to touch. The willingness to engage with the iPad in creating a different mode (text) exists, however, the software’s affordance renders this operation impossible. After a few minutes of watching Mark try to make the keyboard responsive by pressing various buttons, Harrison loses his patience.
Figure 6.17 Mark engaging with the iPad and trying to make the device more responsive to touch

Harrison (looking at the iPad and raising his voice): Mark, what are you doing? We don’t need that! Let’s just keep on going.

Mark continues to try to figure out how to add subtitles, he opens various drop-down menus in iMovie, but without success.

Harrison (exasperated): We are wasting time because of this. Let’s go! Mark! We’re wasting time with the optional things.

The boys abandon the task and resume the recursive revising of the video footage. They add or change the transitions between clips, and stretch the images so that they fit nicely over the sound recordings, and make sure that every image or video has accompanying sound, be it narration, “sound of nature” or music. The image depicted below is a screenshot of their final project, and shows how the students meticulously tried to match the length of the images to the length of the recordings.
Figure 6.18 Screenshot of the final segment of the movie

This screenshot also displays the varied, multimodal layers that the iMovie interface afforded the students: the timeline comprised of videos and images separated by transitions, and, coloured in blue and purple, the sound recordings that were added and neatly trimmed to fit underneath the visuals. But a closer observation reveals that there are some images that cannot be seen in the library, and how they became part of the timeline makes up an intriguing part of Day 3.

Researchers agree that, while a mode is shaped by sociocultural factors that imbue it with histories and possibilities for constructing meaning (Smith, 2016; Jewitt, 2008, van Leeuwen, 2005), it also allows users enough leverage to repurpose it for their communicative practices. With less than 20 minutes left in their project, Harrison and Mark are re-watching their movie and reach the part of the movie where the voiceover recording says: “littering is a problem because animals can eat it and get sick and die.” Mark has an idea.

Mark (looking at Harrison): Dude, dude, dude!!!

Harrison (looks at him startled): What the heck? What?

Mark grabs the iPad and with a click on the main button leaves the iMovie interface and opens the Internet browser.

Harrison (alarmed): What are we gonna do now?
Mark (*typing out loud*): Littering pictures in park

Harrison: Do you want me to do it?

Mark nods.

Harrison (*starts typing*): Littering in what?

Mark: Littering in park

Harrison: Why do we need this?

Mark (*ignores his question and points at the screen*): Images!

Harrison: OMG... where is the litter? Oh, that’s the litter!

Mark (*spots a picture of a duck eating a can*): There, there, there! See?

Harrison: We have to take it... oh, that is good, that’s good. We need to save it.

Harrison saves the image and moves it to their iMovie timeline.

![Figure 6.19 Mark looking at the monitor and trying to figure out which Internet image he likes best.](image)

Engaging in Internet searches was not discouraged by the teachers: throughout the duration of this project, especially when they prepared for the visit of a professor who discussed the history of the park and when they worked on the script, the students
browsed the Internet, looking for images. However, these actions happened always under adult supervision. Throughout the video project, both teachers and the videographer insisted that students use only materials that were not protected by copyright. At one point, when Mark asked Tara whether they can use a song from the Internet as background music for the movie, he was told again that that was not possible. However, as the movie was nearing completion, Harrison and Mark engaged in a series of searches and image imports that may add another visual layer to their story. The online images may have served a different purpose for the photographers and carried a different intent. However, once “appropriated” albeit while infringing copyright laws, these visual modes were used to complement, enrich and support the spoken, narrative layer of the iMovie timeline. While the act of enriching and supporting a narrative layer is noted to be part of a common trait of multimodal interactions as Smith, 2016; Jewitt, 2008 and van Leeuwen, 2005 pointed out, the appropriation of images without citing a source or obtaining permission to reproduce it makes the act of engaging with the Internet “thorny.” While I do not intend to downplay the importance of Internet copyright laws, I will focus on the fact that the students engaged in the image search and retrieval without malicious intent, stemming from a need to complement the existing narrative. After browsing and, by now, knowing their visual data by heart, the students found the Internet images more appealing: The visual modes afforded by the Internet search became too tempting.

