LITERACY AS AN INTERACTIONAL ACHIEVEMENT: THE MATERIAL SEMIOTICS OF MAKING MEANING THROUGH TECHNOLOGY

by

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SIGNED: Robert Santiago de Roock
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DEDICATION

For Ajani, Sebastian, and Penelope.
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This dissertation focuses on minoritized youth digital literacy practice and participation, drawing on an 8-month video ethnography in a 6th grade language arts classroom with primarily bilingual Mexican-American students in a Southwestern public middle school. The case study utilized ethnographic and video analysis methods to examine interactions through, with, and around laptops in a one-to-one laptop classroom. Multiple simultaneous videos of student onscreen activity and webcams paired with a tripod-mounted camera captured whole class and small group interactions. Students, sometimes in different classrooms, were captured communicating online while interacting with their peers around them. Interview data with individuals and small groups focus on out of school digital media use and involvement in participatory cultures. From the large corpus of data, a few literacy events were picked out to represent broader trends among students. I argue that informal digital literacy practices of one group of girls playing a fashion themed massively multiplayer online game (MMOG) were more complex than formal, assigned practice. Like many of their more affluent peers at other schools, the girls harnessed the affordances of digital media to connect with interest-driven online/offline communities, whereas their classmates generally did not connect deeply with participatory online cultures. In doing so, the focus peer group co-constructed a classroom underlife (Goffman, 1961) that simultaneously created space for their sub rosa (Gilmore, 1986) digital literacy practices while resisting without disrupting the official curriculum or their performance as successful students. I conclude that designers of
learning environments, teachers included, can foster literacy development by utilizing technology to draw flexibly on student digital funds of knowledge (González et al., 2006) while providing a basis for broader social participation.
CHAPTER 1: INTRODUCTION

As new digital media have become increasingly infused into the lives of youth around the globe, the ability of schools to integrate new technologies and the resulting impacts on learning, social participation, and equity requires not only further examination but also robust support. Learning science and literacy researchers have found great potential in using technology in the classroom while documenting that youth non-formal digital literacy practices are often more complex than in-school practices (e.g. Gee, 2010; Lankshear & Knobel, 2006; Mills, 2010). However, these studies have not adequately addressed the complexity and fluidity of literacy practices, tending to focus on more highly digitally literate students while simplifying the ways youth literacy practices blur the line between online/offline and in-school/out-of-school interactions. For example, practices are typically dichotomized between those occurring within school and those occurring outside of school. Such a partial understanding leaves us without a robust basis for creating connections with diverse youth literacy practices to improve literacy education within school address issues of the digital divide outside of school, in particular what Jenkins et al. (2006) call the participation gap, the “unequal access to the opportunities, experiences, skills, and knowledge that will prepare youths for full participation in the world of tomorrow” (p. xii). My research addresses this issue by examining and seeking to optimize day-to-day student uptake of technology in digitally infused classroom ecologies and student lives. I
respond to the call of central figures in New Literacy Studies (NLS) to strengthen the quality and rigor of digital literacy scholarship, such as Moje’s (2009) admonition:

[T]his is a call for clarification of terms and concepts without narrowing, ossifying, or dichotomizing. It is a call for researchers to integrate methods and instruments to capture more fully the power and possibilities of new and multiliteracies. It is a call to design research that could shape the teaching of concepts and ideas unknown to us. (p. 359)

In addressing such calls, my research generally looks at technology mediated literacy and learning practices in everyday contexts with an eye towards design. As such, this dissertation draws on a video ethnography of middle school youth digital literacy practices among a group of low-income girls in a low performing classroom in the Southwest US. The case study students were in a low tracked classroom in a low performing district with a voter-funded 1:1 laptop integration in particular grades. The school was thus in the midst of trying something new with substantial visibility and accountability. The teacher was basically “digitizing the status quo” so, while I continued to gather data on whole class lessons, I ended up focusing on student non-formal practices beyond the formal teacher-sanctioned practices, in particular the case study girls playing a fashion themed online multiplayer game.

I utilized classroom ethnography with a tripod-mounted camera combined with recordings from laptops (screen, webcam, and audio). I later paired video and audio data streams to analyze interactions through, with, and around each of the students’ laptops. Using my own brand of video analysis (Bhatt & de Roock, 2013; de Roock, Bhatt, & Adams, forthcoming) influenced by interaction analysis, linguistic anthropology, and new materialist approaches of Actor Network Theory and
distributed cognition, I closely examined the ecology of student practices across time and space. The ability to later sync grouped recordings allowed analysis of, for example, coordinated gameplay occurring on different devices, in different classrooms, and various days. Fluid and flexible data gathering allowed for the tracing of fluid literacy practices.

Based on my analysis, I argue that informal digital literacy practices, in particular literacy in and around a fashion themed online game, are more complex and situated than teacher sanctioned practice. The classroom pedagogy was generally along the lines of “digitizing the status quo” due to pressures of standardized testing, and the resulting interactions with and around the official literacy perpetuated an alienation from situated learning practices (Lave & McDermott, 2002). Nonetheless, more complex student non-formal practices reinforced classroom projects, whereas less complex ones (games included) did not. Like many of their more affluent peers, the focus girls harnessed the affordances of digital media to connect with interest-driven online/offline communities, whereas their classmates generally did not connect deeply with participatory online cultures. Such a divide highlights a broader participation gap (Jenkins et al., 2006) that threatens to heighten social inequality through an unequal distribution of digital media’s benefits.

**Research Questions**

This study was designed to address the following research question and sub-question:
• What practices are evidenced in student learning through a combination of face-to-face and computer mediated collaboration when engaging with new digital media?

• How do students negotiate different types of literacies, modalities, and norms within classroom settings that include new digital media?

The Forest in the Trees

I argue that doing good research in the world is a messy process that unveils a messy reality, but there are ways to make sense of it. What we find when we dig down into the micro is not only interesting but important for learning. Given such messiness, I make no attempt to explain all of my data; this would be tantamount to describing a forest by cataloging every tree within it. However, I focus on particular illuminative events, like the oddly growing oak tree in a pine forest, as microcosms for interpreting the whole of the data. I extend Law’s (2012) analogy of ponds in the fish: trees are contained in a forest but also a forest is contained in the tree. For fieldwork, this suggests “if we look we will find the whole world folded into a field site or a practice…[i]t is just a matter of paying attention, of going slow, of not assuming too much” (p. 4).

My approach is influenced by the work of Garfinkel (1967), who argued that data is everywhere. Any social occasion can be examined for members’ accomplishment of practical action to inform about whatever norms and practices are present, visible, and accomplished anew for “another next first time” (2002, p. 98). Any occasion provides the opportunity to understand the ways people engage in making sense of each other’s
activities (Koschmann, Stahl, & Zemel, 2004). Sacks (1992) argued that researchers can look at anything closely enough and potentially find “enormous generalizability” (p. 485) because interactional resources and social practices have to be standardized and routinized so that people can understand one another, but that such an understanding is a local and contingent accomplishment.

Such is a justification for focus on a limited number of interactions. However, I seek to provide rich details and the broad patterns within which the details fit in the hope readers come away “both tree-wise and forest-wise” (Moss et al, p. 504). As an ethnography of a population I have spent many years working and living within, I can present the forest view but I cannot represent every tree. I have chosen but a few to discuss in these pages.

The research articles in the Appendices are each shaped for a particular contribution to the fields of literacy and the learning sciences. The first focuses on capturing complexity in digital activity for the Qualitative Research Journal. Following a social practice perspective to analyze the process of data generation in my study, it addresses how video ethnographic methodologies can account for the sociomaterial nature of literacy within the messiness of social participation and learning, including the co-construction of literacy practices with research instruments themselves. The article builds on co-authored work discussing my video ethnographic methodology capturing online and offline interaction, published in Research in Learning Technology (Bhatt & de Roock, 2013), as a chapter in a forthcoming Palgrave edited volume, Digital
Methods for Social Sciences (de Roock, Bhatt, & Adams, forthcoming), and in Language and Education (Bhatt, de Roock, & Adams, 2015).

The second dissertation article looking at digital literacies as interactional achievements will be submitted to the Journal of Literacy Research. Using several clips of the study focus girls on different days, the piece extends New Literacy Studies theory by focusing on interactivity between human and nonhuman actors, showing how material semiotic factors shape youth peer culture and gender play.

The third article on youth participation and identity in virtual worlds for Harvard Education Review addresses how students collaboratively construct a classroom underlife to create space for their informal literacy practices. The analysis reveals how students’ play with classroom boundaries to create an online/offline classroom underlife allowed them to engage in personally meaningful literacy and identity practices that complimented classroom curricula.

**Positionality**

I have frequently heard reference to the unfulfilled potential of the New Literacy Studies framework and grumblings from senior literacy scholars about the shortcomings of the latest literature on digital literacy. In my own journey as a researcher, scholar, teacher, parent, and activist I have paid close attention to both the literature around technology for learning and the realities in the world, particularly in marginalized communities, schools, and homes. I believe my own experiences and work have positioned me to make a solid contribution to both theorizing and designing digitally infused experiences among global youth.
My interest in studying everyday meaning-making practices of diverse youth comes from my own upbringing, experiences working with students and technology in diverse contexts, and observations of my children. I am a digital insider and a near-native, having been an early adopter of the Internet and online communities. I have been a gamer from a relatively young age. However, my perspective is influenced by extended periods of time away from technology and embedded in marginalized, low tech communities, such as teaching bicycle maintained to impoverished handicapped youth while living in rural Nicaragua. My early work in interactional literacy began with my own children, examining everyday interactions around bedtime informational texts and, later, interacting with (and around) new websites. I began developing and testing my research methods in this work and bringing together areas of literature as they helped me understand the data.

**Theoretical Framework**

In the articles that comprise this dissertation, I have sought to bridge a number of different areas of literature: New Literacy Studies, learning sciences (e.g. Sawyer, 2003), and material semiotics (e.g. Foucault, 1980; Suchman, 1987), especially Actor Network Theory (e.g. Latour, 2005). More broadly, I am guided by a commitment to poststructuralist thinking, which is often used to deconstruct and reveal the circulations of power, but also serves well to uncover liminal social processes, such the hybridities and agentic practices of students typically erased in broader discourse. Dialectical materialism is one guiding worldview, in that I see activity and complexity as foundations of learning – and human behavior in general. I therefor look at the material
bases of literacy practices with a non-reductionist approach. In other words, I don’t see systems as reducible to simpler components; the whole is not simply the sum of its parts (Goodman, 1989). While I draw on fields with strengths at different timescales (Lemke, 2001), I see local action seen as constitutive of all others. As discussed above, this is influenced by ethnomethodology (Garfinkel, 1967; Koschmann et al., 2004), which also serves to bridge my research fields.

**The Material Semiotics of Literacy**

In the tradition of New Literacy Studies (NLS), I see literacy as social, distributed, and understandable only within a broader range of contextual factors (Gee, 1991) opposing a cognitive, autonomous notion in which literacy rises deterministically from a technological medium (Street, 1994). I have honed in on the definition of Scribner and Cole (1981), who discuss literacies as “socially organised practices [that] make use of a symbol system and a technology for producing and disseminating it” (p. 236). It was this definition that originally drew me into thinking deeply about what material semiotics could add to my understanding of literacy. NLS scholars Lankshear and Knobel (2007) defined literacies as “socially recognized ways of generating, communicating and negotiating meaningful content through the medium of encoded texts within contexts of participation in Discourses” (p. 224). While this definition is compelling as well, the somewhat disembodied, discursive, and textual image of literacy resonates less when I think about the everyday practices of youth.

In my work, I conceptualize literacy as a networked interactional achievement. The language for this approach comes from two texts in particular, Duranti and
Goodwin’s (1992) edited volume, *Rethinking context: Language as an interactive phenomenon*, which focuses on the shift to understanding context as a product of language use, and Schegloff’s (1982, 1995) work on discourse as an interactional achievement, in which he discusses the importance of action and non-words (like “uh huh” between sentences) in discourse to stress the interactional foundation of speech. This notion of interaction is compatible with transactional theories of meaning making (Dewey & Bentley, 1949; Rosenblatt, 1978), which go beyond simplistic notions of interaction by locating meaning as emerging from a dialectical process between, for example, the reader, the text, and the world. This transactional dialectic process can alternately be described as dialogic, to use Bakhtin’s (1981, 1986) term, in particular as taken up in Tedlock and Mannheim’s (1995) edited volume on the dialogic emergence of culture. I have nonetheless opted to use the more general term of “interaction” to avoid the introduction of or further complication of jargon and thus speak to a broader audience. Further discussing the interaction as networked is meant to expand the above discussions in conceptualizing literacy practices emerging from a network of interacting heterogenous materials, both human and non-human, extended across time and space.

Additionally, much of this dissertation is focused on exploring my discomfort with discussions about “new” literacies. For example, Leu et al. (2005) list three defining points that sum up NLS’s perspectives on new literacies:

1. New literacies are central to full civic, economic, and personal participation in a globalized community and, as a result, are critical to educational research and the education of all of our students.
2. New literacies are deictic—they regularly change as their defining technologies change.
3. New literacies are multifaceted—they benefit from analysis that brings multiple points of view to the discussion (p. 5).

While I agree with the sentiment, I find these points problematic for a number of reasons. They are equally applicable to “traditional” literacies and leave the issue of newness of literacies unaddressed. Furthermore, they simultaneously encourage technological determinism (#2) while leaving technology as neutral (#1) since such a blanket statement erases literacy practices that truly may contribute little to global participation. In my own situated social practice approach, I focus on literacy practices, rather than make claims about the independent existence of particular literacies, let alone “new” ones.

At the heart of the arguments in this dissertation is a non-reductionist approach to understanding literacy and social action more generally. In other words, I do not work to analyze literacy as a system with discrete variables that have distinct existence and static relationships with one another. Rather, networked components of social practice are mutually constitutive and not independent. Social practices like literacy arise from the ongoing interactions of these components. Actor Network Theory (ANT), as a material semiotic approach, provides the means for tracing these networks. In ANT parlance, literacy may be understood as “a product or an effect of a network of heterogeneous materials” (Law, 1992, p. 381). The whole is not merely the sum of its parts but is rather emergent from them, and those parts are fuzzy, intertwined, and extend across time and space as far as any analysis is willing to follow them.

ANT is particularly relevant in thinking of literacy practices given the centrality of technology within both literacy and Science and Technology Studies. Technology
remains an under theorized part of literacy research, although given the pace of technological change, an increasingly salient one. However, a material semiotic analysis is equally valid examining “old” literacies, from pencil and paper composition to children reading picture books. The non-representational attack of ANT is especially the case for such dualisms as human vs. technology, as Law (1999) dramatically states:

Truth and falsehood. Large and small. Agency and structure. Human and non-human. Before and after. Knowledge and power. Context and content. Materiality and sociality. Activity and passivity...all of these divides have been rubbished in work undertaken in the name of actor-network theory. (Law, 1999, p. 3)

ANT literature reinforces my resistance to knowledge transfer models of learning and taking on an “intersubjective learning” (Suthers, 2006) approach that includes non-human subjectivities, which is also influenced by work in distributed cognition (Hutchins, 1995). Latour (1993, 2005), as well as others in ANT, has developed a vocabulary for undertaking an “anthropological analysis of the modern world” (1993, p. 7) including better ways understanding modernity. Figure 1 shows the modernist divide between nonhumans/nature and humans/culture as two ontologically distinct entities (purification) versus the hybrid human and non-human networks that ANT advocates tracing in its work of translation.
Figure 1. Latour’s (1993) diagram contrasting the dichotomizing of nature and human culture with the hybrid networks ANT attempts to trace.

**Situated Cognition**

Literature in situated cognition, social practice theory (Holland & Lave, 2009) in particular, builds on ANT in understanding historical persons as produced through practice and participation. While the move away from a cognitive, isolated view of literacy has proven fruitful, the ways fields like cognitive science regard cognition as situated, embodied, and distributed increasingly aligns with how literacy and learning are viewed. Work in situated cognition stresses “learning in terms of whole practices in actual contexts with collaboration and various tools and technologies” (Gee, 2010, p. 31). In contrast to much work on literacy from sociocultural (among other) perspectives that ignore or even deny the role of mental processes (Gee, 2008), there is a focus on cognition as situated, distributed, and embodied mental processing; Merleau-Ponty (1962) wrote: “Insofar as I have hands, feet, a body, I sustain around me intentions which are not dependent on my decisions and which affect my surroundings in a way
that I do not choose” (p. 440). This approach allows a more productive view of cognition and learning. My own focus on group learning extends the analysis from an individual to a group level, with the advantage of laying bare the learning process; group interaction is in part reflective of individual cognitive processes, but also a transformed, further distributed process in itself.

Interaction Analysis

This concern about realignment of perspectives emerges from the literature on interaction analysis (Marshall & Rossman, 2010, p. 186), particularly ethnomethodology (e.g. Garfinkel, 1967), ethnography of communication (e.g. Gilmore, 1986; Hymes & Gumperz, 1972; Saville-Troike, 2008), and linguistic anthropology (e.g. Duranti & Goodwin, 1990). In analyzing interactions we cannot know what someone is thinking, we can’t look inside their head, nor can we understand what they say to be direct expressions of their thought processes. We can understand their speech contextually, in terms of the genre being employed, the theme underpinning their statement, their contribution to the unfolding of conversation, and its significance in social participation and ongoing human activity. This approach allows for deeper understanding of both micro-linguistic processes and the meta-linguistic context of the speech. Each aspect of analysis constitutes tiers of a framework for understanding “what’s going on.”

Interaction analysts are interested in the constitution of social order and organization, arguing that “both intersubjectivity and the social order visible in coordinated action are accomplished through ongoing, moment-by-moment social and cognitive work; participants display to each other their understanding of the events
they are engaged in as part of the process through which these very same events are performed and constituted as social activities” (Goodwin & Duranti, 1992, p. 28). Interlocutors are acutely aware of the complexities and demands of conversational work, which becomes apparent through fine-grained analyses of their talk and an emic perspective of the social and institutional contexts.

Analysis of interaction still needs to go beyond the micro-analytic level to understand action at multiple timescales. Ethnomethodology has come to be associated quite strongly with the field of conversation analysis (CA) (Goodwin & Heritage, 1990), which emerged from the broader ethnomethodological tradition with a strong focus on language in face-to-face conversation. While I am influenced by work in CA, I am not constrained by the field’s particular approach, which tends to be somewhat decontextualized and strongly linguistic with a textual analysis approach.

I therefore also draw on literature from the linguistic anthropology of education (Wortham, 2006, 2008; Wortham & Rymes, 2003), which grounds analyses in communicative exchanges while going beyond a micro scale through discussions of the cultural production of identity. Use of linguistic anthropology in education provides insight into sociocultural categorization through particular ways of acting and interacting, which is intimately connected to the learning process. Furthermore, “close attention to naturally occurring speech can provide insight into central processes such as learning and socialization” (Wortham, 2008, p. 37) by looking at linguistic patterns in use, connecting micro to macro level phenomena.
Literature Review

Youth today find themselves at a juncture in society, technology, and education unparalleled in recent history (Davidson, 2011). As their schooling experience has tended to centralize around standardization towards instructionist (Sawyer, 2003) high stakes exams, resulting in a formalization of expected literacy and learning practices through the homogenization of official learning outcomes, their out of school literacy and learning practices have moved towards personalization, specialization, and heterogeneity through engagement with digital media (Ito et al., 2010). Such a shift highlights conflicts between different academic and “popular” theories of learning that, as it happens, have come to a head as the Internet gains ubiquity. It is also a period of rapidly increasing diversity and heterogeneity among the student population (The New London Group, 1996) - this is no accident, as policies like NCLB respond directly to a perceived “crisis” in education (Gee, 1991). Such a shift is inscribed in the media practices of students, further complicating the state project of standardization. Rapid transformations in the ways youth in particular consume media has led to numerous quandaries, concerns, and opportunities. Significant anxieties exist surrounding digital technologies as making youth lazy, illiterate, aggressive, self-absorbed, and withdrawn. Many connect declines in student performance and competitiveness to the rise of digital media in young peoples’ lives.

My research explores the potential of new digital media within learning environments to have positive impacts on learning through classroom talk and interaction, not just in a “virtual” domain or product. Significant opportunities are
afforded within education at our historical moment by these artifacts (Gee, 2010) - Internet connected desktop computers, laptops, tablets, smart phones, etc. Ironically, youth populations most in need of transformations in school - such as the Latino adolescents at the focus of this study - are the least in a position to benefit from new digital media within schools. Resulting is a gap in both opportunity for educational improvement and in research literature.