**Figure 6.20 Mark pointing at an Internet image**
By making this conscious choice of importing an image that fits their narrative, Mark and Harrison focus more on their imagined audience and on providing compelling visual modes to their narration. In this respect, they are reverting to the practices of the previous day, when they used the storyboard as a semiotic resource to identify and import their own images to the timeline. It is still a form of transduction, happening nonlinearly (at this point, the students are still supposed to follow Tara’s outline displayed on the board and work on their recordings), but the mode that is produced is not a recording, but rather images imported from the Internet.

As soon as they finish importing the images, the boys scroll the iMovie timeline back and forth, revise the footage together, tap on the recordings to ensure that none of them are louder than the others and import a soundbite from the iMovie’s music library. This last engagement with Recursivity allows Harrison and Mark to grasp a sense of what their timeline was missing, namely, a background musical layer that keeps the viewer engaged due to its upbeat tone. They review the footage one more time. Pleased with the result, the boys raise their hands. Their movie is finished.

At this point, Paula, one of the videographers notices the students and asks them to “present” their movie for the camera. She turns the monitor towards a stationary camera, while Harrison and Mark remain seated. Harrison keeps the iPad on his lap and presses the “play” button.

Figure 6.21 Mark and Harrison showing their movie to the videographer.
As they play the movie, Harrison is still holding the iPad and Mark looks at the monitor and smiles. He seems pleased. Paula asks Mark why they didn’t include certain videos and images in the final cut. Mark brings up the topic of the “frog leaf”, a type of leaf that the park guide told them that could be used for healing wounds. Pressed to elaborate on the reasons for excluding the “frog leaf” from the final footage, Mark explains:

Mark: You don’t really know. Is it truly heal you? Is it really truly heals you? We don’t know. So, um... So we don’t know if Clarisse was right, or wrong! So, we didn’t really want to leave the frog leaf in (looking at Harrison).

Harrison (looking at the iPad and scrolling back and forth): Yeah!

Paula: So, what was the best part?

Harrison (smiling and scrolling through the timeline): Best part...best part.... (still scrolling) ...the best part thing was...um...no, no, I like this part [shows the image of the flower, the video of Harrison picking up litter and the bird]... this part and this part and this part...

Mark: The hard part... (hesitates) that was the hard part...making it perfect, making the sound equalizer.... because, you know, umm... if we make the music too loud....umm...you can’t hear the voice to you have to make voice to the max and make the music a little lower... But if you make the music too low...

Harrison: You won’t be able to hear anything...

Me: So, did you enjoy it, did you like it, guys?

Harrison (smiling): Yeah, it was fun!

### 6.4. Conclusion

Overall, the third and last day of video editing revealed complex processes of modal transduction and transformation along with a raised awareness of the audience which was not visible in the previous days (the students engaged in conversation regarding how compelling and engaging their video should be). In this respect, the project was a collaborative effort of multimodal composition. Lauer (2014) stated that “the notion of the author as being a single, solitary voice communicating to his or her audience through a finished product has been transformed as communications media have opened up the possibilities for textual production to be non-linear, hypertextual,
continuously revisable and interactive” (cited in Lutkewitte, 2014, p. 25). While the boys did not receive any formal feedback on this last day, as the teachers and the videographer were busy trying to secure empty rooms for the other groups to record their narrations, Mark and Harrison managed to finish their movie. If on Day 1, writing (producing a storyboard) as a mode carried most of the informational value, Day 2 through the process of Recursivity and Compositing, was used mostly for assembling the visual components of their timeline. On Day 3, the informational mode shifted once more, this time in favor of voiceover recordings (speech). Throughout these three days of video composition, the process of transduction allowed for two (or more) modes to come together. Of course, the question one can ask is “which of the two modes carries more gravitas or ‘informational load’?” (Kress, 2005) and the answer depends, not only on the modal pairing, text and speech (on the first day), or image and speech (on the last day), but also on how the viewer, independent of the authors’ intentions interprets the multimodal product. In this respect, I need to note Mark’s response relating to the reason why the boys deleted a segment that was present both on their storyboard and on their timeline throughout most of the second day. Mark explains that they were unsure this leaf can “truly” heal burns. Excluding the segment because they claim that they could not test it in a real-life situation, shows that Mark engages in what Kress (2003) calls an “epistemological commitment”, namely that the multimodal assemblage process can be based on a set of pre-determined set of conventions: script, storyboard, the “5 stages of video editing,” but, ultimately, the affordances of technologies provide students the freedom to process and review their choices. By deciding not to provide unverifiable information, Mark shows that he does not respond to a higher authority, but rather to his own point of view.
Chapter 7.

Conclusions

7.1. Reflecting on the project and my involvement

The topic of this thesis has preoccupied me for a long time. Being married to and in direct contact with a lot of computer scientists and technically-inclined individuals has left an indelible mark on the way I relate to the world and on my need to be constantly “in touch” with the latest news from the field of technology and science. However, over the years, I have become more aware of the “technical bubble” in which I am living: I always have a friend around who can answer a technology-related question, but not a lot of people with whom I can discuss the educational implications of using technology in everyday life. When I participate in conversations with my technology-inclined friends, I am, quite often, struck by the fact that, just as the larger mass of consumers of technology, they seem to be more concerned with the latest device, the latest operating system or the upcoming technology that they believe it will most likely revolutionize our lives. When I steer the conversation away from creating faster, smaller, more sophisticated devices, to the idea of usefulness of technology the conversation turns serious: optimism is still in the air, but there is not much sociology-related research to back it. It is this concern with how exactly technology impacts our lives in general and in school in particular that has guided me throughout this dissertation. After learning of the huge investment and of the relatively poor educational outcomes of iPad introduction in the Los Angeles Unified School District, the topic of how technology impacts classroom dynamic intrigued me even more. While the scale of the problem (an entire school district versus a classroom interaction) is entirely different, after reading more on the district’s lack of engagement with literacy educational researchers before making the financial investment, I decided to look at the processes and resources, both material and non-material that inform classrooms interactions. While the LAUSD experience failed partly due to novelty (at the time of the iPad purchase, the device had been on the market for a short time), partly due to the iPad’s buggy software, and partly due to the lack of research in the field of digital literacy, I was fortunate enough to be part of one of the first longitudinal studies that focused on digital literacy in classrooms where children worked on iPads to create a multimodal product. Thanks to the generosity of my
professors and to their willingness to allow me to work as their RA and, in the last stretch of the project, as an independent researcher, I was fortunate to gain first-hand experience on a literacy research project involving a device that was relatively new in schools, even by 2014 standards. Moreover, at the time when this three-month long project started, the research team could not rely on any studies involving iPads in education and, in my case, despite of weeks of research, I failed to identify any studies that involved video editing on tablets, particularly iPads.

Working from a sociocultural perspective and noting that societies are become increasingly global and fluid (Castells, 2011), I searched for ways to understand how iPad video composition might help literacy research, particularly at a time when, as Kress (2003) aptly put it, recent years have brought to the fore a “move from now centuries long dominance of writing […] and a move from the dominance of the medium of the book to the dominance of the medium of the screen” (p. 1). My research was particularly influenced by Jewitt’s (2008) and Lankshear and Knobel’s (2007) work on multimodality and knowledge production and representation in schools. Moreover, our research group’s focus on technology in classrooms, prompted us to look at the processes of digital literacy production rather than just at the end products (Toohey, et al., 2015). This preoccupation with the process of engaging with digital literacy through a medium that was relatively new, the iPad, led me to seek answers to the following research questions: “How does a group of students overcome the intricacies of putting together a multimodal digital product?” To aid me in the endeavour, I relied on challenging theoretical lenses and sensibilities: multimodality, New Literacy Studies, and Actor-Network Theory. I felt that this dissertation and the study that inspired it were a good opportunity to use these three perspectives as complementary, rather than as discrete entities. As I am bringing this research project to an end, I realize that researching collaborative editing processes on a digital platform did require this triad: without ANT’s preoccupation with understanding how materiality is intrinsically connected to the individuals in creating and disseminating knowledge, coupled with multimodality’s interest in how meanings and made, interpreted and recreated through modes, seeking answers to my main research question would have been incredibly difficult.
7.2. Where did the research journey take me: what did I learn?