As working class and minoritized youth are increasingly left behind by educational reforms, a technology-infused curriculum holds promise for building on their strengths and enhancing their 21st Century Skills. However, uneven access to new digital media in and out of schools both perpetuate the digital divide and an achievement gap (Gee, 2004). While Hispanic youth have pioneered practices such as texting and have carved out spaces online (Ito et al., 2010), adoption of digital technologies in schools has lagged. This is not, however, the case everywhere. Sites, such as the one for this research where computers have been adopted in schools with low-income minority youth, provide an excellent testing ground for the effectiveness of new digital media in promoting, expanding, and enhancing learning. They are essentially ongoing experiments where a researcher can take part in the innovation, document its successes and struggles, and analyze what transpires.

The innovations consist of using technology I describe here as “new digital media” (e.g. Gee, 2010) that require and give rise to digital literacy practices (e.g. Mills, 2010), potentially as part of project based learning curriculum. This includes a wide range of technologies and practices, such as recording, editing/remixing, and
uploading (e.g. to youtube.com) video; linear (e.g. Sliderocket.com) or non-linear (e.g. Prezi.com) presentation design; digital cartoon (e.g. Xtranormal.com) or comic (e.g. Chogger.com) creation; use of social media (e.g. Twitter, Facebook, Instagram, etc.) to augment or create discussion; and so on. These are basically part of Web 2.0 - applications that facilitate participatory information sharing, interoperability, user-centered design, and collaboration (Lankshear & Knobel, 2007). In contrast to what was available only a few years ago, these are largely free, social (to some degree), and sophisticated online websites/applications. My research seeks to add to the literature on what “new and multiliteracies do for children and youth, both in relation to school learning and to other forms of social and cultural development” (Moje, 2009, p. 358).

**Methodology**

**Connective Methodology**

The study methodology was formulated around following what Latour (1993) describes as:

> An Ariadne's thread that would allow us to pass with continuity from the local to the global, from the human to the nonhuman. It is the thread of networks of practices and instruments, of documents and translations...In following it step by step, one never crosses the mysterious limes that should divide the local from the global...No visible or invisible hand suddenly descends to bring order to dispersed and chaotic individual atoms. The two extremes, local and global, are much less interesting than the intermediary arrangements that we are calling networks. (p.129)

ANT, despite the “T” in the acronym, has been described as a methodology rather than a theory. In this study, I utilized a particular research methodology to pay greater attention to the material semiotic assemblages in which digital literacy events unfold and thereby captured interaction that may otherwise escape standard
ethnography and video analysis. This view also leads me to acknowledge the agencies of the very instruments used in the enactment of our data as we capture it. Consistent with a “performative” (Barad, 2007; Law, 2012) conception of literacy practice, the so-called subjects and ‘objects’ of our research are always and already entangled with the very apparatuses (cameras, recordings, software, etc.) used to record, or rather represent, the phenomena in question.

Drawing from this performative conception of literacy practice, digital literacy events should be treated as assemblages, requiring disentanglement and reassembly using appropriate methodological tools and techniques. It is not just students and research subjects who are entangled in networks and who must negotiate agency with other, equally agentive elements, but researchers themselves are not exempt from this ontological commitment. Researchers form essential parts of the assemblages on multiple ontological levels as participant observers, instruments of data generation, analyzing subjectivities, and so on. A vital aspect of research analysis means turning the lens back on the researcher and research process, not to theorize ourselves out of the results (by adjusting for “researcher bias” for example), but to locate our own material participation and intersubjectivities as essential to the phenomena themselves. The first article in this dissertation has such a focus.

I am therefore renewing a call for an ethnography of literacy practices that goes beyond the exoticitization of digital media practices (Leander, 2008) and understands them within their everyday, quotidian context. As such, I work toward “a methodology for understanding digital literacies as flowing with and interconnected to streams of
other literacy practices, material culture, traditional media, movements of people, identity practices, and the social construction of technologies” (p. 34). A big part of such connective ethnography is examining the convergent media ecology (Ito et al., 2009, p. 26) rather than isolated affordances of the digital media. While much research on digital media, the Internet in particular, sees the “online” as “virtual” versus the offline “real” world, such a binary is problematic in that they establish a priori answers to new, interesting, and poorly understood digital literacy practices and seem to represent increasingly outdated models of Internet use. This gap gives rise to my interest in the places where the online slips into offline, where the virtual transforms the real. In this sense, my approach is connective ethnography (Leander, 2008).

**Background**

The fieldwork for this research took place during late 2011 until May 2012 in a large, majority Mexican American school district in a major Southwestern city with a highly publicized technology focus, including a 1-to-1 laptop initiative. During the undertaking of this fieldwork, the initiative was in its second year of being rolled out for 6th graders, although the previous year the school had taken until well into the year for the laptops to be distributed. As an example of the top-down organization and policy climate, most schools had adopted the *Success for All* reading program, a highly scripted program intended on raising standardized test scores.

The primary research site was a Title 1 middle school selected based on its project based learning approach, supportive principal, and relative success in integrating laptops. Through professional contacts, I was connected the teacher of 6th grade
language arts with primarily low-income bilingual Latino students. I chose to work with 6th graders since, in my years of working with middle school students across the Americas, I found them to be the most open in their social practices and sitting in a fascinating place between childhood and adolescence. The specific class was chosen largely due to timing. There were two full hour-long classes of reading and language arts. During each class, the teacher generally enacted separate but related curricula, although sometimes there was significant crossover. The class periods were separated by lunchtime when students would typically mill about in the classroom using their laptops for informal purposes and socializing. This juxtaposition of informal lunch between formal class times provided a rich opportunity to examine ways students interacted with digital media and moved between different interactional spaces.

Participants. The teacher of the class, who I call Mrs. Jones, was a White middle class woman in her 40’s with 10 years of teaching experience. The focus class was made up of 24 students: 21 Mexican-American, one Asian-American, one White, and one African American. Mrs. Jones considered the class academically “low” given their overall levels of academic literacy and resulting from the informal tracking system of the school in which students were grouped into classes according to academic performance. The students were nearly all of low socioeconomic status, immigrants, and classified as English Language Learners at some point.

After the first few months of data collection, the study came to focus on a group of girls, three Mexican-American and one Asian-American. However, I continued to collect data on other students in the classroom. I occasionally followed some of the girls
into their Social Studies classroom for additional perspective on their academic and informal digital practices. I interviewed, worked with, and recorded whole class lessons of the Social Studies teacher for potential comparison. Such additional background provided a basis for better understanding dynamics within the focus classroom. The technology integration curriculum coaches – both on-site and from the district office – also participated in ongoing discussions and were interviewed. I frequently recorded the local coach in meetings with teachers and interacting with students.

**Data.** The data were gathered 1-3 times per week in 2-4 hour visits for eight months, with the frequency of sessions increasing towards the end of fieldwork. Data consist of participant observation field notes, audio recorded interviews, digital photos and scans of work products, class assignment files, video recordings of whole class and small group interactions, and student webcams video with videos (screencasts) of ongoing computer (see Bhatt & de Roock, 2013 for additional details). The detailed field notes combined with collections of videos ended up as the central data in the analysis given my social practice perspective, although the other data were valuable for triangulation and contextualization.

The typical setup on a given day was to start as many screen-in-screen webcam/screencast recordings of individual students as possible, which I would stop and save onto a USB drive at the end of the class time. Students often collaborated in making sure the data was preserved. I would identify a group of students with their screens being recorded to focus on for pairing with wide-angle recordings of the small group. At first I rotated these paired recordings around the classroom and eventually
came to focus more and more on the case study peer group. The density of the data was high, since a given recorded moment has corresponding overlapping video data along with information like keystrokes and mouse clicks. Approximately 155 videos were captured over the course of eight months.

Transana (Woods & Fassnacht, 2012) was used for analysis as it was developed specifically for the type of analysis I was undertaking using simultaneous video files for conversation analysis style transcriptions. I managed the video files in Transana, organizing them chronologically and grouped by session. The software allows for the syncing of multiple videos files for transcription and for multiple transcripts to be associated with a given video (see Woods & Dempster, 2011, for further discussion). Keyword labels on video files and coding of video segments helps select clips, but ultimately (given the interaction analysis bias of the developers) analysis within Transana is most easily done on a transcript level.

**Conclusion**

While much debate reigns over what new digital media is doing to young people, my research explores what youth are doing with digital media and ways designers and educators can maximize productive student engagements with digital tools and communities. This work brings learning sciences and literacy research together in new ways with the intent of pushing both fields forward through digital literacy focused design-based research. Through close, situated analyses of student literacy practices and collaborative design of new educational models, my research seeks scalable and measurable positive impacts on classrooms and marginalized youth. I therefore close
each article with implications for practice based on their findings. I believe such a connection between theory and practice to be essential in extending a robust perspective on literacy.
CHAPTER 2: CONCLUSION

“In civilizations without boats, dreams dry up, espionage takes the place of adventure, and the police take the place of pirates” (Foucault, 1986, p. 9).

Heterotopia is a somewhat elusive term Foucault (1986) used to describe “other spaces” – counter-sites “in which the real sites, all the other real sites that can be found within the culture, are simultaneously represented, contested, and inverted” (p. 3). They are similar to utopias but distinct because they can exist in the real world. Foucault describes the boat is the ultimate heterotopia because it is a place without a place yet with infinite possibilities open to it. In my research, I uncover powerful but fleeting of heterotopias in literacy events that occur within classroom bounds but across boundaries actively constructed by students themselves. This conclusion attempts to briefly describe, theorize, and draw implications from the key findings of literacy practices observed. I discuss methodological implications of a connective ethnography approach, the ways integrating technology into the classroom was essentially a digitizing of the status quo, how students actively carved out a classroom underlife to may possible an array of sub-rosa digital literacy practices, and ways educators can leverage and strengthen such digital funds of knowledge (Gonzalez et al. 2006) rather than suppressing such heterotopic possibilities.

Summary of Findings

Connective Ethnography

I have found that the realities of complex, fluid, and extended digital literacy
practices demand a connective approach that approaches the digital and quotidian as operating in a single ecology. This is needed for “understanding digital literacies as flowing with and interconnected to streams of other literacy practices, material culture, traditional media, movements of people, identity practices, and the social construction of technologies” (Leander, 2008, p. 34). As such, my methodology combines a computer-eye view with more traditional ethnographic and video analysis methods to follow actors in online/offline practices and networks. The combination of data capture sources allowed for a more thorough analysis of what was happening in the classroom.

One phenomenon of interest from a practical and methodological standpoint was the case study students’ interactions with the research instruments. In their co-construction of a classroom underlife, the girls enrolled the gaze of the cameras and audio recorders to negotiate the boundaries and audience to their activities. They took an active role in negotiating amongst themselves what was to be seen/unseen or heard/unheard. Particular interactions were deemed by the girls as acceptable as data but not for the teacher, other interactions as unacceptable for anyone, and other acceptable for both teacher and researcher. The predominant approach in interaction analysis is to ignore, attempt to mitigate, or expect the fading of such awareness (Caronia, 2015). I argue that such references to and interactions with the research process are opportunities for deeper understanding of participant meaning making practices.

**Material Semiotic Literacy**

**Digitizing the status quo.** During fieldwork and in analyzing the data, I found
continuity between the classroom’s standard participant structures (Philips, 1983) and curricular organization around standardized test preparation using technology. In other words, in integrating laptops the approach to literacy and learning was largely undifferentiated from a standard transfer or instructionist (Sawyer, 2003) model of learning. In this regard, the use of the laptops was somewhat interesting, but the status quo of learning remained unchanged. Laptops were used to facilitate the use of worksheets and, in the view of the teacher, to improve engagement with otherwise unengaging tasks. Such an approach has been described as “digitizing the status quo,” contrasting the unfulfilled promises of technology to transform education with the realities of their often mundane and limited uses in standard curricula. Interestingly, the more engaging and novel activities within Mrs. Jones’ classroom were done without the use of the laptops, indicating that their presence may have had a negative effect on her practices as a teacher.

Engagement with technology in Mrs. Jones’ classroom was highly structured, predefined, and restricted, which was also keeping with a discourse of control and purposeful use of technology she enunciated. In interviews, Mrs. Jones often referred to the power of technology to engage students and keep them on task. This discourse was inscribed and reinforced by the panopticon-like (Foucault, 1977) surveillance of the Vision classroom management software. It was also true in classroom projects like the “Pawsitivity Cats” Glogster digital poster contest Jen and Marta won. As part of the project and in preparation for standardized tests, the teacher enacted a unit based around persuasive writing with a slow progression to 5-paragraph essay. The
computers were effectively used as word processors and occasionally as dictionaries. There was a yearlong focus on teacher-defined issues, including animal welfare in students’ community, which was a clear cultural disconnect. Mrs. Jones experimented with putting into effect her experiences facilitating digital storytelling workshops, but without the community aspect.

In this sense, classroom technology use continued an estrangement from situated learning practices (Lave & McDermott, 2002), illustrating how, while we may speak of affordances (Greeno, 1994) of particular modes or technologies, we can’t predict how artifacts will be used as embedded within a specific context. Technologies, understood as social practices in themselves, are constrained and/or enabled by institutions, ideologies, actors – networks of heterogeneous materials. In this case study, the affordances of the laptops and the networked technologies and communities they make available were constrained by a network of factors, from the teacher’s understanding of learning and technology, to the array of policy decisions and student test scores that created a demand for improving performance on high stakes tests district-wide. I argue that understanding this continuity of the status quo despite digitization means examining all of the work undertaken to create and reinforce such an arrangement despite such things as student resistance and non-formal practices with the laptops. In other words, there was nothing natural or inevitable about the continuity; it was planned, enacted, and enforced through material labor.

However, while Mrs. Jones’ practice as a teacher may have been constrained by district guidelines and policy makers, such constraints by no means defined her
curriculum. She consistently acted in ways that displayed resistance to district norms and policies. For example, she found ways of resisting expectations around ELA instruction by using Spanish to support struggling students and breaking up the state-mandated three-hour block of ELA instruction.

**Sub rosa digital literacy practices.** From the “other side” of the classroom, viewed in particular through computer-eye views, I found that students were “on task” and “off task” strategically. There was a pointed blending of formal and informal, a blurring of context. Students appropriated laptops for more situated literacy practices. They were quick to personalize computers through personal and community specific iconography. Their appropriation also entailed creative uses of boring tools, such as what I call digital note passing: Jen and Marta, pretending to collaborate during a lecture, would write notes to each other on their laptop in Word, deleting the previous message and passing the laptop back and forth in silent dialog. While playing online games, students interacted online with strangers, friends, and each other, sometime while in different classrooms. However, most students typically played casual single player games without the affordances of more extended and social games. There were also numerous illicit uses of Facebook; although it was banned and blocked, students were sophisticated at finding work-arounds. I found that informal uses of technology generally perpetuated the digital divide, especially the participation gap (Jenkins et al., 2006), as the students’ engagements with networked technologies were much more isolated and simple than those of their more affluent peers (e.g. Ito et al., 2010).

One marked exception was the four focus girls’ engagement with a celebrity-
themed casual multiplayer online game, *Movie Star Planet (MSP)*. They played at home, during lunch, between classes, and sometimes in class. In the game, the girls created celebrity avatars and worked to level them up through fame points. They engaged in peer interaction, scaffolded learning for one another, created digital content, and expressed their identities in explorative ways. In keeping with adolescent gender socialization, they were able to try on and try out identities within the game while negotiating the identities within their peer group and daily lives. Such situated practices address broader digital literacy and participation skills. Specifically addressing the notion of material semiotic literacy, I argue that the procedural rhetoric (Bogost, 2007) inscribed in the structure and community of *MSP* shaped the peer group dynamics and gender play in the girls’ “conversation” (Gee, 2014) with the game.

These *sub rosa* practices disrupt traditional notions of context, providing a forum for considering the place of boundaries in learning. While it indeed emerged from within a school “context” using sanctioned technologies, it brings together the digital activities and face-to-face collaboration of the girls in new ways and their entanglement with actors far beyond the spatial and temporal confines of their classroom. I argue that the girls co-constructed a classroom underlife in order to give space to personally meaningful literacy practices. In exploring the notion of boundaries in learning, I argue for a more nuanced understanding of the everyday digital literacy practices of minoritized youth and the types of communities of practice that exist in classrooms.

For example, while these interactions allowed for situated literacy practices, such as scaffolding entry into the semiotic practices of the peer and game community,
particular aspects such as the game’s business model and available semiotic resources for avatars were problematic. The “free-to-play” business model served as a mechanism for segmenting the player population by those who had resources to pay for additional access to in-game items and status from those who did not, such as the case study girls. Additionally, normative ethnic and gender norms were inscribed in the avatar creation process, such as limited darker skin tones and only one (skinny) body type available, limiting the ability of the girls to represent themselves within the game and potentially shaping their self-perception in negative ways.

**Implications for Practice**

My hope is that this situated analysis of learning and interaction stimulated by new digital media benefits a number of different groups. Principally, I hope that the students and teacher in the participating classroom benefited from our collaboration and the school district benefits from the findings I provide. More generally, educators and policy makers can benefit from better understanding the ways computers effect classroom dynamics and learning, including with 1:1 computing initiatives for low-income minoritized and immigrant youth. I hope to counter the deficit and remediating approach of policy makers in informing district curricular materials and policies regulating teachers’ curriculum and instruction through empirical data.

This research may also expand the understanding of learning, multiliteracies, and new digital media pedagogy, particularly by mapping out the distributed, situated, and embodied nature of thinking and learning and the way new digital media further extends and enhances such processes within a system, not simply in the individual.
While the research literature on new digital media is substantial and growing, my approach and focus stand to contribute by bringing together interrelated approaches and theory in a novel way; the literature lacks a material semiotic micro-analysis of youth collaboration around and through new digital media, especially an analysis that is connective and ecological. I hope to fill this gap by providing significant nuanced understanding for using participatory, collaborative, and design-focused software to augment individual and group learning environments.

Ideally, use of new digital media in classroom is done through a pedagogy of multiliteracies (The New London Group, 1996) that allows for situated practice, taking into account the “increasing complexity and inter-relationship of different modes of meaning” (p. 78) with an emphasis on multimodal design, which encompasses the interconnectivity of all other modes of meaning. This approach sees curriculum as a “design for social futures” (p. 73) that fits the changing world. Research within classrooms has shown substantial possibilities for improving learning through the use of new digital media, such as the Fifth Dimension (Blanton, Greene & Cole, 1999) and Quest Atlantis (Barab et al., 2005). Fields and Kafai (2009) discussed how English Language Learners were able to construct “identities of proficiency” (p. 4) in online multicultural communities.

Jewitt (2008) detailed projects from around the world involving pedagogy that draw on multimodality and multiliteracies. Drawing on the New London Group, she identified four key factors of these pedagogies: situated practice based on the learner’s experiences, overt instruction to teach metalanguages of design, critical framing to
connect meanings to social contexts, and transformed practices involving students’
recreation and recontextualization of meaning. Leu et al. (2004) detailed principles and
projects involving new digital media and multilingual youth. Based on an examination
of a range of projects, they noted that “technology projects seem to work best when they
present students of diverse backgrounds with challenging, generative tasks that require
them to read, write, and think in new and demanding ways” (p. 18). They also noted
the importance of globalized perspectives that recognize the centrality of digital literacy
practices and multilingualism as part of an appropriate pedagogy. Myers and Beach
(2004) looked at the construction of critical literacy practices using digital technologies
and illustrated specific ways digital tools help students “engage in critical inquiry about
social worlds,” (p. 260) as do numerous other studies (e.g., Beach & Bruce, 2002; Myers
& Beach, 2001; Myers, Hammett, & McKillop, 2000).

I have worked towards conveying specific methodological, theoretical, and
practical implications through my writing. I find that digital literacies are best
understood as emergent properties of interactions between students, teachers, and
technologies as opposed to being determined by specific properties in this network. I
also contribute to the literature on distributed cognition-in-practice. This contests
dichotomies like in/out of school, formal/informal, technological determinism vs.
technological neutrality, global vs. local, and so on. I conclude that teachers should
draw flexibly on student interests and skills to discover and take advantage of
affordances of digital media within their classrooms. This work contributes to our
understandings of digital literacy practices among low performing students, especially with my focus on materiality within a socio-cultural framework.