Throughout the three months of my involvement as a participant observer of how a short documentary shot and composed on an iPad came to be, I came prepared to be challenged. While I expected my prior immersion in ANT theory (I spent, a full year reading extensively on the topic) to have an impact on the way I approached my data collection, analysis and interpretation. However, I have come to learn throughout this research journey that ANT morphed into a “sensibility” rather than an overbearing theoretical lens. In this respect, it became an incredibly useful tool in “following the actors” (Latour, 2005) both human and non-human, and it helped me shift my focus from researching literacy as purely a human creation to looking at literacy, especially now in the digital age, as a profoundly fluid, non-linear, collaborative process in which meanings can be replicated or recreated depending on human competencies and material tools that are used. In this regard, I found that instead of focusing on the plethora of complex terms that ANT puts forward (blackboxing, symmetry, or sociology of translation), which would have probably yielded another dissertation, my journey of “following the actors” was more manageable when looking at the students, the technology and its affordances, group work, and the teachers’ engagement with students and technology. These obstacles in video composition, which ANT identifies as Obligatory Passage Points (OPPs) became the guiding lines of the dissertation. By following these OPPs and their enactments (human and material), I was able to better understand the processes involved in video composition. This is where multimodality stepped in: by placing a strong emphasis on mode (speech, image, text) and the ways in which these modes are orchestrated (transduced and transformed) throughout the three days of video editing, I gained a better understanding of the modal resources brought to the fore by the teachers (storyboard and script) and the ones used by the students (iPad). Overall, the notions of Obligatory Passage Point, Mode and Semiotic Resource, Transduction and Transformation as well as Recursivity and Compositing, guided this dissertation. Still the question remains: What did I learn especially in the last three days of moviemaking about how students collaborate to create a digital product? The answer cannot be packaged in a single phrase, simply because each of the three days of video editing was set up differently, had different goals and yielded different responses from the students. I will summarize my findings below before attempting to provide an overall impression.
On Day 1, the students were asked to complete two separate tasks: create a storyboard based on the script they put together and to select images and videos they may find useful for their movie. The three children divided the tasks, Carrie was delegated by Mark and Harrison to create the storyboard, while the boys worked with the device to select and save images to iMovie’s library. Day 1 set the tone for creating two types of semiotic resources which the students would combine (composite) and revisit repeatedly over the next two days: the storyboard and the iMovie library. While the storyboard was an exclusively material, paper-based semiotic resource, its creation prompted a series of conflicts between the students and the two teachers, which unveiled the discrepancy in between the overruling propositional knowledge (the teacher has the authority to sanction everything that the student does and has the last say on what counts and what does not count as important to be included in the storyboard) and the students’ performative knowledge. The teachers’ propositional knowledge did not affect the students’ work with the other semiotic resource: the iPad. This happened partly because the teachers were solely focused on overseeing the creation of a storyboard that had neat, linear, ordered episodes, and partly because the students stopped working on the iPads when the teachers were checking on the group. However, the iPad as a semiotic resource offered a multifaceted glimpse of the students’ performance epistemology, namely in the form of utilizing the iPad as a text-to-speech platform, as a metronome and as an image editing tool, competencies that were neither taught nor encouraged by the adults in regular classroom interactions.

Day 2 finds the students engaged in full performance epistemological mode, arduously compositing their timeline on iMovie and working, again, to some extent independently of the teachers. While the group starts their timeline out of order, defying the videographer’s recommendations of working in a linear fashion, they spend the first part of Day 2 painstakingly trying to get their movie started: over a dozen images and videos are “stitched” together and each student is trying to impose their view on what the first scene should look like. The orchestration of different modes (images and videos) is done recursively (they revisit the short collection of videos and images many times to shorten, lengthen and add transitions). Yet, it is this recursivity seen by Fulwiler and Middleton (2012) as an exclusively digital compositional method, that prompts one of the students, Harrison, to use, as a reference point and guideline, the storyboard to import images and videos to their timeline. As Mark and Carrie start focusing more and more on
building up the timeline in iMovie, the action of multimodal compositing is happening under Harrison’s watchful eye. He holds on to the other semiotic, paper-based, resource, the storyboard, and makes sure that when the digital composition process hits an impasse (the students have duplicates, or images and videos that do not really compliment the storyboard), the storyboard is there to help. The process of dividing the tasks and of building up the timeline by having one student acting as a liaison between the paper and the digital, is the first of the many examples of transduction (rendering information from one format—paper—to another format—digital—) that play out during Day 2. Moreover, the students are starting to record narrations while they are building the timeline, based on the textual information they are seeing on the storyboard. The orchestration of modes does not happen in the linear fashion recommended by the videographer, the students defy the advice and add narrations (voice recordings) while they are building the timeline instead of waiting to finish assembling the images and videos first.