In the end I hope to impact the ways teachers and administrators are prepared to implement technology in learning environments, which could be much more effective. I hope also to inform the ways that media literacy is taught to youth – so that it draws on and strengthens their everyday practices. Overall, understanding and drawing on their non-formal (out of school) practices should shape pedagogy – whether instruction that strengthens literacy in-school, or media literacy to improve their out-of-school practices.

Finally, this work contributes to the humanization of students whose experiences are often not acknowledged. The complexity and heterogeneity of marginalized students’ language and literacy practices are generally erased, problematized, or seen through a deficit perspective in the discourses of schools, educational policies (including with technology use), and the popular media. In my funds of knowledge approach (Gonzalez et al., 2006) I acknowledge the “low” status of the case study girls in terms of their socioeconomic status and academic labels from the school without letting that speak for them. Rather, their actions – as captured through my research process and represented from an emic perspective – are meant to speak for them without romanticization or essentialization, but towards humanization.
REFERENCES


APPENDIX A: A MATERIAL SEMIOTIC APPROACH TO USING VIDEO ETHNOGRAPHY IN STUDYING LITERACY PRACTICES

As researchers, we know that our research tools influence and mediate our understanding of the phenomena we investigate. We never have direct access to an objective reality that we can represent “as it is” — the act of observation itself changes what we observe. Our presence and the tools we employ become inseparable from the “context” at the same time as being the means for understanding what we investigate. However, qualitative researchers typically discard, ignore, or qualify interactions with research tools, with the dominant claim being that participants will eventually forget about being recorded (Caronia, 2015). Using evidence from a recently concluded research study, I argue that the interactions of participants with research instruments can be examined for better understanding their sense-making endeavors. Participants leverage these research tools to accomplish these very actions under observation. Rather than trying to mitigate such “distortions” or argue that participant awareness will fade away, I view this coproduction of data as an opportunity for further analysis of social practice.

A secondary takeaway is the particular methods I used for gathering and analyzing online and offline activity, namely pairing multiple video views, including video of online activity, to reconstruct interactions spanning the classroom, computers, and an online game world. This extended the research context to interactions with,
through, and around digital media devices combining offline and online audio-video data. Figure 1 demonstrates this reconstruction through software.

Figure 1. Managing, synchronizing, and transcribing video data in Transana of student collaborative gameplay during class time.

To illustrate the ways participant leveraging of research tools in the accomplishment of practical action can provide researchers additional insight, I use an event reconstructed from a recently concluded ethnographic study focused on computer mediated literacy practices in a US, primarily Latino and low-income 6th grade classroom. The school was in the first year of a one laptop per student integration, providing a rich context for emergent digital literacy practices by teachers and students alike. I focused on a multi-ethnic group of girls heavily involved in
playing (often surreptitiously) *Movie Star Planet*, a fashion-themed multiplayer online game. What follows is one specific digital literacy event where one girl scaffolds the use of an online game for another during class with the secret participation of their broader group of friends, collectively coproducing a classroom *underlife* (Goffman 1967) amongst the researcher, each other, and the various video data being gathered. While I further analyze this data later in the article, I reconstruct the event here as a narrative vignette of classroom activity based on multiple data sources in order to contextualize theoretical discussions that follow.

As a loud beep signals the end of lunchtime, a group of girls transition from their open and vocal playing of a celebrity-themed online multiplayer game into a surreptitious activity. While their focal activity remains the same—Jen and Marta creating a new character for Sara who is just learning the game—the organization of their gameplay takes on a distinct character from gaming at lunchtime. While they continue to avoid class-related discussion, their actions while on their laptops display intermittent but consistent awareness of being under observation. They evade the mostly static visual gaze of the teacher from her desk and the intermittent digital surveillance of the school’s monitoring software, through which the teacher can monitor student laptop screens from her own laptop. As they avoid assigned work and play during class time, the girls conceal their gameplay from the teacher by moving over to a desktop computer not under teacher visual or digital surveillance, shushing a girl who questions them too loudly, and opening blank tabs in their browsers to hide gameplay.

In their interactions, also they show consistent awareness of the roaming researcher’s visual gaze, researcher’s audio-video recording with a camcorder, and recordings of their on-
screen activities through their laptops. Throughout the recording session, they stop, start, and negotiate with the researcher about laptop recordings, showing a distinct attitude toward this surveillance, which they know is recording their online activities, their discussion around the laptops, and their faces through their webcams. When Marta tells the researcher to “get a life,” she glances at the camera in mock shock and has a brief repairing exchange with the researcher. When Jen reads aloud Marta’s suggestion to use the password “motherfucker,” the girls laugh uncomfortably. Sara then physically and verbally points to the wireless mic in front of them but her friends plow ahead unconcerned. Marta occasionally glances at both the teacher and into the camera lens, later pretending to feed a snow cone into the camera. Jen is called on by the teacher to conference about her short story and, before closing her computer at the end of class, turns off the researcher’s recording software and saves a file so the data is preserved.

As lunchtime ends, the girls shift frame (Goffman, 1974) into surreptitious gameplay that maintains continuity of their activities while avoiding discovery from their teacher, which would disrupt both their gameplay and the regular routine of the classroom. Considerable effort goes into hiding their activities from the teacher (detailed in Appendix C) but also into negotiating what should be “knowable” and visible to the research instruments. They display constant awareness and control over what should be data. The phenomenon under investigation, the co-creation of a classroom underlife giving rise to personally meaningful literacy practices, is created in part through the “cooperation” of the research instruments as the girls interact with them. For example, the girls employ the camera as a reference for collectively
negotiating the boundaries of the underlife, including what should go said and unsaid, making distinctions between teacher and researcher gaze.

Data is therefore coproduced between the research participants, recording instruments, and the researcher. While many interaction analysis studies make claims about documenting “natural” conversation as participants “forget” about recording devices (Coronia, 2015), in this case examining such co-production contributes to deeper understanding of the girls’ accomplishment of practical action, the carving out of a classroom “underlife” to give space and meaning to their surreptitious literacy practices. All of this highlights video analysis as a “locally and contingently produced” (Mondada, 2006: 1) phenomenon. As microscopes have been understood in the natural sciences (Hacking, 1983; Lynch, 1985), video provides a way to see with rather than through in examining the phenomenon under investigation. In other words, video tools play an active role in the meaning-making endeavors involved, from the interlocutors’ actions to the interpretive process of data analysis.

From a research methods perspective, such a close analysis of student practices across time and (digital/physical) space was possible only through the methodological assemblage shown above in Figure 1 in which multiple videos, including from within student computers, were synced and transcribed for analysis. I unpack and discuss this “innovation” in video research and detail its undertaking to inform future research while demonstrating “the ways the data are collected are intimately tied to the analytic orientation that frames the research” (Heath et al.: 275), in this case a material semiotic approach to literacy and learning. The hope is for researchers to further open up the
“black box” of our research processes. Uniting these dual purposes is the hope that an analytical examination of video ethnographic methodologies should provide some guidance for others who attempt to conduct similar research.

**Situating and situated video ethnography**

**Reactivity**

The use of video in research has been problematized on many levels, typically logistical issues, setups, ethical issues, and so on. I address some of these below and do so more in depth elsewhere (Bhatt and de Roock, 2013; de Roock, Bhatt and Adams, forthcoming). Reactivity, or the researcher’s influence on the research setting itself (Maxwell, 2012), is clearly not possible (or desirable) to eliminate in ethnographic research and is not an objective in my own approach. Rather, reactivity is both carefully planned and an activity for analysis. A careful analysis of the researcher effect on the system is important for a better understanding of the literacy practices: How would practices have differed were I not present? In what ways that I have not taken into account am I affecting the system?

It is worth noting that these are unanswerable questions. Taking this further beyond issues of bias or the observers’ paradox (Labov, 1972) means recognizing that “the very entanglement of the camera and of the action and the very fact that the camera can indeed reinforce and reveal structural elements of the situation and activity (and thus can be enrolled as a resource for the production of its order and accountability)” (Mondada, 2006: 12). In other words, the researcher (of course) and the camera (less obviously) are interlocutors and participants in the accomplishment of
practical action within the practices under investigation; the digital literacy practices and associated actions are coproduced by the act of video recording and presence of the camera. Following Heath (1986) and Lomax and Casey (1998), I see orientation to the camera as a topic in itself, embedded in the youth digital literacy practices as just one element in a broader assemblage from which practices emerge.

Theoretical orientation

I am rooted at the intersection of two particular fields—situated social practice strains within the learning sciences (e.g., Barab and Duffy, 2000; Koschmann et al., 2005; Stahl et al., 2006) and literacy studies (e.g., Gee, 2000; Mills, 2010; Street, 1993, 2003). My general methodological framing builds on notions of ethnography as epistemology (Agar, 2006), which posits an interdependent relationship between theories and methods, and ethnomethodology (e.g., Garfinkel, 1967), both to be discussed. I therefore begin with a theoretical framework based on work that “prioritises the situated and interactional accomplishments of practical action” (Heath et al., 2010: 1) to understand literacy practices. By building on work uniting ethnography and multimodality (e.g., Dicks et al., 2011) with work uniting situated learning and video analysis (e.g., Koschmann and Stahl, 2004; Goldman et al., 2007), this study is positioned at the “bleeding edge” (Woods and Dempster 2011) of video ethnographic research.

Research (and learning) as social practice

The theoretical view I will call situated social practice emphasizes the relational interdependence of agent and world, activity, meaning, cognition, learning, and knowing. It emphasizes the inherently socially negotiated quality of meaning and… also claims that learning, thinking, and knowing are relations among people engaged in, with, and arising from the socially and culturally structured world. (Lave, 1991: 67)
I approach all human activity as a situated social practice, whether students are using digital devices or scholars are using video. In other words, I locate the fundament of both researcher and the researched cognition not as occurring within their skulls but as distributed through emergent communities in ongoing negotiation of meaning and knowing through social participation. Such an approach is in the tradition of my own core field of New Literacy Studies’ applied to the study of literacy events (Gee 2000; Mills, 2010; Street, 1993, 2003), the ethnomethodological underpinnings of video analysis (e.g., Mondada, 2006; Knoblauch, 2012), and Science and Technology Studies scholars’ perspectives on the practice of science (e.g., Latour, 2005; Lynch, 1995a), particularly those revealing scientists’ material visualization practices (e.g., Goodwin 1994, 1995; Lynch 1985b, 1993; Latour, 1986). This approach is distinguished from more discursive approaches to understanding social practice. One important unifying concept among situated perspectives is that “data and evidence [are found] in social relations and the natural worlds that are available to and used by members in a setting” (Roth, 2009: 26).

In my situated social practice view of methodologies, I understand the inseparability of the research process from the epistemological and material orientation of the researcher and the research apparatuses employed, all with their own epistemologies, material interest, and agency. The researcher’s gaze constructs not just the object of knowledge but also the knower (Foucault, 1963). Researcher analytical activities, including visual perception, should be understood as a social and situated action. Like all science (whether self-consciously positivist or not), there are real-world
material implications in the researcher’s constructions of reality and constitutive knowledge production (Foucault, 1980; Latour, 1993). Scientists’ language use is “a set of historically rooted practices having the potential to alter social order and cultural structures of knowledge and belief” (Ochs et al. 1996: 331). I therefore attempt to stay continually mindful of implications for research and implementation of interventionist designs; decisions about methodology lead to a particular reality constructed by such research, which in turn influences design decisions around that reality.

**Material semiotics**

Researchers of learning increasingly understand literacy, learning, and cognition as situated (Gee, 2004; Lave and Wenger, 1991), embodied (Gee, 2008; Goodwin and LeBaron, 2011) social in nature (Gee, 2003; Vygotsky, 1978), multimodal (Jewitt, 2009), and intimately tied to technologies (Hutchins, 1995; DiSessa, 2000). I will draw on all of these approaches without dwelling on their theoretical underpinnings (with the exception of material semiotics and literacy) given that they are generally well understood and accepted among qualitative researchers.

There is a strong post-structuralist bias here. When approaching human activity, like literacy practices, without presumptions about the primacy of any given actor or the boundedness of any ontology, many taken-for-granted categories and assumptions do not hold up under close empirical scrutiny. In other words, close investigations of a given object or phenomenon will always reveal the lack of “natural” or a priori stability in the world, but rather their ongoing negotiation and construction by actors. This is not unlike the ways social theory approached (and continues to approach) class, gender,
race, etc.—categories that hold salience in everyday discourses but not in our lifeworlds, especially those of us constantly conscious (and made conscious) of our own hybridity. The emerging subfield of whiteness studies (e.g. Kendall, 2012) is one newer example. Such categories melt away under close examination and others do as well, especially dualisms, once the black boxes are opened up.

Material semiotics is an umbrella term for methods that maps social relations as both material and semiotic. Actor Network Theory (ANT) (Latour, 2005) originated from the field of Science Technology Studies (STS) in examinations of knowledge creation processes and design in scientific and technical fields through empirical ethnomethodological and ethnographic methods. It is a post-structuralist-influenced “non-representational” approach that seeks to contest dualisms, notions of epistemology, and thinking about ontologies. In the last 20 years, ANT has been taken up in a multitude of fields, including education (Fenwick and Edwards, 2010; Nespor, 1997) but only in limited ways by literacy researchers, with the exception of some recent work (e.g., Bhatt, 2014; Bhatt and de Roock, 2013; Leander, 2008; Leander and Boldt, 2013).

**Researching literacy**

New Literacy Studies (NLS) researchers, opposing a psychological and cognitive view of literacy, look at literacy as situated social practice. Literacy, in this view, is a social rather than simply individual practice, a socio-cultural rather than simply mental achievement, and understandable only within a broader range of contextual factors rather than isolated mental processes (Gee, 2012). This contextually and socially
situated way of understanding literacy led to the view that there exist literacies rather than just a singular literacy. NLS scholars Lankshear and Knobel (2007) defined literacies as “socially recognized ways of generating, communicating and negotiating meaningful content through the medium of encoded texts within contexts of participation in Discourses” (224). This definition is meant to encompass the complexity of literacy and the multiple modalities it involves, with an emphasis on discursivity and the centrality of text, following the tradition of the New London Group (Cazden et al., 1996; Leander and Boldt, 2013).

A complementary definition more compatible with the situated perspective I advance is that of Scribner and Cole (1981), who discuss literacies as “socially organised practices [that] make use of a symbol system and a technology for producing and disseminating it” (236). Their emphasis is on social organization and practice along with the related semiotic and technological systems. In both cases, the lived experiences and unfolding interactions of communities are key—both the localized, contextual, more individual instantiations of literacy practices and the broader social organization and discourse communities that form a broader assemblage (Latour, 2005) from which meaning can emerge. My own perspective is further informed by STS and ethnomethodologically influenced socio-material approaches to literacy practices (Bhatt and de Roock, 2013; Gourley and Oliver, 2013) that understand the “social” to also include the material (such as laptops, desks, paper) as interactional participants rather than mere mediating tools or artifacts.
Digital literacies – literacy practices that involve digital technologies – should be treated no differently. Although some research on digital literacies increasingly acknowledges online "lives" as inextricably connected to offline worlds (Leander, 2008; Fields and Kafai, 2009), other research on digital activity largely neglects to treat such connectivity theoretically or methodologically as occurring in a single ecology. Given how literacy practices increasingly involve digital technologies and environments, this is problematic. Perspectives should be realigned to consider the complex interplay of online and offline, human and non-human interactions (further detailed in Article 2 of this dissertation). Likewise, research methods and methodologies need to undergo an equivalent examination, both “outward” in considering the ways data are generated and analyzed, and “inward” in reflexive considerations of our own practice as professional researchers.

**Ethnography**

Such a focus on the play-by-play unfolding of learning demands an appropriate methodology. Whereas ethnographic approaches seek an insider “emic” perspective of interlocutor and community realities, ethnomethodology seeks to uncover the perceptions and everyday knowledge and working rules on which people accomplish every day typically mundane social action. Realizing that “ethnography is the partial study of a planet that is already studying itself” (Jackson, 2013: 28), I see these as complementary. Ethnography has often been seen as much more than a method, but rather as an epistemology and logic-in-use (Green et al., 2012), “as a non-linear system, guided by an iterative, recursive and abductive logic” (309) following Agar (2006). My
own approach is heavily influenced by connective (Leander, 2008; Fields and Kafai, 2009) and multimodal (Dicks et al., 2011) ethnographic approaches, striving for an ethnography of computer use that goes beyond the exoticization of digital media practices and understands them within their everyday, quotidian context.

**Video analysis**

Video analysis, or videography (Knoblauch and Tuma, 2011), has only recently coalesced as a particular methodology (Knoblauch, 2012), gaining momentum especially over the last 10 years, although it builds on work in visual anthropology and related fields. However, the use of film in social science research has deep roots tied to the advent of photography and motion pictures, including its use in scientific (and pseudo-scientific) research (e.g., the works of Muybridge, Marey, and Braune discussed in Heath et al., 2010) and in the social sciences, anthropology in particular (e.g., Bateson and Mead, 1942). The potential of using film for both documenting and analyzing social practices was apparent, although relatively slow in adoption. There are many affordances of video-recorded data for analyzing social interaction, and these have been discussed in depth for some time (e.g., Edwards and Westgate, 1994). Mondada (2006) identified the advantage of video in organizing what Garfinkel (1996) described as “another next first time,” emergent social practice arising from immediate social and material organization and the interlocutors’ own past experiences. Additionally, video provides a means for analysis of social practices through ease of sharing, referencing, and collaborative discussion.
The definition advanced by those describing themselves as video analysts has roots in ethnomethodologically inspired workplace studies, including those detailing how technologies feature in day-to-day conduct and interactions associated with and inseparable from ethnographic fieldwork (e.g., Suchman, 1987; Heath, Knoblauch, and Luff, 2000; Heath and Luff, 2000). The methodology is typically used with conversation analysis (e.g., Psathas, 1995) and/or multimodal analysis (e.g., Jewitt, 2009; Kress, 2009; O’Halloran, 2004). The divergent roots of these two approaches (sociological ethnomethodology and systemic functional linguistics, respectively) are not without contradictions (Anderson, 2013), but some work has been undertaken to resolve them (e.g. Kress, 2011).

**Syncing multiple video streams**

For several decades, researchers have been combining multiple video views, including of computer screens, to later piece together for analysis of the social practices under investigation. Bigum and Gilding (1985) is an early example of synchronously capturing students’ writing, movements, and talk around a task; it required two monitors, a video mixer, a video tape recorder, and a means of splitting the computer video signal. More recently, researchers have been utilizing webcams and screen capture (e.g., Geisler and Slattery, 2007; Asselin and Moayeri, 2010), including combining them with video ethnography (e.g., Bhatt and de Roock, 2014; de Roock, Bhatt, and Adams, forthcoming; Garcez, 1995; Hindmarsh et al., 2000).

Video holds great potential for use in educational research. Zuengler, Ford, and Fassnacht compared the potential of examining interaction in classrooms through
videotape to improve pedagogy to the transformative influence of van Leeuwenhoek’s microscope on the life sciences, where the making visible of the “previously unseen details of an unimagined world” (1998: 28) resulted in a revolution in the field of biology. Video has been used in literacy research, although there exists little literature discussing methodological implications. There is discussion that is more extensive regarding using video in LS (e.g., a full edited volume from Goldman et al., 2014).

**A situated view of research design**

Research is a series of mundane decisions, often bad ones that are only later corrected or erased from the record, but ones that are crucial for understanding the way data were generated and findings were produced. Luff and Heath (2012) discuss how even the most mundane choices made during data collection can impact the subsequent analysis. These mundane choices are therefore of interest in examining the process of research itself from a situated perspective.

**Background**

The research project examined the kinds of practices exhibited by students when interacting with, through and around laptop computers in the classroom. This research emerged from an interest in examining in-situ language use around new digital media in learning settings, having gathered and analyzed data of my own children grappling with science concepts, and using computers and an iPad at home, developing some of the same technical and analytical methods later used with this research study.

Research was primarily conducted in a 6th grade language arts classroom at a primarily Mexican-American, Title I public middle school in the Southwest USA. My
own experience teaching middle school with Latino and Native American students, and substantial experience in Latino/Latina and Latin American educational contexts, informed my choice of schools as well as my choice of 6th graders as both students and research participants. Additionally, the school stood out from district schools in performance and technology use; similar schools simply did not have significant infusions of digital technology into their curricula. The school was in the second year of implementing a 1:1 laptop computing initiative with 6th graders. Teachers, particularly the one I chose to focus on, were very interested in utilizing the laptops in the classroom within the project-based framework of the school, making it an ideal site for an ethnography of computer use. I selected a single 6th grade classroom made up of a white middle-class female teacher and 24 students: 21 Mexican-American, one Vietnamese, one White, and one African American. Within the semi-formal tracking system of the school, the teacher considered this class to be an academically “low” class and the students were nearly all of low socioeconomic status. This paper focuses on a group of four girls: three Mexican American and one Vietnamese.

Data collection

The data was obtained through long-term, participant observation (Blommaert and Jie, 2010) of classroom activities and interactions one to three times a week for eight months, with more frequent visits towards the end of fieldwork. As I had begun to take seriously Latour’s (1993, 2005) frequent appeal to follow the actors themselves in ethnographic research to unearth emergent networks of relationships and gain insight into human activity, I realized this included following students in their writing.
processes and other actions on their computers and online. It also meant including the laptops themselves as interactional participants. Thus, my primary orientation gradually switched to multimodal ethnography (Dicks et al., 2011) that included a screen capture setup, aiming for maximum data density of a given practice. This meant the time it took to capture rich multimodal data (acquiring technology, setup, monitoring, saving, processing, managing, etc.) along with trying to gather ethnographic field notes left little time for robust instruction and collaboration. I became more of a classroom helper within the teacher-driven curriculum and more of an orientation to capturing naturalistic interactional data, in tradition of action research and participatory ethnography (Glesne, 2006), than the results of a specific intervention.

Thus, for the bulk of the fieldwork, I participated in implementing the teacher’s curriculum and observing how participants interacted with each other, made use of digital technologies, and engaged with the course material along with “off-task” behavior. As a classroom ethnography modified by dense micro-ethnographic data analysis, I used an in-situ research methodology (Barab et al., 2001) looking beyond simplified outcomes at what actually happened in the complex unfolding of teaching and learning within a continually evolving context (Koschmann, Stahl, and Zemel, 2004).

*Types of data*

Data included field notes documenting teacher and student actions and interactions, usually taken at the opening of class and then retrospectively after the class ended. I was frequently caught up helping or in discussions with the teacher or
students. I conducted frequent interviews with the focus teacher, later with each of the students enrolled in the research, along with the technology curriculum coaches on the school and district level. However, video data became increasingly central to developing a thick description (Geertz, 1973) of ongoing classroom activity, in part due to my orientation towards a situated learning and practice approach but also because insights of ongoing activity occurred more frequently when reviewing all acquired data.

Additionally, the types of phenomena that emerged as most interesting and salient were those only suited for capture by video. While I began by gathering data on whole class interactions and a range of students, over time I selected a focus group for case study, a peer group of four girls: three Mexican American, and one Asian American. Selection was based on potential for looking at more interesting and interactive digital literacy practices. I also followed the peer group into other classrooms in order to get an idea of how they engaged with technology and each other for comparative purposes. I also observed and interacted with the focus (and other) students in non-classroom spaces on occasion, such as lunchtime. Observation and interaction data were gathered through field notes, conceptual memos, and digital recordings.

After students became accustomed to and trusting of my presence, digital video was taken at least once per week through a combination of video camera and screenshot/webcam/audio capture through computers being used (Bhatt and de Roock, 2013). The result was a rich, multimodal stream of data simultaneously capturing students’ interactions with each other (speaking, gesturing, positioning) and
real-time interactions with the computer (typing, deleting, navigating). I collected approximately 155 videos to be viewed, transcribed selectively, and analyzed throughout the project.

**Methods of gathering data**

I captured video data using a tripod-mounted camcorder combined with recordings from student computers. I used a professional grade HD camcorder with flash storage and two audio inputs that recorded separate channels of audio, where I plugged in a boom mic and a wireless mic. I paired multiple and simultaneous screen-in-screen webcam/screencast recordings of individual students with wide-angle recordings of the small group. This allowed for a complex data set and detailed analysis. Occasionally, students in different classrooms were captured interacting online while interacting with their peers around them. Issues raised by Luff and Heath (2012) regarding camera angle were present and only partially resolved through multiple simultaneous recordings. The main data source transitioned from the tripod-mounted camera to the screencasts, although these recordings were most useful when combined with the camcorder.

Due my theoretical orientation, I was less interested in this type of work output data than I was in examining the ongoing collaborative accomplishment of the assignments captured by the video data. In the interest of contextualization (Blommaert and Jie, 2010), I gathered additional data to provide background and participant attitudes needed to contextual classroom digital literacy practices. Ongoing conversations with students, the student sub-group, the teacher, the technology...
coordinator, and the principal were documented and audio-recorded when possible. I carried out in-depth ethnographic interviews with all participants including students, sometimes in groups. The interviews, which were audio recorded, were open-ended and conversational to evoke more “naturalistic” language data. I collected class assignments produced by students, including paper-and-pencil work (worksheets, graphic organizers, notes, etc.) used before, during, or after the computer work. I preserved digital media designs as close to the original as possible (screenshots, file exports, etc.), although aspects were likely lost in the “translation” from their original form or setting. In such cases, I included notes in the file metadata.

**Data analysis**

In the process of data management and analysis, I made decisions that reflected theoretical orientations, issues of practicality, and the unique “demands” of these types of data (Luff and Heath, 2012). For example, the screen capture software (Blueberry Flashback Recorder) allowed for the screen-in-screen format, conflating the screen recording with the webcam and audio recording along with additional data (e.g., keystrokes, mouse clicks, etc.). Important methodological decisions included the placement of the webcam image, quality of the video and audio chosen, and privileging of modes.

Managing large amounts of video data was an important part of the analysis process. Series of individual videos were organized using Transana (Woods and Fassnacht, 2012) by time and date. In terms of analysis, there is risk of a type of data saturation brought about by an overwhelming amount of data; the data from this study
included 155 videos, many lasting an hour or more. Examining such video was rather like conducting a second ethnography, this time viewed from positions where I was not present, including within student computers. I used a “tree-wise and forest-wise” approach (Moss et al, 2009). That is, in addition to a focus on rich examples, I sought to understand the ways micro-interaction compared to broader activity in the classroom (Barron, Pea, and Engle, 2013).

While reviewing in Transana, I summed up each episode in a "transcript" with associated timestamps. With Transana’s keyword option, I connected practices of interest to generate clips in a process mirroring a grounded theory method (Charmaz, 2014) but already constrained by the phenomena of interest formed during fieldwork. This starkly differs with the way coding is often used in other programs, especially when coding categories are predefined or imported. Using Transana’s keyword option, I was able to connect otherwise separate phrases and sections and generate these into clips, thereby facilitating documentation of the iterative analysis. The coding process is especially useful when checking for validation through cross-verification with other sources, like field notes and interviews (Mavrou et al., 2007).

In line with Heath et al. (2010), I eventually selected and viewed repeatedly video clips of approximately five minutes, often from a sequence of interactions. Selections were based on a range of concerns influenced by my ongoing understanding of student literacy practices, observational notes, and other relevant and supporting data (e.g., interviews). I transcribed clips of approximately ten seconds with an approach that matched the type of analysis: Transana to produce traditional vertical
transcripts for conversation analysis and ELAN (Brugman and Russel, 2004) for horizontal, multimodal transcripts. Transcriptions in ELAN adopt multimodal transcription conventions (Bezemer and Mavers, 2011) to account for the host of interrelated behaviours, including gaze, talk around the task, and interactions with materiality. The transcripts are analyzed using conversation analysis (e.g. Goodwin and Heritage, 1990) and multimodal analysis (e.g. Jewitt, 2009) methods; these are related approaches both heavily influenced by ethnomethodology.

Transana and ELAN uniquely allow for the synching of multiple videos files for transcription, allowing me methodological flexibility with complex video data; resulting transcriptions included exchanges available to the interlocutors but with different aspects appearing across multiple videos. Transana also allows for multiple transcripts to be associated with a given video (see Woods and Dempster, 2011). Different transcripts allowed for multiple layers of analyses: field notes, gist of the video, verbatim transcription, a Jeffersonian transcription (Atkinson and Heritage, 1984), or a transcription of the different modalities present, such as gesture, gaze, etc. (Bezemer and Mavers, 2011). The synchronizing of data in this way in Transana was a powerful option that required advance planning.

The coproduction of practice

In one particular instance (discussed in further depth in de Roock, forthcoming), the placement of the camera helps to form the surreptitiousness of student gameplay, which I have argued is part of broader student sub rosa digital literacies (Gilmore, 1986), and the co-construction of a broader classroom underlife (Goffman, 1961). In my
reconstruction of events from various data (see earlier Narrative Vignette), students move from playing *Movie Star Planet* on their laptops during lunch to sitting around an unmonitored desktop computer once class begins to continue playing, collaborating to create a new character for one girl. They are careful to open new tab on their laptops to obscure their gameplay from the teacher’s gaze without leaving the game. With full knowledge, they can operate in secret while the teacher is busy conferencing and they are invisible from the computer monitoring software while on the desktop, they work together quietly and collaboratively creating a character. Throughout this digital literacy event, the girls utilize my presence as an interlocutor as well as of my research tools to make sense of and accomplish their coordinated actions. In two particular instances, brief exchanges occur between the girls about whether the research gaze through the camera (Images A-E) and microphone (Images F-K) posed issues for their activities. In both cases, they plow ahead unconcerned, having learned from working with me extensively that I do not threaten their underlife.

After a few minutes of them moving over to the desktop computer, I notice and redirect the tripod-mounted camera to capture their gameplay. I then move over a wireless mic for more localized audio within the loud classroom (image A).
Figure 2. Marta notices the camera trained on her and assesses its threat to the group’s activities while the rest of the group orients to its presence and Marta’s stance (see “Transcription Notion” at the article’s end for transcription conventions).

As I am walking away to make sure the camera setup is working before joining the teacher for a planning meeting, Marta, the girl playing, playfully mutters, “Hey, Mr. de Roof, please, get a life,” followed by laughter. After quietly saying, “just kidding,” she glances up, smiling, looking towards my location behind the camera. From this sequence, it can be assumed she was referencing my expression to see if I had overheard and possibly clarifying her act of subterfuge to her friends by identifying her unknowing victim. After looking back at the computer, she does a double take, quickly
looking back this time at the camera, which she had not noticed had been redirected towards her new position. Her look at first conveys genuine concern then transitions into mock horror at the direction of the camera, possibly as she assessed the threat posed by the camera to exposing her secretive comment. As her friends collectively orient to the camera’s gaze and my reaction, looking first at Marta’s face, they negotiate concern about the seen/unseen and the heard/unheard together, emerging apparently unconcerned. As I comment about how I have heard so many things from them that I do not know what to pay attention to, they have already moved on to discussing their game again.

Figure 3. After Jen curses, the group negotiates orientation to the camera.

1   (Marta writing down account credentials with marker, "Moviestar")
2   S  I love ()
3   J  Motherfucker.
4   ((Pause [F], then all girls break out laughing))
5   J  hhhe. I'm just kidding. ((Looks past Marta at camera [G], then at teacher [H]))
6   N  Don't sa::y that!
7   N  >Sorry<
Later, as they are negotiating the login for their new character, Marta is writing down “Movistar” with a marker as the header for recording their login credentials. Jen pretends to read it aloud: “motherfucker,” followed quickly by “just kidding.” There is a pause of disbelief while Jen covers her mouth playfully and makes eye contact with Sara (F); Marta throws down her marker, and they all laugh. Marta says, “Don’t say that!”, but quickly returns to her writing. Jen replies, “Sorry,” but without much conviction, although she glances past Marta directly at the camera (G) then up and past Sara towards the teacher (H). She then returns to the game collaboration. Sara, who is typically more worried about staying on task, glances at the teacher nervously (I), then alerts her companions to the presence of recording devices, first pointing to and commenting on the wireless mic (J) and then the camera (K). Jen and Marta ignore Sara,
except for subtle cues and comments from each to drop what we can presume they felt was uncool behavior. For example, while Sara points at the camera, Jen maintains her gaze rather than following her gesture, and then carries on interacting with Marta.

This episode exemplifies the ways the girls enroll the gaze of the research instruments to define the structure and trajectory of their community of practice with its ongoing activity. They debate and collectively resolve (in the favor of Jen and Marta) the ontological status of the camera and microphone as non-threatening and even as collaborators in the surreptitious gameplay and border crossing of classroom norms.

Figure 4. Marta pretends to feed her frozen fruit drink to the camera.

A few minutes later, after bumping the camera tripod while walking by, Marta positions her frozen fruit drink with a spoonful directly in the way of the camera (L), playfully “feeding” the camera (or the imagined observer). This forms a broader pattern of playful behavior between students and my recording devices at times when their
peers are not paying attention. In this case, we can follow Jen’s gaze as she observes the act (L), then laughs as she makes eye contact with Marta, thereby shifting to a shared footing before returning to her game. Ten seconds later, Marta begins repeating the action but then notices she smudged her treat onto the camera lens (N). After Jen questions her about something game related, Marta asks whether they should tell me about the accident, using the frozen fruit drink to gesture at the smudge (O), and Jen agrees. Marta turns towards me and beings walking (P), saying, “Hey, Mr. de Roof? I got, I got some on the thing…”, before I ask her to wait for me to finish speaking to the teacher.

An important part of framing this episode is how it follows the above negotiations of the threat status of the recording devices and (as I have argued) the construction of an underlife.

![Figure 5](image)

*Figure 5.* Marta displays ongoing awareness of being recorded as she stops the recording before logging off her computer.

```
1 J In this, this. There's going to be a chicken. Ki:ng. ((Sitting back down at desk))
2 ehhhe:
3 N Awesome.
4 R ((Jen begins logging off her computer [Q]))
5 Hhe hh hh. () Mister de roof do I exit it out? () [Its go]nna ri:ng.
6 J [What?]
7 ((Jen stops, looks over at researcher, hovers over BB FlashBack icon [R]))
8 R Oh yeah mister do I stop it?
9 (Yes) thanks guys.
10 Can I stop it? I stopped- ((S) audio/video ends))
```
After Jen is called over to work with her teacher for the remainder of class, I restart the recording, which I had stopped when noticing her away from her computer. When Jen and Mrs. Jones complete the conference as class is ending, Jen begins logging off her laptop (Q), hesitates, and asks me whether she should exit out of the recording. Marta echoes her and I affirm and thank them. Without waiting for my answer (it is unclear whether she heard my affirmation), Jen then clicks into her menu (R) to turn off and save the recording (S). Note that a full 20 minutes had passed since I started the recording, with nothing else to remind her of the ongoing recording, which demonstrates a consistent level of awareness. She is aware that the recording can be lost otherwise, since it has happened in the past, and I often urged them to be more careful when it happened.

Such participant awareness of and interaction with recording devices provides additional means for understanding their accomplishments of practical action, in this case their literacy practices. Coronia (2015) similarly analyzes a number of participant references to recording devices, in particular after instances of coarse language. She holds that by referring to the recording device, the speakers “assess the recordability of what is going on by differently distributing this property to the behavior under scrutiny…[t]hus they establish an epistemic difference between reality (the recordable) and data (the record), and position themselves as the epistemic authority in charge of such a decision” (153). Such “epistemic authority” of the girls in the above cases serves to establish the boundaries of a figured world (Holland and Lave, 2001) carved out
within classroom space (part of a broader underlife) that situates their digital literacy practices. By co-constructing such a space with each other, the teacher (though remaining unaware of their space), and the research instruments, the girls are able to engage in practices meaningful on a personal and community level.

Discussion

Messy research

Research methods are often designed to smooth away and simplify the messy lumpishness and most interesting complications of the world, in well-intentioned efforts to know them and make things clear…research itself purifies through its enactments. (Fenwick and Edwards, 2010: 144)

Such problematizations of research practices that I share with Fenwick and Edwards draw from Law's (2004) critique of traditional research as an attempt to reduce a "complex, diffuse, and messy" reality to vastly oversimplified (purified, as he puts it) “simple, clear descriptions” (2) and conclusions. Research practices—based in the real-world contexts and resulting in generated data—are complex, composed of a myriad of “mundane” decisions made in the research process, and influenced by particular analytic orientations and goals.

Luff and Heath (2012) have pointed out that advances in digital recordings provides logistical improvement and increased detail of video data, including the ways different video data sources allow for improved access, details of ongoing activity, and the ability to better perceive the interrelatedness of activities across time and space. However, the basic issues in video analysis remain, namely that the researcher “still has to consider the ways in which these multiple views resonate with the perspectives of
the participants being recorded, how what is visible in the data is visible to them…status of additional resources gathered to augment a study and how the analysis of these can be best integrated with the video recordings” (276).

Although the combination of video recording with screen capture techniques may help alleviate some of the methodological challenges in using video recordings alone for data capture and analysis, the capture of simultaneous renditions in the way I propose itself poses new methodological challenges. The complete workflow involved in the data gathering and analysis must be kept in mind in research design, which can be difficult since challenges arise during the research process itself. In selecting software, it is important to note that epistemological and methodological assumptions are built into all data capture and analysis software. While the chosen software should match the objectives of the research, there are a myriad of biases with the software that should be interrogated throughout the research process.

Although the data have been cleanly represented variously through images, a vignette, and transcripts (Bhatt and de Roock, 2013; de Roock, Bhatt, and Adams, forthcoming), the reality of the research setting and the research and analysis process are much more complex. The transcriptions used for analyses were generated using consecutive camcorder video recordings, multiple simultaneous screen capture from student laptops, researcher field notes, and an audio recording. As the researcher, I was only marginally aware of what was happening at the time, although thinking ahead to capturing particular kinds of practices—surreptitious use of classroom laptops for personally meaningful social participation within a fashion-themed online multiplayer
game—resulted in the capture of data that later led to the piecing together of data for reconstruction of the literacy events.

**Representation and purification**

The advantage of video data is its ability to capture such messiness to a large degree, which can be further expanded to include yet more complexity, as in this case study. However, like all research, the process of video analysis is necessarily a purification process. At each stage of the process, decisions are made on what to focus and thus what to exclude, ways to simplify and block-box. This occurs from the macro level, where a research site is selected, down to the micro, where specific modalities are chosen for analysis. Law (2004) argued that since the world itself is “messy, unknowable in a regular and routinized way” (596–7), research should also be represented as both messy and heterogeneous, since it is in practice. He suggests that social science research is still caught up in centuries-old Enlightenment thinking that sees research and method as a set of procedures for discovering, depicting, and reporting on a given reality, rather than co-producing that reality. He describes method as a “bundled hinterland that stretches through skills, instruments and statements (inhere enactments of previous methods) through the out-there realities so described, into a ramifying and indefinite set of relations, places and assumptions that disappear from view” (45).

As a scholar analyzing a complex phenomenon—learning—in complex and rapidly transforming contexts, primarily technologized classrooms, I grapple with how to represent such a complex reality. The choice of video analysis emerged from a belief
that it holds the greatest potential for discovering salient patterns around, analyzing and representing the phenomenon. In this case, it allowed the detailing of a rich classroom underlife involved within and around gameplay, including the referencing of research tools to collectively negotiate such a social space.

**Directions for Further Discussion**

Certainly further discussion is needed here, especially about representation. Like Edward Said, in examining methodology with a “politics of interpretation” at the heart, we should be asking, “Who writes? For whom is the writing being done?” (30). Maori scholar Linda T. Smith (1999) calls for “a critical understanding of some of the tools of research — not just the obvious technical tools but the conceptual tools, the ones which make us feel uncomfortable, which we avoid, for which we have no easy response” (52). As pointed out by feminist Maori scholar Irwin (1992), power lies in who designs and develops the tools of research, and by extension in the interrogation and examination of the tools themselves. Academic writing and research more broadly “is a form of selecting, arranging and presenting knowledge” (Smith, 1999: 255).

**Conclusion**

In discussing the ways the group of girls leveraged research instruments to negotiate the context of their digital literacy practices, I sought to accomplish two objectives. The first was to pass on a particular method of gathering and analyzing online and offline activity; I paired multiple video views, including screen capture, to reconstruct interactions spanning the classroom, computers, and online game world. The second objective was to approach such research as a situated social practice,
demonstrating how participants leverage the research tools to accomplish the very actions under observation. Rather than trying to mitigate such “distortions,” they present opportunity for further analysis of social practice. The examples given from data on one day show various ways the three girls index and interact with research instruments in their accomplishment of practical action, displaying epistemic authority in deciding together what is the knowable by each other, the researcher, and the teacher.