Day 3 puts students, albeit briefly, in front of a compositional dilemma. While Tara repeatedly asks the students to make sure that they follow the storyboard when assembling the timeline, she presents them with a fully written outline of how the movie assembling process should look like only on the last day of the project. After hearing about the five steps of video editing, the students rush to meet their teammates and complete the project. Harrison and Mark pay little to no attention to the board: they continue to work on the timeline, re-recording narrations they deem unusable, still engaging in Recursivity and video and sound compositing. Multimodality-wise, Day 3 is not only the most labour intensive, but by far the most interesting. As the adults are busy overseeing other groups and paying only cursory attention to Harrison and Mark, the boys engage in an intense process of collaborative movie-making, where Mark is finally convinced to lend his voice to record a narration and therefore to overcome his shyness over his difficult engagement with the written text. If on the previous days, the students engaged in the process of visual modal assemblage and occasionally steered off the course when they recorded narrations directly on the iMovie instead of the designated app (GarageBand) and at a designated time (at the end of Day 2), Day 3 brings a new layer of modal complexity: the students navigate the intricacies of two OPPs (iMovie and GarageBand) alongside keeping track of their work on paper (the script). Flipping back and forth between the two apps, reveals the shortcomings of the digital devices in
orchestrating modes (the sound recordings imported in iMovie overlap at the beginning of the timeline) and the importance of the paper-based script in aiding students construct and revise the voiceover component of their movie.

While overall, these three days showed a constant struggle between propositional and performance epistemology embodied by the teachers’ and the videographer’s linear views of finalizing a movie, versus the students’ more fluid, non-linear approach to video-making, this study cannot state, enthusiastically, that using a relatively novel technology (iPad) in the classroom has completely overthrown and revolutionized the ways in which students operate in the digital realm. While there were many instances where the students relied on their out-of-school competencies in operating the device and were clearly more comfortable using the tablets than the adults, based on my observations, I can conclude that this video-making project was not an entirely digital endeavour. Without the students’ collaborative efforts and shared expertise, and especially without Harrison’s diligence in using the storyboard and the script as scaffolds for both the image compositing process (Day 2) and the aural recording, transfer and placement (Day 3), the students would have probably had a much harder time creating a cohesive movie.

7.3. Limitations (theoretical, material and personal)

Observing the students engaging in classroom interactions with a relatively new technology and collaborating to create a short movie has offered me the opportunity to witness many moments of surprisingly adept manipulations of technology (activating the iPad’s lesser known “text-to-speech” feature) as well as an encouraging understanding of aesthetic sense (the students looked for the best images and videos that could complement their narration) and a desire to provide truthful information to the audience (Mark’s refusal to include a story about a plant because he was not able to verify its benefits on his own). However, the project had a series of limitations stemming from the theoretical perspective, the affordances of the materials involved and the researcher’s personal presence. I will outline them below.
7.3.1. Theoretical limitations

Researching a novel form of digital engagement (video editing on a mobile platform), called for a number of theoretical lenses that focused on how material objects shape our daily activities. In this respect, multimodality and Actor-Network Theory emerged as the leading contenders, since they provided me with a theoretical understanding of how various modes can be orchestrated to create new meanings or how objects bear the same significance as humans in interactions. While as stand-alone theories, multimodality and ANT have their legions of ardent supporters, they have also drawn criticism from literacy and media researchers: Bazalgette and Buckingham (2013), for example, decried multimodality’s limitations in terms of analyzing the work of children in classrooms as pitting text against the visual while ignoring the fact that “work created by children in classrooms – is dictated by economics, power, convenience and perhaps accessibility, as much as by the suitability of mode to content” (p. 98). Moreover, the same researchers drew attention to the dangerous simplification of digital “natives” vs “immigrants” (Prensky, 2007) which tends to ignore that multimodal communication is more nuanced than what a “generational” divide may show, and it “provides little insight into what people actually do with texts in the contexts of their everyday lives” (Bazalgette & Buckingham 2013, p. 103). While these are well-articulated critiques, I find that classroom interactions will never be able to encompass the whole range of students’ literacy activities. Multimodality can be very useful in looking at literacy practices as complex processes that result from interaction with digital devices. The complexity of a digital text stems not only from the number of modes that it can recall or orchestrate together, but also from the fact that its versatility can make the digital product unique. I have encountered, throughout this research, countless moments that, although rich in the number and scope of the modes they blended together, were never replicated by the students again. As I pointed out in the Methodology chapter, I struggled with the well-known by now problem of multimodal analysis: the fact that modal orchestrations are so diverse that it is very hard to find patterns and codes: each day and each encounter with the technology was unique.

On the other hand, the other lens through which I looked at the interaction with technology, ANT, has attracted its own share of critics: Amstersdamska (1990) has argued that ANT research is purely descriptive and very hard, if not impossible, to use to explain social processes. Moreover, Bloor (1999) is one of the most vehement critics of
the idea that non-humans are endowed with agency, capable to enact change in human relations to the same extent individuals do. ANT researchers responded by arguing that the notion of agency has been misinterpreted as existing a priori to a relation between humans and objects, and that in the new digital landscape agency can be better understood as a process, a result of the heterogeneous relations established between non-humans and humans (Law, 2007; Sayes, 2014). While I have given both these critiques serious consideration, I agree with Amsterdamska, that ANT is a descriptive theory, but there have been a few studies that have employed ANT’s lenses in education (Fenwick & Edwards, 2010; Dagenais, Fodor, Schultze and Toohey, 2013) and media studies (Spohrer, 2016). ANT is not a simple framework, and by placing emphasis on processes, rather than on end products lends itself fairly well to research involving dynamic compositions such as video editing on a digital platform.

7.3.2. Material limitations

Working with a new technology has been difficult to observe and research. Throughout the project, the students and the teachers struggled with the iPad’s limitations: after the research team purchased a series of external microphones to enhance the quality of sound, the students were encouraged to used them when they interviewed a historian. However, all but one of the five groups forgot to connect the microphone correctly and therefore, they could not use the interviews in their movies. The group I observed was one of them. Moreover, the students complained that the iPad’s interface could not engage with more than one person at a time, therefore creating a series of power struggles and conflicts regarding who got to access a feature first. Usually, in the group that I observed, the conflict would be resolved when a student got hold of the entire device and shielded it from the others, or, when he/she slowly positioned (as in Mark’s case) as the “tech” person and took all the touch responsibilities upon himself. In another circumstance, the iPad’s embedded functions interrupted and frustrated the students: when they finally secured an empty room where they could record their voiceover narrations, the students were aware that they had to share the space with other groups and had to be quick and efficient. The GarageBand’s interface was not only clumsily designed (Mark had to look for the record button each time he was prompting his teammates to read, forcing them to restart the process) but it also had a metronome that was being automatically set off each time a recording was about to
begin. With no option of how to disable it completely, Mark had to restart the recordings numerous times. In response, Carrie and Harrison seemed frustrated both with the device and with their classmate.