Additionally, I argue that, like the world we live in, the research process is messy and potentially problematic and that, while new approaches to ethnography such as the video analytic methods discussed can address such complexity, others issues are raised in the process. While I advocate the versatile and emergent adoption of new technologies for research, I caution against buying into discourses of progress that labels like “new” and “innovative” entail (Travers, 2009). There are material implications of knowledge construction, such as social policy or, in this case, designs that result from research findings (New London Group, 1996; Voithofer, 2005). Given this, I stress the importance of researcher reflexivity and push for an opening (loosening) of the ways research is discussed that avoids purification, situating the researcher and research tools as participants in the same messy world we are attempting to describe and analyze.

Transcript notation
My transcripts follow a slightly modified Jeffersonian Transcription Notation including the following symbols:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Name</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ text ]</td>
<td>Brackets</td>
<td>Indicates the start and end points of overlapping speech.</td>
</tr>
<tr>
<td>=</td>
<td>Equal Sign</td>
<td>Indicates the break and subsequent continuation of a single interrupted utterance.</td>
</tr>
<tr>
<td>(# of seconds)</td>
<td>Timed Pause</td>
<td>A number in parentheses indicates the time, in seconds, of a pause in speech.</td>
</tr>
<tr>
<td>()</td>
<td>Micropause</td>
<td>A brief pause, usually less than 0.2 seconds.</td>
</tr>
<tr>
<td>. or ↑</td>
<td>Period or Down Arrow</td>
<td>Indicates falling pitch.</td>
</tr>
<tr>
<td>? or ↓</td>
<td>Question Mark or Up Arrow</td>
<td>Indicates rising pitch.</td>
</tr>
<tr>
<td>,</td>
<td>Comma</td>
<td>Indicates a temporary rise or fall in intonation.</td>
</tr>
<tr>
<td>-</td>
<td>Hyphen</td>
<td>Indicates an abrupt halt or interruption in utterance.</td>
</tr>
<tr>
<td>&gt;text&lt;</td>
<td>Greater than / Less than symbols</td>
<td>Indicates that the enclosed speech was delivered more rapidly than usual for the speaker.</td>
</tr>
<tr>
<td>&lt;text&gt;</td>
<td>Less than / Greater than symbols</td>
<td>Indicates that the enclosed speech was delivered more slowly than usual for the speaker.</td>
</tr>
<tr>
<td>°</td>
<td>Degree symbol</td>
<td>Indicates whisper or reduced volume speech.</td>
</tr>
<tr>
<td>ALL CAPS</td>
<td>Capitalized text</td>
<td>Indicates shouted or increased volume speech.</td>
</tr>
<tr>
<td>underlined text</td>
<td>Underlined text</td>
<td>Indicates the speaker is emphasizing or stressing the speech.</td>
</tr>
<tr>
<td>::::</td>
<td>Colon(s)</td>
<td>Indicates prolongation of an utterance.</td>
</tr>
<tr>
<td>(hhh)</td>
<td></td>
<td>Audible exhalation</td>
</tr>
<tr>
<td>'. or (hhh)</td>
<td>High Dot</td>
<td>Audible inhalation</td>
</tr>
<tr>
<td>( text )</td>
<td>Parentheses</td>
<td>Speech which is unclear or in doubt in the transcript.</td>
</tr>
<tr>
<td>(( italic text ))</td>
<td>Double Parentheses</td>
<td>Annotation of non-verbal activity.</td>
</tr>
<tr>
<td>[letter]</td>
<td>Bolded Curly Braces</td>
<td>References an image at moment of capture within corresponding speech or action.</td>
</tr>
</tbody>
</table>

References


The notion of practice guides the way we seek to understand literacy. Instead of focusing exclusively on the technology of a writing system and its reputed consequences (“‘alphabetic literacy fosters abstraction,” for example), we approach literacy as a set of socially organized practices which make use of a symbol system and a technology for producing and disseminating it. (Scribner and Cole, 1981, p. 236)

Much discussion within New Literacy Studies (NLS) since Scribner and Cole’s penning of this particular definition of literacy has focused fruitfully on the sociocultural nature of literacy practices. Such efforts have been followed by more recent discussions about literacy practices arising from transformations in the technologies of communication. While this discussion has resulted in many interesting research contributions on the resulting digital literacy practices, there continues to be a lack of theorizing on the relationship between technology, social practice, and meaning making (Moje, 2009). One major hindrance has been two decades of literature on “‘new literacies” that describes “‘new” practices without making clear just how they are new, except by pointing to the presence of new technologies. Relatedly, literacy researchers generally do not discuss the role of technology, non-humans, and distributed agency in notions of “‘practice.” A number of NLS researchers (e.g., Gee, 2012; Moje, 2009; Street, 2003) have argued that the relationship between media and literacy practices is under-theorized, running the risk of returning to autonomous models of literacy and echoing what scholars like Scribner and Cole (1981), Street (1984), and others were arguing against (Gee, personal communication). In other words, when we start to speak of such
things as Twitter literacy (e.g. Greenhow & Gleason, 2012), there is a danger of returning to associations between a particular medium and its blanket results in the meaning making of those engaging with it.

There is a need therefore to escape such a return to an autonomous model of literacy by locating literacy context bound, but without getting lost in disparate local instantiations of literacies (Brandt & Clinton, 2002). I argue that one way of charting such a course is to understand literacy practices, even the most mundane among them, as achievements of a complex network of actors, both human and non-human, many separated by time and space. Specifically, networks of social actors, semiotic systems, and particular technologies are what give rise to literacy practices. While this is especially evident with digital practices, it has always been true of literacy — including among the Vai that Scribner and Cole (1981) worked with over three decades ago. Examinations that intertwine the concepts of technology and practice are increasingly prevalent in other fields, specifically in material-semiotic approaches like Actor Network Theory and New Materialism (e.g. Fenwick & Edwards, 2010; Latour, 2005) and hybrid agency approaches in language and interaction studies (e.g. Virkkunen, 2006). Approaches of this sort examine all of the elements in a given system that contribute to the emergence of a literacy practice in ways that does not take boundaries and ontologies for granted or assume the primacy of any given element in the system.

The need for or implications of such a shift to tracing the materiality of literacy is not clear based on theory alone. Given that literacy practices are tied to a particular context, an understanding of literacy is furthered only through close examinations of
literacy practices “in the wild” (Hutchins, 1995), in naturalistic setting through empirical examination. Therefore, to highlight the potential of this approach, I draw on research from a video ethnography in a primarily low income, Mexican American 6th grade US classroom that came to focus on four girls’ surreptitious use of a fashion-themed multiplayer online game, Movie Star Planet, within classroom spaces. After giving an overview of the literacy practices enacted by the teacher and students, I analyze a literacy event reconstructed from several video clips of the case study girls simultaneously playing the game and collaborating through interaction in the virtual world and in-person. Key to my approach is the concept of the black box, a concept or object whose contents are a mystery to the user. I find that without opening a number of black boxes around technologies-in-use, the digital literacy accomplishments of the students would otherwise be poorly understood, simplified, or simply erased. The participants’ discussions about the game while creating avatars and profiles display ongoing constructions of gender norms. All of this occurred in interaction with and shaped by a multitude of other actors, including with the hardware of their laptops and the design of the game itself. Examining such “conversations” (Gee, 2014) not just between individuals but also with other designed material elements is key to examining literacy practices.

**Literacy as an Interactional Network**

I am arguing for something like a “material turn” to follow the “social turn” and the somewhat more recent “digital turn” of NLS (Mills, 2010). There is always a danger that theoretical “turns” amount to little more than navel gazing. However, there are real
implications in the design of social and technical systems (from classrooms to MOOCs to learning games) from understanding literacy as a complex interactional network. I draw on material semiotics as a way to bridge the old and the new theoretically and methodologically by bringing together theoretical perspectives that have advanced thinking on literacies. Literacy events, digitally mediated ones in particular, are entangled with actors far beyond the spatial and temporal confines of classrooms; this entanglement is vital to understanding how literacies are done.

Research on digital literacies increasingly acknowledges online "lives" as inexorably connected to offline worlds (Leander, 2008; Fields & Kafai, 2009). However, much research on digital activity largely neglects to treat such connectivity theoretically or methodologically as occurring in a single ecology. This is because of a tendency to discuss digital literacies as distinct from other literacies and, to some extent, as operating autonomously (Gee, 2012; Street, 2003), to wit: particular literacies that suddenly transcend context (video game literacy, Twitter literacy, etc.). Although there are exceptions, the overall consequence is that the groundbreaking work of NLS—no longer “new” — is not well utilized in recent work on digital literacies. I suggest that additional theoretical tools drawn from material semiotics along with video analytic methodologies provide a robust pathway to bridge the gap and expand digital literacies theory. In this performative approach, digital literacies are seen as entangled in and performed by material semiotic assemblages. Such an approach requires a type of methodological “disentanglement” and “reassembly” in explorations of their instantiating practices. Elsewhere (Bhatt & de Roock, 2013), I address the entanglement
of research instruments and researchers themselves, who intervene to observe and capture realities and subsequently to re-present them for research purposes.

Such an approach should not strike literacy researchers as entirely alien; this can be seen as an expansion of the transactional theory of meaning making (Dewey & Bentley, 1949; Rosenblatt, 1978). The term “transaction” was meant to counter simplistic notions of isolated interaction between the reader and the text and to escape dichotomous thinking about meaning residing in either the reader or in the text. Meaning, rather, emerges from a dialectical process involving the reader, the text, and the world; “all the actors in a literacy environment – observers, participants, texts, technologies, discourses, and so on – become integral parts of the sociotechnical practice defining literacy in that environment” (Bruce, 1997, p. 303).

The transactional process can alternately be described as dialogic, to use Bakhtin’s (1981, 1986) term, in particular as taken up in conceptualizing the dialogic emergence of culture (Tedlock & Mannheim, 1995). For Bakhtin (1981), “every concrete act of understanding is active” (p. 282) and primacy is in the response; “understanding and response are dialectically merged and mutually condition each other” (p. 282). My use of the terms “interactional achievement” and “interactional network” rather than transaction or dialogism are meant to convey similar notions without introducing additional terms for a transdisciplinary audience. This notion of interaction draws on work in conversational analysis, such as Schegloff’s (1982, 1995) work on discourse as an interactional achievement, and linguistic anthropological work on language as an interactive phenomenon (e.g. Duranti & Goodwin, 1992). Further discussing the
interaction as networked is meant to expand on discussions conceptualizing literacy practices emerging from a network of interacting heterogenous materials, both human and non-human, extended across time and space.

**Literacies and New Literacies**

There is rising excitement and trepidation among educators and researchers over the possibilities of building on youth participation with digital technologies. There is a sense that “the way” students learn is undergoing a radical transformation. However, much research into the ways learning happens with digital technologies fits quite well with research into the nature of all learning as situated (Gee, 2004; Lave & Wenger, 1991), embodied (Gee, 2008), and social in nature (Gee, 2003; Vygotsky, 1978). In other words, in addition to digital media already being infused in students’ lives, these media are particularly well suited (by their very design) to enhance learning, rather than simply being well suited *because* they are infused in student lives. This may be contrasted with other recent forms of media, such as television or portable CD players, that have not greatly enhanced learning environments due to the specifics of social adoption, but also by virtue of their lack of the interactivity found in new digital media (Davidson, 2011). Ironically, while much software designed for teaching continues to follow instructionist (Sawyer, 2003) models of learning, commercial and consumer (not necessarily educational) technologies have been found to provide a forum for and improvement of collaborative learning among students (Thomas & Brown, 2011) and thus are sometimes better suited for use in classrooms.
NLS, opposing a psychological and cognitive view of literacy, looks at literacy as a social rather than simply individual practice, a socio-cultural rather than simply mental achievement, and understandable only within a broader range of contextual factors rather than isolated mental processes (Gee, 1991). NLS is an extension of such thinking that also has broadened the technologies associated with literacy. My research directly or indirectly addresses many of the key concerns raised as NLS focused on digital literacies, including the scope of what is literacy, effects on learning, informal versus formal literacy, and issues of class in new literacies research (Mills, 2010).

Literacies have been defined as “socially recognized ways of generating, communicating and negotiating meaningful content through the medium of encoded texts within contexts of participation in Discourses” (Lankshear & Knobel, 2006, p. 64). This definition is meant to encompass the complexity of literacy and the multiple modalities it involves. The New London Group began an expansion of definitions of literacy to include multiple modalities; they use the term multiliteracies. Many other scholars have built on, expanded, and contested Knobel and Lankshear’s definition.

Digital literacy practices should be contextualized within broader learning ecologies, “the set of social contexts, including activities, relationships, and resources, that students access to structure learning across school, home, and community settings” (Mills, 2010, p. 253), which I conceptualize as part of the broader material semiotic assemblage enacting literacy practices. While for some students in my study access to new digital media is relatively new (an introduction), for others only the particular software, apps, or uses are new (an appropriation).
New Materialisms and Fuzzy Ontologies (or: We Have Always Been Cyborgs)

Material semiotics is an umbrella term for methods that map social relations as both material and semiotic. Actor Network Theory (ANT) originated from the field of Science Technology Studies (STS) to examine processes of knowledge creation and design in scientific and technical fields through empirical ethnomethodological and ethnographic methods. It is a poststructuralist-influenced “non-representational” approach that seeks to contest dualisms, notions of epistemology, and thinking on ontologies. Law sees the heart of ANT as “a way of suggesting that society, organizations, agents, and machines are all effects generated in patterned networks of diverse (not simply human) materials” (Law, 1992, p. 380). In the last 20 years, ANT has been taken up nearly every field in the social sciences, including education (e.g., Fenwick & Edwards, 2010) but only in limited ways with a focus on literacy, with the exception of some recent work (e.g., Bhatt, 2014; Bhatt & de Roock, 2013; Leander & Boldt, 2013).

“Old” Materialist Roots

Like my nod to the importance of theorizing technologies for literacy, there is nothing new about a focus on the material in social theory or situated practice approaches. ANT has been traced back to Spinoza’s debunking of the Cartesian mind-body duality. Material semiotic (and related) approaches can also be traced to the writings of Marx and Engels, in particular to the dialectic method, dialectical materialism, and historical materialism. A central point is that the foundations of thinking and the origins of knowledge in particular, are determined by the material
world, (i.e., what lies outside our skulls). Social life shapes human thought, which in turn shapes human conceptions of reality, which are conceived of as “sensuous human activity, practice... subjectively,” per Marx (1978, p.144). The connections between people—through human practice and activity—should be at the heart of analysis, rather than isolated individuals, a concept that Marx describes as abstract. “Social life,” Marx (p. 145) explained, “is essentially practical.”

Marx and Engels also understood the universe to be an integral whole of interdependent elements in a constant state of motion, rather than an unordered collection of disconnected elements. In an insight he links to ancient Greek philosophy, Engels (1925) insisted that “the whole of nature, from the smallest thing to the biggest, from a grain of sand to the sun, from the protista to man, is in a constant state of coming into being and going out of being, in a constant flux, in a ceaseless state of movement and change” (p. 43).

Foucault’s material semiotics is another important influence on ANT. Influenced heavily by Marx and Engels, ultimately Foucault considered himself a Nietzschean in his genealogical approach—which is certainly relevant here. Foucault (1980) discussed the physical mechanisms and knowledge structures that enhance and maintain the exercise of power within the social body as a dispositif (apparatus)—“a thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions—in short, the said as much as the unsaid” (p. 180). Foucault was discussing the apparatus of sexuality, but the concept
relates closely the ANT understanding of networked social action. Schools, and the orders of discourse they regulate (New London Group, 1996) are simultaneously an element of the dispositifs, an apparatus in their own right, and structured, constrained, and defined by dispositifs. Literacy, I am arguing, can also be understood in this way, heterogeneous ensembles intimately tied in with broader social and power structures.

**CHAT, Scaffolding, and Cognition**

Cultural Historical Activity Theory (CHAT), building on the work of Vygotsky and Leontiev, takes activity as a central focus. CHAT assumes that people do not simply act in direct response to internal or external events, but rather “act in relation to collective cultural” (Holland & Lave, 2009, p. 5). CHAT understands higher mental functions as being culturally mediated. It has served fruitfully as a framework for examining the evolution of complex learning environments over time, understanding individual activity as ongoing historical becoming within broader social contexts (Steinkuehler & Black, 2008). The activities CHAT centers on are not brief or contained occurrences (such as a lesson), but rather “an evolving, complex structure of mediated and collective human agency” (Roth & Lee, 2007, p. 13), such as the activity of technology use.

Technology is typically seen as something that mediates or is used to learn and eventually *internalized* by CHAT influenced education scholars. In this view, technology becomes something that “scaffolds and fades” (Pea, 2004). When it is clear there is no internalization, there is a sense of it functioning as a “mediating artifact,” but without tools for unpacking what that really means in practice, the artifact becomes either
neutral or determinant. When technology does not fade, the ways it supports cognition is really “distributed cognition” (Pea, 2004) and not scaffolding at all. Work in situated cognition stresses “learning in terms of whole practices in actual contexts with collaboration and various tools and technologies” (Gee, 2010, p. 31).

An actor network approach is closely compatible with a distributed cognition approach but provides compelling theory and vocabulary for revealing the mechanisms of distributed (network) action that go beyond cognition; cognitive approaches tend to privilege the human actors. In considering learning as social participation (cf. Ito et al., 2009; DiSessa, 2000), I look beyond the individual mind or interaction at the cognitive ecology (Hutchins, 2010) – the social (semiotic + material) context – where the learning is embedded.

**Actors, Actant Networks, and Ontologies**

ANT adds to CHAT a focus on interrelations in networks that include non-humans as actors in a given system; in my research, desks, or chairs, and especially computers, software, etc. take active roles in shaping learning environments. From a cultural-historical perspective, they might be seen as cultural artifacts that enshrine the agency of their creators and broader cultural-historical contexts. In other words, their agency in the contexts of use can be seen as derived from the agency of those who brought it into that context.

One central but controversial argument of ANT is the idea of non-human agency, including inanimate objects. It is easy to be caught up on this argument, and many, it seems, never get past it. The point, however, is that agency emerges from a
heterogeneous network with human and nonhuman components. Orlikowski (2007) contended, “there is no social that is not also material, and no material that is not also social” (p. 1437). ANT researchers discuss knowledge but also agents, social institutions, machines, and organizations “as a product or an effect of a network of heterogeneous materials” (Law, 1992, p. 381). In this recasting, knowledge is something produced through a social process involving a myriad of dispersed actors rather than discovered or created through the operation of a privileged scientific method.

Drawing on this notion of a material semiotic *assemblage* (Fenwick, Edwards, & Sawchuk, 2011; Johri, 2011; Orlikowski, 2010), digital literacy events can be understood as constitutive entanglements of social and material agencies. I use this theoretical construct to address the complex entanglement of social and material work that goes into classroom digital literacies. Leander and Boldt’s (2013) critique of representationalism in literacy research draws on Deleuze and Guattari’s (1980) who argue that there is no independently existing entities except as they materialize and attain different qualities through their particular relations and configurations over different spatialities and temporalities. Realities therefore can be “collateral” (Law, 2012) and “multiple” (Mol, 1999), rather than singular or coherent, and inseparable from and assembled by the practices which emerge at a scene of interest (Bhatt & de Roock, 2013). There is no superstructure at play—the macro-actors are, in fact, made up of micro-actors (Garfinkel, 1967; Latour, 1993). Latour argued that even when exploring enormous institutions, such as the US school system, we never leave the local, as disparate as interrelated localities may be. Similarly, Wortham (2012) argued that
researchers need to move away from a micro-macro framework by focusing on processes across various timescales (Lemke, 2000, 2001), with different phenomena requiring attention at different scales.

**Technology**

Of the many areas within education, it is possible that literacy should have the most to say about technology, given how central it is to our research. However, this is not the case. As I have argued, technology is under-theorized and sometimes incidental to discussions about literacy. As literacy researchers, we can contribute to research understanding technology as a tool-mediated social practice and as essential to intelligence as “a process of adaptation to, and transformation of, the conditions of life” (Cole & Derry, 2005, p. 2). Culture is not a body of knowledge that is inherited, culture is a medium of human development negotiated through ongoing activity in collaboration with the ongoing development of technology. When Geertz (1973) wrote about culture arising from the “trafficking in significant symbols” (p. 45), he included mechanical devices like clocks in his consideration of symbols.