7.3.3. Human (Participant Observant) limitations

Although I enjoyed participating in the project and interacting with the students as they worked on the iPads, I would have liked to observe them during regular classroom interactions before bringing in the devices and after the project was completed. I could have gained a better understanding of how technology may or may have not changed the classroom dynamic. I am, however, aware that there is no such thing as an ideal research design and that time and logistics constraints (how much longer could the teachers sustain the presence of so many adults in the classroom?) have played an important part in missing out on this opportunity. Moreover, I wish I had designed my observation time more efficiently: my attention span was constantly stretched out, between running to check whether my camera still had enough memory to continue shooting and taking pictures and videos with my iPad which I used as a floater and taking field notes. I had little time to engage in informal conversations with the students and the teachers. I regret not having been able to get to know Mrs. Peterson a bit better, because she seemed as much if not more interested in technology than Mrs. Warren. I also regret not asking the students, particularly Harrison, why he felt the need to alternate between using the storyboard and the script as a scaffold and if he would have preferred to work on a different topic than the one given to them. Finally, as the project moved to the analysis phase, I realized that having read so much on Actor-Network theory was starting to inform the way I looked at human and iPad interactions a bit too much. I tried therefore to step back, go back to the raw data and sure enough, I learned that I may have overstated the importance of ANT. My bias towards ANT was counterbalanced by the plethora of resources that were multimodal in nature that stemmed from my analysis. I allowed the data to steer me more towards multimodality and I believe that this experience will serve me well in the future.
7.4. Implications for teacher education

Working with a new technology (the iPad) which, at the time of the project had no literacy research to back up its use in classroom interactions, required a lot of openness and desire to diversify the students’ experiences. The teachers and the researchers have to be commended for their patience, time, devotion and dedication to work with students who were not only new to the trials and tribulations of video making, but to collaborative (group) work as well. It is worth noting too, that at the time of the data collection, the teachers and videographer had only the Canadian provincial guidelines to aid them in putting together the project. The province in which this study is situated has been aggressively trying to increase literacy rates. The Ministry of Education in this province launched an initiative to enrich early childhood literacy (preschool) programs and, as of 2016, the province unveiled plans to introduce computer coding in its K-12 school curriculum. Overall, the successful creation of a video project and the enjoyable experience reported by both the students and the teachers should be perceived as encouraging signs for other educators willing to introduce multimodal video projects in their classrooms.

7.5. Generalizing the findings

Research from this thesis, especially stemming from a case-study cannot and should not be generalized, since the processes, materials and the participants cannot be assumed to stand for every single classroom interaction. However, researchers who value such notions as translatability (Lincoln & Guba, 2000) argue that the situations, exchanges and in-school literacy practices observed though a case-study lens, provide grounds for comparability with other technology-driven projects. I hope that, as more research in the field of digital literacies emerges, the issue of relatability to this case-study will be fueled by the complexity of multimodal collaborative digital composition processes.

7.6. Implications for literacy and further research

I have pondered a lot over this topic, since participating in the project and coming to the classroom prepared to meet the students has reminded me of the years I spent teaching ESL in Romania. Having had that experience of working with students from
grades one to eight for four years, was and will never be lost on me. I know, first hand, how difficult, tiresome and extremely rewarding working with students can be. I also had the opportunity to understand, a bit more, now that I have moved to the academic side of education, how important these research projects are for both teachers and researchers, and how, researching children and teachers' literacy practices is the bedrock of fostering good curriculum outcomes for our schools. We know that technology's advancement in schools is a welcome and inevitable process, but without continuing to observe and understand the needs and the affordances of literacy practices, introducing the latest device in the classroom with the hope that it will foster a breakthrough in the ways students learn can create the same kind of problems we have seen unravel in Los Angeles. Literacy practices are mirroring the times in which we are living: devices will continue to improve and create new space of literacy production, but for this process to be more efficient and beneficial for students, schools and universities should stay connected.

Multimodality and Actor-Network Theory are not easily “applicable” lenses in a research project, but they hold promise in understanding how the processes of knowledge representation and creation, or the preference for one mode versus the other hold center stage in student and teacher interactions (Jewitt, 2008, p. 241). In a social landscape that is becoming increasingly fluid and global, literacy researchers need to keep up with the times and try to bridge the gaps between their domain of study and other fields that produce devices and software, but have little experience or understanding of classroom interactions. I have come, in a way, in this chapter, full circle: I am embracing the technical bubble in which I live and for the past two years, I have started to enrich my knowledge of computer programming, not only because coding is becoming a curriculum subject for people much younger than myself, but also because without understanding how a computer scientist thinks, the distance between digital literacy research and production will continue to widen. In this respect, I see myself as continuing to work in the field of digital literacy, particularly in the sphere of knowledge representation and production pedagogy, but continuing to branch out and gain a solid understanding of not only how the devices are used as literacy objects, but also how they are created.
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