Technology use itself is a situated social practice; it is an ideological human activity. This means acknowledging the importance of cultural artifacts within cognitive systems; in other words, the ways that artifacts (a calculator, compass, formula, etc.) are both part of our cultural inheritance and mediating factors in our cognition (Hutchins, 2000). In these ways, our cognition is not simply in our own heads nor is simply our own. Furthermore, our thinking is inseparable from tools, artifacts, and, more generally, technology. In the same vein that ANT theorists understand the creation of scientific
knowledge, ANT conceptualizes technological development “as a nondetermined, multidirectional flux that involves constant negotiation and renegotiation among and between groups shaping the technology” (Patriotta, 2003, p. 46).

Increasingly, learning is mediated through technology to some degree, such as in the research context at hand, although this is by no means anything new (only the technologies themselves are new). Cole and Derry (2005) discussed the interconnected nature of human intelligence and technology in its most basic sense, from a phylogenetic perspective. They saw the divide between the two as a false one. Technology is a tool-mediated social practice and intelligence “a process of adaptation to, and transformation of, the conditions of life” (p. 2). The use of technology is never a fully “virtual” experience, particularly within schools but even within students’ home lives. Situated practices and learning are mediated both through technology (such as social networking) but also through face-to-face interaction between students, students and teachers, students and parents, etc.

**The Old and the New**

I encourage fellow researchers to resist a simplified dichotomy of the old and the new literacies (Moje, 2009) along with other (often ethnocentric) definitions of contemporary/modern and traditional/classic; such a resistance makes possible an “ethnography of the contemporary world” (Latour, 1993). Discussions of “new” literacies (or new digital media, etc.) are useful when referencing a “historical rather than temporal perspective” (Lankshear & Knobel, 2007, p. 224); that is, “new” literacies are not simply, and may not even be, the most recent. It is a particularly social
designation. Technologies and practices deemed new are simply those that have not become naturalized as social practice (Davidson, 2011). Thus, while it becomes difficult to discuss email as new (even though it is), social media and other Web 2.0 technologies are readily seen as new. Such a designation is important when the relative merits of a technology are debated, such as within pedagogy; while nobody debates what is lost or gained by using books or even DVD’s, opinions are highly polarized around new digital media. Moje (2009) commented that the field could “benefit from more studies that analyze how [new digital] media are used, what literacy practices get taken up and learned while using new and multiple media, and the effects of such use on a range of learning outcomes” (p. 358).

There is a tendency, including in Lankshear and Knobel’s (2007) discussion of “new technical stuff” and “new ethos stuff” up to recent writing on digital literacies, to conflate the technologies (e.g. Internet enabled smart phones) with their affordances (mobility, compact, etc.) and the practices that arise from them. They argue that the “significance of the new technical stuff largely has to do with how it enables people to build and participate in literacy practices that involve different kinds of values, sensibilities, norms and procedures, and so on, from those that characterize conventional literacies” (p. 225). In such a focus on the affordances (Greeno, 1994) of technology, the material is seen as a conduit to social practice, but not a participant. The newer technologies may not be rendered invisible, as “old” literacy technologies like pen and paper are, but are “without a voice” (Woolgar, 1991).
When addressing the place of technology in literacy practices, we should move away from technological determinism but also the invisibility of technologies. Speaking simply of literacies may isolate the practices; reference to digital literacies tends to picture literacy as something that happens in a virtual realm. The discourses around new digital media often treat their use as an escape, something virtual and apart.

*The Material in the Multimodal*

Theoretical understandings of social action also affect considerations of multimodality. While literacy is never separate from a technology (pencil, printing press, iPhone, etc.) (DiSessa, 2000), it cannot be thought of as simply linguistic as the ways of communicating grow and intermix (Jewitt, 2009; Kress, 2009; Lemke, 2002), nor can learning be linked solely to language and print literacy (Jewitt, 2006). Paper and computer screen (and tablet or smartphone screen) are distinct sites of display for which different modes take on different kinds of social meaning (Jones, 2009). These are not simply the mediating artifacts for the display of information; they are “social occasions in which particular configurations of modes and media converge in a particular time and space in order to make particular actions possible” (p. 114). The site is not a neutral medium, but is *ideological* and interacts with the viewer. While we may speak of affordances (Greeno, 1994) of particular modes or technologies, we cannot predict how sites will be used as embedded within a specific social context, since they are constrained or enabled by overlapping sites. A computer screen (or textbook) has different affordances in the classroom compared the same screen in a child’s bedroom.
Different sites certainly offer distinct affordances. Much has been written about the multimodality, interactivity, and transformability of the screen versus the page (Jewitt, 2009; Kress, 2003; Kress & Van Leeuwen, 2001), a divide that has only increased with the advent of touchscreen devices. One useful concept is the order of discourse, which is “the structured set of conventions associated with semiotic activity (including use of language) in a given social space” (New London Group, 1996, p. 74). Discourses are interrelated and intertwined; they speak to each other. There are different design conventions within orders of discourse, which are inscribed in texts but also in technologies themselves.

More recently, in a move that resonates with ANT sentiments, Gee (2014) proposed a unified theory of discourse analysis that analyzes all human behavior as interactions, whether between individuals (such as teachers and students) or with texts (video games in particular). As a literacy scholar steeped in poststructuralist theory and everyday reality (full of hybridity, fluid boundaries, nebulous dichotomies, etc.), there is an issue with a “sociocultural” approach. Both concepts, the “social” and “culture,” have been under attack for some time and thus whittled down to mean very little, at least in their common usages. Latour’s reassessment of the social is much like González’s (1999) questioning of the relevance of the term culture. Material semiotic approaches challenge uses of the term social as being so overused as to be almost meaningless (Latour, 2005). “Social” is often used as an adjective, such as “wooden” might be used, to describe a certain physical quality of something (like a “social explanation”), whereas it refers to relational structure (network) attributes. Latour calls
for sociology to be redefined as the tracing of associations with a focus on inspection of connections between actors.

The Study

Research Context

The materiality of literacy is best understood in messy classroom realities. The data were drawn from classroom participant observations and digital recordings of a group of 6th grade girls playing an online fashion-themed multiplayer game in various combinations of online and offline interaction, cooperative play, and solo play. The study was guided by the broad research question: “What practices are evidenced in student learning through a combination of face-to-face and computer mediated collaboration when engaging with new digital media?” It therefore began with Latour’s (2005) urging to "follow the actors” (p. 12) and came to focus on the girls' gaming as a particular network of interest (Fenwick & Edwards, 2010) that became visible and analyzable only by combining synchronous online and offline video data.

The school was largely representative of similar schools in the district and area at the start of the research, serving 80% Hispanic students but also smaller populations of White, African American, Native American, and Asian students. Seventy percent of students were eligible for free or reduced lunch prices, compared to 51% statewide. Thirteen percent were classified as English Language Learners (ELLs); the ratio of ELLs to the Hispanic population is lower than comparable schools, indicating the stability of the Mexican American community served. I selected a single 6th grade classroom made up of a white middle class female teacher and 24 students: 21 Mexican American, one
Vietnamese, one White, and one African American. Within the semi-formal tracking system of the school, it was considered an academically “low” class in terms of academic performance by the teacher and the students were nearly all of low socioeconomic status.

The students were largely from first and second generation immigrant families, and nearly all were classified as ELLs at some point, with two designated English Language Development having not tested out of ELL status. While the language of instruction was (by state law) English, both English and Spanish were used for peer interaction and occasionally by the teacher to clarify points. The school district was in the second year of a voter approved one-to-one laptop initiative, including a mandatory use of the technology by 6th grade teachers. The main teacher was a White, middle class woman in her 30s who had been teaching at the school for five years. The technology coordinator, with whom I also worked, and other teachers represented a similar demographic. This paper focuses on a group of four girls: three Mexican-American and one Asian-American.

Methodology

The study methodology was formulated following what Latour (1993) described as an Ariadne’s thread that extends without break from the local to the global through the network of practices and actors responsible for the emergence of a given social practice. Following Gee’s (2014) proposed unified theory of discourse analysis, such an understanding requires investigating broader interactions beyond speech or literacy events focused on the girls’ interactions alone, including an examination of interactions
with research agents and instruments, material elements, and the communities that contextualize the interactions. As the communities and material realities extend across time and space (as networked social arrangements), our investigations should also traverse these geographies, but always remain grounded in the emergent social action of the research participants. Disparate network nodes become relevant when they are enacted for the emergent accomplishment of social action.

The overall methodology is ethnomethodological (Garfinkel, 1967, 1996), connective (Leander, 2008), multimodal ethnography (Dicks et al., 2006). I engage both the virtual and quotidian as a single ecology. I utilize micro interaction analysis—especially conversation analysis, multimodal semiotics, linguistic anthropology. Data consist of field notes, audio recorded interviews, video recordings of whole class and small group interactions, screen captures of work products, screencasts of ongoing computer use, and videos captured through student webcams. Multiple and simultaneous screen-in-screen webcam/screencast recordings of individual students paired with wide-angle recordings of the small group allows for a broad and complex data set and detailed analysis. Occasionally students in different classroom were captured interacting online while interacting with their peers around them. Student interview data focused on out of school digital media and technology use. Analysis was done with the assistance of Transana (Woods & Fassnacht, 2012) and ELAN through coding layered transcriptions of multiple, simultaneous data sources through a process influenced by grounded theory method (Charmaz, 2014). In the process of theoretical saturation, the use of a MMOG by a group of girls emerged as salient.
To analyze the multiple and in-computer video recordings, Transana is uniquely positioned for organizing, viewing, gisting, synching, transcribing, and analyzing video recordings with a sequential analysis orientation, in particular conversation analysis. Video files were given keywords according to phenomena of interest within and assembled into “collections” of related videos based on keywords. Screen capture video emerged as the most useful. Starting with files tagged on-site, I scrutinized the recordings for noteworthy and discernible moments to address the research question. In associated transcription files, I then created timestamp associated cursory summaries and open coding of salient videos. Since Transana is biased towards CA studies and not well designed for large data sets, although it has since improved, this system was developed as a work-around.

Based on open coding, I conducted selective coding on salient video segments to advance theoretical sampling and find specific moments for transcription. To avoid the risk of a type of data saturation brought about by a potentially overwhelming amount of data, in line with Heath et al. (2010), I focused on particular literacy events occurring over 10-60 minutes to develop a descriptive video log, then focusing on segments of approximately 10-30 seconds for repeated viewing, transcription, and in-depth analysis. Selection was based on a range of concerns influenced by the research question, observational notes, and other relevant and supporting data (e.g., interviews with students, the teacher, and administrators). When I selected specific video segments, I paired them with concurrently recorded co-present screen recordings along with the tripod-mounted camera recording. I synchronized them so they advanced from the
same point in time and provided multiple data streams of the same time period across multiple computers and physical spaces. Following other interaction analysts, such as Büscher (2005), Goodwin (2000), and Mondada (2006, 2012), I have come to rely on screenshot series combined with conversation analysis transcriptions for the presentation of analyses in academic publications.

**Following Ariadne’s Thread in a Digitized Classroom**

In order to demonstrate the utility of a material semiotic approach that focuses on literacy practices emerging from networked social action, I examine several occasions of the case study girls with a description of their literacy practices as interactional achievements of a multitude of actors, both human and non-human and across time and space. I contrast student practice emerging from what I am calling the “digitized status quo” of the teacher’s curriculum with the more situated practices in and around the online game. This analysis links to the above theoretical conversation by examining literacy practices as more than individual or even simply social practices. Approaching literacy as networked interactional practices reveals the broad shaping of social action by the computer hardware and software, ideological construction designed into the game by a team of game designers, the peer group conflict around bringing one of the girls, Sara, into the game, and the game avatar and profile as collaboratively constructed semiotic spaces.

**Digitizing the Status Quo**

In integrating laptops into her curriculum, Mrs. Jones tended to reproduce the more didactic aspects of her pedagogy. For example, she moved worksheets to digital
format for test preparation, allowing her to more efficiently review and discuss student work in whole class and one-to-one settings. Even the project-based learning aspects of her curriculum were modified versions of analog assignments, such as picture books created by students that had previously been created by hand. This is what I describe as “digitizing the status quo,” as teachers integrate technology without changing models of knowledge transmission, power differentials, and discourses of academic literacy.

The teacher expressed that, if nothing else, the integration of technology would lead to improvements in student engagement—even when the kids were doing essentially the same activities they would have done otherwise.

Mrs. Jones by no means operated to please her district superiors; her commitment to her students led her to frequently resist district and state policy mandates. For example, she resisted policies on English Language Development instruction, supporting students in Spanish when needed and breaking up a state-mandated three-hour instructional block. Her instructional strategies tended to break the mold of ways other teachers prepared students for standardized tests. However, her more innovative and engaging activities were those she had students do without laptops, such as team vocabulary games. It seems likely the introduction of laptops tended to constrain her pedagogy by centralizing it around one particular mode of engagement with classwork using laptops, with a particular pattern of interaction, set of expectations, and patterns of resistance and evasion.

In one example project from earlier in the semester, students designed digital posters in a competition to be featured on a local animal shelter website. The project
was the culmination of a unit on persuasive writing with the theme of responsible pet ownership. After filling out graphic organizers on their computers, writing five paragraph essays, and creating group paper posters, students created them anew on Glogster, a digital poster web app:

![Figure 1. Jen and Marta’s winning Glogster poster.](image-url)
The assignment was explicitly a test of persuasive essay skills. Implicitly, the assignment became a competition of student technological and design know-how along with standards the ability to reproduce the teacher’s discourse on animal welfare, which is generally far from a central issue in the working-class Mexican-American communities from which nearly all of the students came. The poster created by Jen and Marta won the classroom competition (they were asked to retrieve it online and email it to their teacher during one of the recording sessions featured in this paper). It was a remarkably more creative composition than their classmates’ and a careful ventriloquizing of the Mrs. Jones’ discourse.

The creation and movement of the Glogster poster was an opportunity for students to develop and display (in Jen and Marta’s case) design skills in a format with real-world application, if not particularly resonant with their own communities. It also serves as a strong contrast to the perhaps less remarkable but significantly more situated community participation and personally meaningful activities of the girls’ collaborative gameplay, further discussed below. The assignment also demonstrates the process of digitizing the status quo. Through concerted efforts within school policy constraints, even massive technological infrastructure investment and reorganization of classroom practice can result in a reproduction of classroom power dynamics and participant structures (Philips, 1983). In other words, while all the new hardware and software resulted in the veneer of transformed classroom literacy practice, it was business as usual. Students were not asked to approach reading and writing in new ways, nor to dip into their own community or digital funds of knowledge, but rather to
reframe an outsider discourse through the requirements of curricular standards.

Importantly, this was not an inevitable or “natural” ordering of a network – it was only through great efforts, such as effectively limiting networked and social affordances of the laptops, that this arrangement came about. The result was essentially a digitized collage; the Glogster poster is reminiscent of the work students produce when given old magazines and asked to create art. Digitization, despite possibilities, added little.

**Secretly Famous with “Movie Star Planet” (A Narrative Vignette)**

It is a few weeks before the end of the school year and a group of girls are engaging in a routine activity, playing a celebrity-themed online multiplayer game, Movie Star Planet. Two of the girls, Marta and Jen, are playing on their laptops. Marta is playing a multiplayer minigame, clicking on other players’ pets to gain points while other avatars are in discussion. Jen is examining game leaderboards and revising the text of her profile. They are in constant conversation with each other, other players online, friends through IM, and the researcher.

When Jen steps away, Marta’s other friend, Sara, who has forgotten her laptop, makes a bid to login and demonstrate what a low level she is on. Over the next twelve minutes, Marta proceeds to scaffold progress in the game for Sara, passing the laptop back and forth to help her to conduct the key activities while making the avatar more personalized. Exchanges of action take place by sliding the laptop to face the one taking control, but their hands continually overlap one another’s on the trackpad and keyboard, Marta and Jen often physically pointing to areas on the screen to click. Marta is specific about what activities over which she takes control, what she narrativizes, and what she has Sara take ownership of. She takes control for routine leveling up moments (what gamers call “grind”), narrativizing progress for more complex activities. The
discussion includes sensitivity to issues like not dressing in black for fear of coming across as “goth” to “people” and what kinds of clothing and household decor they like. At key moments, in particular with actions visible to the broader game community like dressing her avatar and decorating her house, Marta forces Sara to take control for ownership over her character.

While scaffolding Sara’s entrance into the community, Marta enters into conflict with Jen, who had introduced Marta to the game and is significantly more knowledgeable than her. At first refusing to take part in the on-boarding, she actively resists becoming a participant, and then attempts to derail their activities, pointing to places she wants them to click and angling the laptop screen so she can take part. The session ends when Jen refuses to give them access to ways of making her character friends with Sara’s, essentially shutting Sara out of the in-game friendship community. At that point, Marta and Sara both take independent paths to accomplishing schoolwork and repair what could have been damage to friendships. The best friends return back to their normal joking later in class. The following week the girls all play together at lunchtime and during class, with Marta and Jen collaboratively creating an entirely new character for Sara, who revisits topics like being goth as unappealing.

While the event described in this vignette may seem like a routine and rather mundane digital literacy event for the girls, in many ways a typical text-mediated social interaction of middle school girl, it is at the same time unique and crucial to the ongoing emergence of community and literacy practices. There are particular ways that the event is shaped by actors other than the girls themselves, but this shaping is far from deterministic. While the physical features of the laptop hardware and the design of the game software shape and limit the unfolding of the literacy event, they do not force the
meaning making practices in any particular way. Nor is the involvement of non-humans neutral or innocent. There are particular ideological constructs at play — the discourses of fashion and hierarchies of popularity are built into the game itself, creating pathways for power plays through friendship networks and centralized membership categories. Jen was clearly acting along such ideologies, both reinforcing them and reflecting them. This particular approach understands practice as emergent from and distributed between a network of heterogeneous materials, both human and non-human.

The online and offline are continually interwoven. Online practices occurred in tandem with offline peer social practices, although they are both intertwined and distinct. Goodwin points out, “Adolescents are not guided by an objective set of standards; rather in the midst of talk they actively seek standards of action and rules of morality, and establish such moral codes according to their own local culture...moral rules are emergent from local sequential contingencies of action” (2008, p. 190). These local contingencies involve material elements, but also localized instantiations of actors distributed across time and space — such as the game itself. The emergent interactive network connected the girls and hundreds of other individuals in both synchronous and asynchronous interactions while reorganizing their own offline interactions.

Procedural Rhetoric

One important (and perhaps hidden) factor is the design of the game itself (Bogost, 2008; Gee, 2014). Bogost (2007) describes video games as employing procedural rhetoric, “the art of persuasion through rule-based representations and interactions
rather than the spoken word, writing, images, or moving pictures” (p. ix). Built into the experience of video game play ("player experience” being a primary unit discussed by game designers) are ideological constructs like gender norms, not simply through semiotics but through the logic, process, and the structuring of interactions.

One defining quality of Movie Star Planet's (MSP) rule-based interactions is as an online multiplayer game with a free-to-play model. A free-to-play revenue model means the game has easy entry and that play is initially fast leveling, but with specific aspects of the game (such as special items) and opportunities for faster advancement through payment. In MSP, players move through the game by making movies and playing games that earn StarCoins. Most features of the game are free to all users, but players can pay to upgrade to a VIP account that gives players access to more game features, clothes, and other items. Players can also purchase extra StarCoins using a credit card or cell phone. Free-to-play games are designed for players to hit “walls” in the game experience that drive them to spend money. At the same time, they maintain player interest from the beginning by tying together elements such as a tween-friendly celebrity and fashion theme, personalization of avatars, a constantly relevant in-game community and friendship system, a currency system for personalization, and addictive simple games to advance levels and acquire currency.

While such a design is based on monetization of player engagement, the same mechanisms also potentially draw players into personally meaningful engagement within the community and do so with relevant topics. Such meaning within the game is shaped by the game design, the art and styles within it, and the community of players.
within as well as around it. When playing MSP, the girls engaged in peer interaction, content creation, and various expressions of identity through a variety of material-semiotic practices and modes. In the process of creating avatars (through textual, image, and video manipulation) the girls were able to try-on and try-out identities both literally, by creating and dressing up a character, and by adopting various “stances” (Bucholtz, 2009) in the process of digital creation, transformation, and interaction.

Such procedural rhetoric and broader game design had additional implications, many rather problematic and even insidious. The business model served as a mechanism of segregating the player community in haves and have-nots. Those with real-world economic resources could purchase access to additional items and status, while those without resources, such as the case study girls, were locked out or had to spend extra time earning points within the game. The girls displayed awareness of and sensitivity to such status distinctions by adding “VIP” to the ends of their player names in an attempt to emulate the VIP status conspicuously assigned to subscribing members.

Additionally, the semiotic resources available for players to create avatars constrained possibilities for players along normative gender and ethnic biases; only one body type was available and it was skinny. Adolescents, including the focus girls, had limited ability to choose their own body types. Skin color options were limited as well – of twenty-one skin color palettes, only three options reflected darker skin tones. Hairstyles were largely limited to more European styles with, for example, few ethnic hairstyles and no kinky hair.
Including the commercial and economic underpinnings of hardware and software involved in literacy events is important when examining interactional networks that give rise literacy practices. Such factors are increasingly relevant when discussing technologies of literacy. Digital media from Google to online games are created, maintained, and driven by profit motives including the monetization of user experience. This including analytics used for marketing, Google being the prime example of this, and uncompensated use of creative content, such as YouTube.

The Materiality of Identity Play

Thorne (1993) held that,

gender is not something someone one passively ‘is’ or ‘has… we ‘do gender’…kids use the frame of play (‘we’re only playing’; ‘it’s all fun’) as a guise for often serious, gender-related messages about sexuality and aggression. Notions of performance, or scripted action, can be used to understand shared practices that enact, and sometimes challenge, varied gender arrangements and meanings. (p. 5)

Gender, as a social construction, is not simply something individuals inherit or even acquire, it is something that is constantly being performed in the process of negotiating gender norms and gender identity. Thorne looked at the organization of kids play as ritualized interaction with issues of power, domination, and subservience at the center. Such an approach applies to video games, of course, including in the context of the case study girls’ engagement with, through, and around Movie Star Planet in the classroom.

Both character names and status updates within MSP frequently utilized words like “sexy” and “love,” reflecting adolescent entrance into the heterosexual marketplace (Eckert, 1994). Throughout my fieldwork in the classroom, the girls’ discourse on
gender identity gradually shifted within the game to fit more normative teen labels, proceeding but directly reflecting the discourse evidenced in their daily in-person interactions. Such practices were in keeping with the broader peer-gendered practices.

Figure 2. Jen changes a line in her avatar’s profile while engaging in tangential conversation with the group.

Jen’s profile is good example of the kinds of highly interactional personalized literacy events engaged in by the girls that contrast sharply with the classroom curricula. For example, earlier in the interaction shown in Figure 2, Jen is editing the MSP profile of her primary character, which is a 450-word text describing who she is (Jen, not the online persona) followed by the following headings: “What is the feeling
going to Asia,” “What Singers have I seen that are Asian,” “People That I Match
with!!,” “People That I dont Like,” “My Happy News!!!”), “My SISTERS and Brothers
on MSP!!!,” “How Do you get wishes/autos from me!!!,” “About Myself!!!,” “My
QUOTE.” As the profile is an open text field, these categories are partially derived from
the community-created genre norms combined with labels specific to Jen’s own values.
In particular, her profile is shaped around her Asian identity, including her opening
lines: “HEY!!! EVERY ONE! Let me tell you about myself Im asian and I know it.”

During this particular instance, Jen has gone into her profile to make a specific
edit to the line “My Other MSP account: Cant tell you,” which she hunts for and
changes to “My other MSP Account: UKissMe!” As she is doing so, she initiates a
discussion with me (thereby enrolling her friends) about how she has chosen to lie
about her age on MSP, even though her listed age does not show up. She expresses the
belief that it would make her a “loser” to list her actual age (12 instead of 14). The
discussion seems to index the broader implications of her text change, namely,
engagement in gendered adolescent peer discourse. Jen previously excluded gender
and relationship discourses from her statuses and profile. The previous week, she
critiqued the name of Sara’s character “HotGirl##1” as being “disgusting.” Revealing
the name of her alternate character revealed an ongoing socialization into normative
gendered discourse, possibly away from more personalized expressions that involved
her ethnic identity. Nonetheless, the play space actively carved out by the girls within
the classroom through engagements with, through, and around the game make such
explorations possible.
In particular, her profile is shaped around her Asian identity, including her opening lines and ample reference to her love of Korean pop, but is also full of personal statements:

5\hspace{1em}HEY!!! EVERY ONE!
6\hspace{1em}Let me tell you about myself I’m asian and I know
7\hspace{1em}it, I am a trustworthy girl I hate to lie, It is hard to
8\hspace{1em}be friends with a girl like me because I like to be
9\hspace{1em}alone, I was born with happiness

Her closing lines read:

My QUOTE
"Everybody in this world is gorgeous, No one is left out" – Me

Building on the concept of the assemblage, Leander and Boldt (2013) insisted that “the important shift is what texts are understood as doing; from a Deleuzo-Guattarian perspective, texts are not “about” the world, but rather, they are participants in the world…texts are artifacts of literacy practice, but do not describe practice itself” (p. 25). Compared to the ventriloquizing of their teacher in their digital poster (Figure 1), the situatedness of this text is striking. Not stopping in making declarative statements about her beliefs, Jen has elevated her statements into a quote. The rest of the profile (shown in full in the Appendix) is a mixture of displaying her Asian identity (in describing her favorite bands and where she has seen them), her positioning within the game community and norms (how to give and get "fame" or "wishes," which are part of the leveling system in the game), and broader statements about the types of people she matches with (blood type, nationality, not racist, etc.).
**Scaffolding Identity**

I now turn to the occasion narrativized above to examine dynamics of avatar creation, which is a central experience of MSP and games like it. Avatars (the in-game character, in particular their physical appearance) can be understood as “not just placeholders for selfhood, but sites of self-making in their own right” (Boellstorff, 2008, p. 149). The technologies and semiotic resources at play are not neutral elements in such self-making processes, but nor are they deterministic. Jen's profile discussed above illustrates some of the ways identity can be played within the space of creating an online persona, although she was describing herself rather than her character. Fields and Kafai (2009) held,

In creating avatars, representations of oneself in virtual spaces, and participating in virtual spaces, often one cannot be known outside of how one decides to portray oneself through visual representation, written chat, and perhaps an online profile…[t]here is thus an opening to create a new identity “from scratch,” or at least to choose which aspects of one’s self will bleed into one’s virtual persona. (p. 4)

*Figure 3. As Jen intervenes, the three girls physically vie for control of the process.*
In the process of scaffolding entrance into MSP in Figure 3, Marta shows Sara how to change clothes as part of an "onboarding" quest—part of the initial experience for new players that teaches them the basic features of the game while getting them invested in their character’s avatar, home, and social network. Gameplay is shaped by the physicality of seating, the design of the laptop, and design of the software, including the operating system and game community. Specifically, in addition to sequential guidance from the in-game experience (a particular design created by a team to “force” a particular player experience), the interaction is guided by peer group dynamics and the girls' own power struggles. Goodwin (2008) insisted that "to go beyond binary thinking we need to consider how females can create power asymmetries with females, and even with males” (p. ix). The procedural rhetoric, semiotic resources, and embedded discourses all work to shape (and then be negotiated by) the girls’ interactions, both online and offline. During the particular moments shown in Figure 3, Jen interrupts the gameplay of Sara (who, in image A, has her fingers on the trackpad with the screen oriented towards her) to insert herself physically into the game space and declare that she could do a much better job at leveling her character up. Six seconds later (shown in image B), Marta has inserted her fingers onto the trackpad (while Sara struggles to keep hers on) to counter Jen’s suggestion.

Jen backs off, although she continues to demonstrate her disapproval. Marta continues working with Sara on leveling up her character. After playing a mini-game to get money, creating an art book with an arbitrary name (since the name itself is of little
value), creating a “look” with the same arbitrary name, buying items for her room, and “liking” videos, they return to examining Sara’s avatar’s clothes.

Figure 4. Synched clips of Jen and Marta discussing Sara’s avatar while Sara clicks on alternate clothing.

Although Marta had hastily changed Sara’s avatar earlier to demonstrate the process, resulting in her wearing all black clothing, she then suggests that “people” will think Sara is “goth” based on her outfit. When asked what that means by Sara, she is unable to explain it beyond just wearing black. After sliding the laptop back over to let Sara start working on changing her avatar’s clothing, she makes another bid for including Jen in the process by asking if Jen agrees. Marta physically points to the black dress of Marta’s avatar while Jen leans over and comments, and Sara hands remain on the trackpad as she works to click on her old pair of green pants. After the outfit is restored with bright colors, all the girls are satisfied and they continue the process.

Figure 5 Sara indexes the previous week’s conversation about being goth.

1  J  Dude don’t do it no::!=
2  N  =Okay [okay] ((Standing up to get a treat))
The week after the episode from Figure 5, the girls are playing again during class, this time creating a new character together from scratch. As they are trying to come up with a name, Sara (in a rare moment of having Jen’s sole attention) looks directly at Jen and suggests using “Gothgirl” (line 5) in direct reference to the previous week’s conversation, demonstrating her knowledge of online possibilities and community norms. After getting a confirming response of “eww,” she pauses, then suggests “Iloveblack,” followed by more serious responses, but Jen has moved on to inputting her own suggestion, "Serenitygirl." I highlight this rather mundane carryover of discussion to highlight the ways combinations of semiotic resources available within the game, procedural rhetoric of avatar creation, audience of the in-game community (Marta’s “people”), sequential action guided by the game design, and peer social dynamics can result in furthering individual and group norms (the idea of “goth” as a negative social category) and the legitimate peripheral participation of members (Sara’s socialization into group participation and discourse).
Such discourses, literacy practices, figured worlds, gender identities, and other ephemera certainly exist, but they live neither within the heads of the girls nor outside the material elements that make up the networks of heterogeneous materials that are mobilized in these practices. This “assemblage” (Deleuze & Guattari, 1980; Law, 2009; Orlikowski, 2010) disrupts traditional notions of classroom context. While it indeed emerged from within a school “context” using sanctioned technologies, it brings together the digital activities and face-to-face collaboration of the girls in new ways and their entanglement with actors far beyond the spatial and temporal confines of their classroom. How their subsequent digital literacies are played out, and the identity work which emerged from them, was evoked by a virtual world consisting of millions of individuals influenced by popular culture discourses operating within software built by specific (predominantly male Danish) designers, artists, and engineers for profit. The avatars reveal the complex distributed nature of identities, enacted not only through technologies but also by them (Suchman, 1987; Haraway, 1991).

**Implications**

Drawing on interdisciplinary research on the technologies of meaning making, even beyond material semiotic approaches, will propel research on literacy. Above, I use research on video games to analyze the “conversation” between the players and game world (Gee, 2014) to better understand the practices and figured worlds of the girls. We can draw on research fields like mobile and platform studies (e.g., Bogost & Montfort, 2009), which looks at the relationships between hardware and software designs with the experiences of users. In these fields, our vocabulary can grow using
concepts like the “haptic” nature of emerging technologies where fingertip touches are increasingly central interactive features.

Woolgar (1987) stated, “Discussions about technology embody fundamental preconceptions about the nature of mankind” (p. 325). In the use of technologies, there is a clear continuity between the technical and lay thinking, rather than a clear rupture or shift. The danger of considering technology use and so-called technological thinking as separate from, rather than a subset or extension of, everyday ideas is that the latter will be spoken of pejoratively or somehow beneath the former. Lave (1988) considered this type of discourse (which may be considered common sense) the result of “a taken-for-granted divide between cognitive processes and the settings and activities of which they are a part” (p. 76) with roots in nineteenth century racialized categorizations of the “primitive” versus the “modern.” Lave, after Basil Bernstein, noted that taxonomies have shifted from describing civilized versus primitive peoples to differences between occupations and social classes. Given the growing digital divide, such tropes are readily used for understanding technology use, with technology use becoming riskier and more dangerous the further “down” one is. One example is on the occasion of urban riots, when social media (Twitter in particular) had been seen as directly responsible for violence rather than as something embedded into the everyday practices of residents engaged in rioting, thus robbing the participants of agency (Davidson, 2011).

The implementation of the digitized classroom is an opportunity to examine the ways “new” technologies can be appropriated into enacting old social arrangements; in other words, despite the presence of thousands of dollars in computer hardware,
software, and wireless Internet infrastructure (in addition to the hidden labor involved in establishing and maintaining such an arrangement), learning through the official channels can remain essentially unchanged. While this might be seen an instance of technology’s neutrality and subservience to human power enacted through social arrangements, a tracing of actors reveals this particular social order is a rather transformed relationship maintained only through great effort and with the enrollment of particular technologies as part of the emergent classroom assemblage. Finally, I am not alone in the seeing massive amounts of rapidly shrinking public dollars spent on technology that is ill-used, misused, or not even really used at all. I am suggesting identifying, tracing the roots and influences of, and moving as quickly away from the powerful discourses of progress around technology. I believe such a process is required to harness technology’s potential.

**Conclusion**

In this paper, I have taken an approach to literacy that builds on the foundations of sociocultural theory and attempts to rethink the way that technology is understood in relation to social practices. I discussed how NLS could benefit from a shift to understanding any “individual” actions, attributes, and ontologies as emerging from a network of actants. Such a shift entails understanding a given literacy event or practice as a distinct achievement that arises/emerges from interactions between a multitude of actors, both human and non-human, distributed across space and time. I hope that this shift provides tools for better understanding literacy practices beyond just their emergence by enabling us to trace the interactional networks giving rise to the practices.
In the empirical examples, I traced a diffuse network surrounding a peer group’s classwork and gameplay, including the legitimate peripheral participation of Sara and Jen’s online composition of her in-game avatar profile. Such student non-formal literacy practices emerged from network of actors including laptop computers a virtual world functioning as both value-laden software and extended community. I conclude with a number of implications for pedagogies of material multiliteracies including digital funds of knowledge (Gonzalez, Moll, & Amanti, 2006) and urge cautious awareness of powerful discourses of progress surrounding technology use that results in, at best, missed opportunities of technology integration, as illustrated in the example of digitizing the status quo, but also can render such use wasteful and even harmful in educational institutions.

Appendix A

Transcribed text of Jen’s primary character profile

```
1   ((Statement:)) NOT IN THE MOOD FOR NEW
2   FRIENDS PLEASE DONT ASK ME
3   ((Editing profile:))
4   HEY!!! EVERY ONE!
5   Let me tell you about myself Im asian and I know
6   it, I am a trustworthy girl I hate to lie, It is hard to
7   be friends with a girl like me because I like to be
8   alone, I was born with happiness
9   -I love KPOP since 2007 if you guys dont know
10  KPOP chekc it out I think you guys will love it.
11
12  What is the feeling going to Asia
13  -It was great I always love the part whwn we just got
14  off the airport in Asia. The part I hate is going to back
15  to America...because I miss my family:( ging again
16  next year in 2013
17
```
What Singers have I seen that are Asian

- TVXQ Xiah Junsu
- SHINee in May
- Super Junior in May
- SNSD in May
and alot more like SM ENTERTAINMENT, JYP, YP....

Do You Have To Watch my movie or give me fame ((In white))
You guys dont have to watch my movie ort look at ((pink))
my artbook I go on msp to hang I dont really like using people to get more fame:
People That I Match with!!!

I match with people that blood type O or A
People that loves KPOP!!!
(love talking about it with you)
People who are Asian, Australian, American and more

People That I dont Like ((blue))
People who are racist ((pink))
People who keep asking for wishes, You guys have to deserve it (how do you deserve it) Scroll down ((yellow))
People who lie ((green))

My Happy News!!!:) ((red))
4/10th/12- In level 4 now yay
5/20th/12 going to SM TOWN CONCERT
IDK WHEN IM GETTING SHINee WRAISTBAND

My SISTERS and Brothers on MSP!!!
antrybirds90 (My sister + BFF!!!)
love592 (My older sister)
B2stBoy (My small big brother)

My Other MSP account: Cant tell you
((changes to:)) My other MSP Account: UKissMe!
I go on it everyday , and I am still me:

We love KPOP!!! Mostly my older sister love5992 she loves all of kpop industry, my second older suster doesnt like KPOP that much the likes SHINee and me too
How Do you get wishes/autos from me!!!
- watch my movies and comment it
- People who are nice to me and needs help
levelling up

About Myself!!!
- I love KPOP
- I am ((illegible))
...

My QUOTE

"Everybody in this world is gorgeous, No one is left out" - Me

Transcript Notation

My transcripts follow a slightly modified Jeffersonian Transcription Notation including the following symbols:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Name</th>
<th>Use</th>
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<tr>
<td>[ text ]</td>
<td>Brackets</td>
<td>Indicates the start and end points of overlapping speech.</td>
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<td>=</td>
<td>Equal Sign</td>
<td>Indicates the break and subsequent continuation of a single</td>
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<td>interrupted utterance.</td>
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<tr>
<td>(# of</td>
<td>Timed Pause</td>
<td>A number in parentheses indicates the time, in seconds, of a</td>
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<td>seconds)</td>
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<td>pause in speech.</td>
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<td>()</td>
<td>Micropause</td>
<td>A brief pause, usually less than 0.2 seconds.</td>
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<td>. or ↑</td>
<td>Period or Down</td>
<td>Indicates falling pitch.</td>
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<td></td>
<td>Arrow</td>
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<tr>
<td>? or ↓</td>
<td>Question Mark or</td>
<td>Indicates rising pitch.</td>
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<td></td>
<td>Up Arrow</td>
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<tr>
<td>,</td>
<td>Comma</td>
<td>Indicates a temporary rise or fall in intonation.</td>
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<tr>
<td>-</td>
<td>Hyphen</td>
<td>Indicates an abrupt halt or interruption in utterance.</td>
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<td>&gt;text&lt;</td>
<td>Greater than /</td>
<td>Indicates that the enclosed speech was delivered more</td>
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<td></td>
<td>Less than symbols</td>
<td>rapidly than usual for the speaker.</td>
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<tr>
<td>&lt;text&gt;</td>
<td>Less than / Greater</td>
<td>Indicates that the enclosed speech was delivered more</td>
</tr>
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<td></td>
<td>than symbols</td>
<td>slowly than usual for the speaker.</td>
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<td>°</td>
<td>Degree symbol</td>
<td>Indicates whisper or reduced volume speech.</td>
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<tr>
<td>ALL</td>
<td>Capitalized text</td>
<td>Indicates shouted or increased volume speech.</td>
</tr>
</tbody>
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underline Underlined text Indicates the speaker is emphasizing or stressi
indicating the speaker is emphasizing or stressing the speech.
::: Colon(s) Indicates prolongation of an utterance.
(hhh) Audible exhalation
· or High Dot Audible inhalation
(.hhh)
( text ) Parentheses Speech which is unclear or in doubt in the transcript.
(( italic text )) Double Parentheses Annotation of non-verbal activity.
(letter) Bolded Curly Braces References an image at moment of capture within corresponding speech or action.

Works Cited


APPENDIX C: LEARNING AT/IN THE BOUNDARIES: URBAN GIRLS' SUB ROSA DIGITAL LITERACY PRACTICES

Much research on learning and literacy practices continues to view these phenomena as occurring within bounded geographic or social spaces. A growing literature examines and problematizes such dichotomies, challenging divisions such as formal/in-school versus informal/out-of-school practices. However, even theoretical approaches that originally pushed away from dichotomous thinking, like communities of practices (Lave & Wenger, 1991) or thirdspace (Bhabha, 1994; Gutierrez, 2008), are generally taken up as bounded, well-defined, easily located, stable phenomena. Thus, much of the research on literacy practices tends to take for granted and reinforce dichotomies that have been problematized for decades (Mills, 2010; Moje, 2009). Since the main culprit of misinterpretation seems to be the notion of boundedness itself, an interrogation of boundaries is needed.

This article revisits literature on boundaries from a literacy and learning perspective. I interpret boundaries and a number of interrelated concepts through data from a video ethnographic case study of four multi-ethnic girls’ (the subjects) surreptitious use while in a language arts classroom (de Roock, Bhatt, & Adams, forthcoming) of a celebrity-themed casual massively multiplayer online game (MMOG), Movie Star Planet. Through the analysis of a series of digital literacy events involving rich interaction with, through, and around laptops well outside of the gaze (Foucault, 1963) of the teacher, I discuss examples of twenty-first century sub rosa literacies (Gilmore, 1986). I explore these
practices using interrelated literature around the notion of boundaries, including Goffman’s (1961) concept of *underlife* and the notion of *third space* (Bhabha, 1994) as taken up by educational researchers (e.g., Gutiérrez, 2008; Moje et al, 2004). I undertake a moment-to-moment analysis of the agentive and emergent way the girls establish and play with various border ontologies. I end by discussing how designers of learning environments, whether learning scientists or classroom teachers, can design for such boundaries by understanding them as potentially productive and drawing on youth’s digital *funds of knowledge* (Gonzalez, Moll, & Amanti, 2006).

In the interest of grounding this discussion in data of everyday literacy practices, I begin with a narrative vignette drawn from multiple simultaneous video recordings, researcher field notes, and an audio recording. Segments of corresponding multimodal data are discussed later.

*During lunchtime near the end of the school year, a group of four multiethnic 6th grade girls are excitedly glued to their laptops playing their favorite game, MovieStarPlanet, a celebrity-themed multiplayer online game, where they are leveling up their characters through casual social games, editing lengthy profiles, creating art books, and having animated discussions about their activities, including with the researcher. One girl, Marta, moves over to a desktop computer to do so. Moments later, a loud beep sounds, signaling the end of lunch. One girl leaves for another class, but the others continue as they were. The teacher, from the opposite end of the room, recaps her directions for the block, directing students to finish their previous mapping of a picture book plot while continuing work on short story rough drafts that will eventually become a team digital story and physical picture book.*
While Marta’s closest friend, Jen, continues secretly to play the game, Marta works with yet a different girl creating a profile on the desktop, after quickly opening a new blank tab on her laptop to obscure her gameplay. When Jen’s work partner Sara makes a bid for her attention to continue schoolwork, Jen moves over to work with Marta on the desktop, first opening a new empty tab on her computer to conceal but preserve her two tabs of gameplay. Sara eventually moves over and the three rotate sitting at the computer to play even as the others remain huddled around. With full knowledge they can operate in secret while the teacher is busy conferencing and they are invisible from the computer monitoring software while on the desktop, they work together quietly, collaboratively creating a character.

They secretly tell the researcher to get a life, resist having to sing happy birthday but happily accept snow-cone treats anyway, pretend to feed their snow-cones to the camera, suggest using the password “motherfucker,” become variously aware of and concerned about research recordings, shush a girl who questions their gameplay too loudly, and otherwise take on a distinct disposition from gaming at lunchtime. Their quiet discussions avoid any class related talk, but swing from jokes about creating a “goth” character that refers to a previous week’s discussion, debate how to dress their character, note the lack of decent available hairstyles, and argue over how to name the communally created character. This continues until Jen is called to conference with the teacher, who dictates the rest of Jen’s story based on her outline until the end of class. Marta returns to her laptop, where she alternates between secretly playing the game and continuing to draft her story.

This vignette illustrates the ways the subjects collaboratively construct a classroom underlife in their actions surrounding the surreptitious playing of a multiplayer online
game to engage in personally meaningful identity work and participation in online and offline communities of practice. The practices of this peer group’s underlife were beyond the teacher’s immediate gaze and were shaped by factors distributed across time and space but with distinct presence in the ongoing interactions, including peer social dynamics, classroom tasks, computer hardware and software, the design of an online game, the community associated with that game, research tools, and so on. The everyday practices of the case study students, while rife with boundary construction, make boundaries fuzzy between dichotomous notions such as in-school/out-of-school or formal/informal literacies, thus problematizing the notions themselves. As in Goffman’s (1961) original study of public institutions, such peer practices help to maintain, reinforce, and make possible the standard and more valorized classroom practices.

**Theorizing Literacy at the Boundaries**

This study is based in a tradition of research examining youth social practices in school settings and the ways youth create meaning in their own lives, ways distinct and apart from, but certainly continually interacting with and indexing, the world of adults. Goodwin (2008) argued that once we move past understanding socialization as unidirectional or top-down, with adults transmitting social norms to children, it becomes essential to document the social interactions to improve understanding of youth meaning-making practices. In addressing this separate “space” of children’s interactions and the communities of practice (Lave & Wenger, 1991) that they form,
notions of boundedness become immediately relevant. In this section, I discuss the
notion of boundaries in relation to literacy and learning in communities of practice.

**Boundaries**

The notion of boundaries has provided educational researchers a productive way to
approach literacy and learning, in particular the dynamics of learning when it comes to
marginalized communities, spaces, and individuals. However, there is a lack of
specificity or groundedness in the ways boundaries are used. Even Akkerman and
Bakker’s (2011) survey and problematization of educational researchers’ use of
boundaries lacks empirical foundation for the kinds of nuanced discussion that the
concept requires. My hope here is both to extend discussions of boundaries to
incorporate moves in other disciplines while grounding the discussion in classroom
realities.

Akkerman and Bakker (2011) discuss boundaries as “a sociocultural difference
leading to discontinuity in action or interaction...[b]oundaries simultaneously suggest a
sameness and continuity in the sense that within discontinuity two or more sites are
relevant to one another in a particular way” (2011, p. 133). Boundaries, therefore, are
not meant to establish simple binaries or dichotomies, but rather co-constructions and
dialectic relationships, but without an end synthesis implied or expected (Lillis, 2003).
They are dialogic (Bakhtin, 1981) in that they are in constantly negotiated and in
dialogue with one another.

Barth (1969), in developing an interactional rather than socio-structural
anthropology, discussed the empirical bases of ethnic identity as defined through
ongoing negotiations of boundaries between people, even while group membership and participation changes over time. The boundaries of ethnicity are maintained and transformed through moment-to-moment negotiation within and between ethnic groups. More recently, Barth (2000) discussed unhitching boundaries from categorical distinctions, since they are not necessarily the same, using the example of day and night or land and sea - in both cases categorical distinctions are drawn without having distinct boundaries. He suggested that building a theoretical foundation of boundaries means a close examination of the sense-making practices in everyday interaction, as empirical and experiential questions.

The notion of “sites” is important to the boundary metaphor. Work on boundaries, much like work on other concepts, tends to focus on delimited and bounded physical or social spaces. Concepts like “boundary crossing” and “boundary objects” are generally understood as agents or objects moving between or bridging (respectively) distinct geographies. However, a boundary is both a discursive (semiotic) and material construction that constantly shifts and transforms according to the interactions of its diverse constituent elements. Issues of ontologies are discussions about boundaries — what defines the independent existence of cognition, identity, community, knowledge, classroom, etc. are specifically what separates them or sets them apart from other concepts or other units in the same category. Non-representationalist challenges to ontology are essentially reformulations of boundaries. In other words, all things are without definite boundaries (including boundaries themselves).
The networked social practices approach of ethnomethodology (Garfinkel, 1967, 2002) and, in particular, Actor Network Theory (Bhatt, 2014; Latour, 1993, 2005), further extends the complexity of boundaries. When approaching human activity, like boundary creation or literacy practices, without presumptions about the primacy of any given actor or the boundedness of any ontology, many taken-for-granted dichotomies fade away. In the previous article, I discussed the ways social practices like literacy are better understood through a distributed agency approach where they are seen as emerging from the fluctuating interactions of a network of heterogeneous actors, both human and non-human, extended across time and space. In the narrative vignette above, the emergence of the classroom underlife is one such example, but so are such accomplishments as the girls’ in-game avatars, their ongoing discussions, and the laptops themselves.

**Literacy and Situativity**

My approach to understanding literacy is grounded in the tradition of New Literacy Studies scholars’ social practice approach to studying literacy events (Gee, 1991, 2003; Street, 1993, 2003). This approach emphasizes “the inherently socially negotiated quality of meaning and… also claims that learning, thinking, and knowing are relations among people engaged in, with, and arising from the socially and culturally structured world” (Lave, 1991, p. 67). Following this, literacy is a situated social practice, whether students are using laptops, analyzing the structure of a story, or engaging with an online game. In other words, literacy and cognition occurs not within people’s skulls but is distributed through emergent communities in ongoing negotiation of meaning and
knowing through social participation. This is essentially a rethinking of the boundaries of cognition and literacy (Gee, 2004).

This social practice understanding focuses on literacy events as observable units of analysis (Heath, 1982, 1983), empirical occasions involving interaction and activities around a text (cf. Baynham & Prinsloo 2009). Central in the capture and analysis of literacy events is the “configuration of action, talk and text” (Prinsloo & Baynham, 2008, p. 4). The notion of boundaries is key here. Far from being isolated instances of reading and/or writing, literacy events are always nested within contextually bound occasions, such as religious rituals (Besnier, 1995), bedtime stories (Heath, 1982), or classroom assignments such as analyzing the structure of a story. Literacy events yield snapshots of the social and cultural order in which literacy activities are institutionally and organizationally mediated (Prinsloo & Baynham, 2008), yet also remain intimately tied to material culture (Brandt & Clinton, 2002).

Drawing from this notion, digital literacy events are observable occasions in which digital texts (broadly defined) play a role and where meanings are “mediated by texts that are produced, received, distributed, exchanged, etc., via digital codification” (Lankshear & Knobel, 2008, p. 5). This includes such things as the writing of assignments in a word processor, Google searches in student research, and the surreptitious gameplay of the girls in the narrative above. The repeated observation of digital literacy events situated within naturalistic activity over various timescales (such as ethnographic research seeks) is the key to elucidating digital literacy practices. Truly undertaking such an examination requires rethinking the boundaries of digital literacy.
event contexts. As Gilmore wrote before the advent of the Internet, “contexts and settings are not necessarily a matter of physical location but can frequently be a matter of situations within a physical setting,” (Gilmore, 1986, p. 156) which has only become more complex with the introduction of digital technologies into classrooms.

**Learning Within Communities of Practice**

Literacy and learning occur, are shaped within, and shape communities of practice (Lave & Wenger, 1991). This includes the localization of societal ideology and norms, which shape ideas of ontological categories. Through social action and participation, members shape, co-construct, and perform social norms and knowledge. Taking as given that learning is an integral and inseparable aspect of social practice, activity is situated and knowledge is not generalizable but rather is only acquired and takes on meaning in concrete and specific situations. A community of practice is the basic condition for the existence of knowledge; participation provides the epistemological principles and interpretive strategies needed to establish and make sense of knowledge, language, morals, norms, etc.

Following Pea’s (1993) reading of Wittgenstein, I understand learning as movement towards more central participation in a community through material and social activity. It is “defined dynamically through continuing participation in the discourse of a community, not primarily through the possession of a set of problem-solving skills and conceptual structures” (p. 271). Individuals do not learn simply by doing something, and certainly not through being taught directly, but rather they learn through “centripetal participation in the learning curriculum of the ambient
community” (Lave & Wenger, 1991, p. 100). Learning occurs as students participate in the multiple communities that make up schools, only one of which is the intended classroom community, moving from newcomer and progressing over time to old-timers.

Because such participation involves negotiating social relations, it also means the construction and transformation of identity, which is, of course, always social. Here Lave and Wenger (1991), as I do, “focus on the person, but as person-in-the-world, as member of a sociocultural community” (p. 52). Learning through legitimate peripheral participation in situated activities like apprenticeships is in stark contrast with didactic approaches in more constrained settings of school and workplace (Lave, 1988, 1991; Lave & McDermott, 2002). Correspondingly, theories of situated social practice contrast with theories that bracket off the social world as an object of study. Social Practice Theory (Holland & Lave, 2009) “emphasizes the historical production of persons in practice, and pays particular attention to differences among participants, and to the ongoing struggles that develop across activities around those differences” (p. 5).

In this view, learning is radically de-centered. However, it is a misinterpretation to say that situated learning does not occur in school or even the classroom. It is just not always (perhaps rarely is) the “learning” that teachers intend—a true “classroom community of practice” aligned with the teacher’s explicit objectives is rarely achieved. This is an example of where teacher perceptions of boundaries can limit pedagogy. The institutional structure of schools tends to restrict participation in communities of practice and, thus, situated learning. The contemporary social world of late capitalism is
characterized by the “alienation of knowledgeable skill from the construction of identity” (Lave, 1991, p. 77), the effects of which are especially concentrated in the workplace and schools. Constraints, stratification, and control “all serve to reduce the meaning and even the possibility of engaging as a peripheral participant in knowledgeably skilled activity in the classroom” (p. 78).

When it comes to social practice, like literacy practices, “the boundary of the domain or community is constitutive of what counts as expertise or as central participation… in terms of identity development, a key question is the distinction between what is part of me versus what is not (yet) part of me” (Akkerman & Bakker, 2011, p. 132). Communities of practice are often discussed as distinct communities that have clear boundaries and hierarchies, but were originally discussed and are best conceived of as multiple and cross cutting, porous and improvised.

The Study

Messy classroom realities provide the best means for understanding learning contexts and their boundaries. The data for this study come from an 8-month classroom ethnographic case study that drew heavily on video analysis methodology. The study began with the following research question: “What practices are evidenced in student learning through a combination of face-to-face and computer mediated collaboration when engaging with new digital media?” The question was intentionally open ended to allow focus on particular networks of interest (Fenwick & Edwards, 2010), seeking not just practices of interest, but the broader networks from which they emerged. Latour’s (2005) admonition to follow the actors led to a focus on a peer group of four girls (the
subjects): three Mexican American and one Southeast Asian American, who engaged in playing *Movie Star Planet*, a casual celebrity-themed multiplayer online game.

At the start of the research project, the school served 80% Hispanic students and smaller populations of White, African American, Native American, and Asian students. The school was largely representative of schools in the region, although it was rated somewhat higher than other schools in the district and had a reputation within the district for being the best run school. Seventy percent of students were eligible for free or reduced lunch prices compared to 51% statewide. Thirteen percent were classified as English Language Learners (ELL). I selected the school based on its relative success integrating laptops into classrooms as part of the district-wide 1:1 laptop program for middle schools. The focus Language Arts teacher was a White middle class woman in her early 30s. I selected her based on her interest and success using technology in her classroom; she had conducted digital storytelling workshops during previous years. The 6th grade class in focus convened in two class periods: Language Arts and Reading, divided by lunchtime. The classes were meant to have distinct curricula, but typically had much crossover.

The class consisted of 24 students: 21 Mexican-American, one Asian American, one White, and one African American. According to the teacher, as a result of the semi-formal tracking system of the school, it was a generally “low” academic level classroom with a higher proportion of ELLs than comparable classes. Nearly all students were low socioeconomic status first and second generation immigrants. Most classified as ELL at some point, with two designated English Language Development having not tested out
of ELL status. Spanish was commonly heard in the classroom between students and, despite English being the language of instruction by state law, the teacher often clarified instructions in Spanish during whole class, group, and individual instruction.

**Methodology**

This study follows Goodwin’s (2008) contention that understanding the ways children negotiate moral reality and social rules requires researching the ways they use language in ongoing interactions, specifically “conversation analysis combined with ethnography provides a powerful methodology for investigating how children—in peer groups as well as families—become competent social actors by learning to use language appropriately within these settings” (p. 245). Ethnography is the guiding methodology and epistemology (Agar, 2006) influenced by multimodal ethnography (Dicks et al., 2011) in the extensive use of video data contextualized by ethnographic fieldwork. Additionally, a connective ethnographic approach (e.g., Fields & Kafai, 2009; Leander, 2008) entails attempting to engage both the virtual and quotidian as a single ecology. Following this mix of interrelated approaches, I spent eight months in participant observation in the classroom 2-3 times per week taking field notes and gathering audio recorded interviews, camcorder video recordings of whole class and small group interactions, screen captures of work products, video capture (screencasts) of ongoing student computer use, and audio/video capture through student webcams (further discussed in Bhatt & de Roock, 2013).

Tripod-mounted camcorder recordings were coordinated along with groups of simultaneous screen-in-screen webcam with on-screen video recordings of individual
students sitting in groups. Therefore, the data was quite “dense” in that data at a given moment came from several co-present student computers along with the interactions around them. Semi-structured interviews with students combined with surveys focused on out-of-school technology use, including by their families, along with broader contextual information. Transana (Woods & Fassnacht, 2012; Woods & Dempster, 2011) was used to organize data and conduct analysis, as it is designed to handle paired video data through a specific conversation analysis approach, including the ability to synch simultaneous videos and, then, transcribe them to a single transcript.

Video data constituted the center point of analysis, which was ongoing throughout fieldwork and guided data collection. Each episode was “gisted” through a general description of activities, tagged with keywords according to phenomena of interest derived from field notes, then assembled into collections by keyword. This allowed me to examine sequential occurrences of literacy practices over time. Following Heath et al. (2010), I focused on particular literacy events occurring over 10 to 60 minutes to sync simultaneous video files and then develop a more detailed log of activity. Finally, I focused on segments of approximately 10 to 30 seconds for repeated viewing, transcription, and in-depth analysis. Influenced by a “tree-wise and forest-wise” (Moss et al, 2009) approach, the microanalyses were in constant conversation with broader insights derived from fieldwork. In presenting the data in academic journals and presentations, I follow others (e.g., Büscher, 2005; Heath et al., 2010; Goodwin & LeBaron, 2011; Mondada, 2006, 2012) in utilizing screenshots along with descriptions of participant action and sometimes conversation analysis style transcripts.
Co-Construction of an Underlife

Classroom interaction seems to have two lines of activity. There is one line, organized and orchestrated by the teacher, who writes schedules on the board, gives assignments, gives reads and punishments, and the like. These activities are foregrounded, public, and dominant. Interferences in their flow are thwarted, suppressed, and punished…. A second line of activity is the peer social interaction that is maintained through such channels as covert talk and secret notes. It’s [sic] content is meant for peers, not adults. (Gilmore, 1986, p.156)

By analyzing this second line of activity, Gilmore emphasizes the literacy competence displayed by marginalized youth through an African American street rhyme called “Steps” and also through playing Dungeons and Dragons, displaying abilities far beyond those that students were expected to have by the teacher within the classroom.

Similarly, I selected and reconstructed the event narrativized in the above vignette to illustrate what, in my years of working with marginalized youth across the globe, has always struck me as sophisticated uses of digital media in commonplace ways.

The girls created a space for themselves to make meaning by playing with ontological categories, in particular the boundaries between classroom and secretive activities. They actively and collaboratively negotiated these boundary ontologies through interactions with each other, their teacher, their computers, the audio and video recordings, and the researcher. These elements—both human and nonhuman—were actively constructed as interactional participants. They leveraged the boundaries as part of an ongoing pattern of identity play, indexing of previous identity discussions, negotiating of gender and other social norms. In doing so, the girls displayed a significant awareness of the nuances of the seen and monitored, and the unseen, who
was doing the observing, and of the leveraging of various technical affordances to accomplish their actions.

More broadly, sanctioned classroom technology use largely continued an estrangement from situated learning practices (Lave & Wenger, 1991; Lave & McDermott, 2002) through the teacher’s digitizing the status quo by moving standardized test preparation and worksheets to digital forms. However, MSP game was appropriated by the girls to engage in literacy and identity work that was otherwise denied to them in the classroom space. Their enactment of literacy and identity was transformed when laptops facilitated their peer network’s entanglement with a pre-existing assemblage of other adolescents and software developers. Their engagement with these networks contrasts orientations that Bereiter (2002) describes as a belief mode, where official (school) epistemological claims are valued, and a design mode, where value is on “whether knowledge and beliefs are adequate to tasks we need to carry out and how knowledge can be put to use” (Gee & Hayes, 2010). For example, a digital poster created by two of the girls contrasted sharply with the design of their online profiles and avatars. From a pedagogical perspective, the girls’ in-game practices reflect and build broader digital literacies and participation skills (Jenkins et al., 2006) that were generally lacking with in-school and informal practices, such as the digital poster. Such a gap indicates the importance of understanding and drawing on the non-curricular digital media practices of students.

This is not just about practices that constitute informal literacies, but also about socially situated literacy practices within emergent communities. Goffman’s (1961)
concept of an underlife—the equivalent of a city’s underworld within a social setting—is particularly relevant here. His focus is on what he calls total institutions, organizations that strictly control the movement and freedoms of their inhabitants like prisons and mental hospitals. He describes ways that inmates regularly preserve their individuality through regular and coordinated surreptitious acts, which also occurs in less totalistic institutions. He argues that such “reluctance is not an incidental mechanism of defense but rather an essential constituent of the self” (p. 319). In other words, resistance to institutions is a central part of identity formation.

While Goffman focused on the underlife of a mental hospital, schools have similar functions as what Goffman (1961) explained as instrumental formal organizations: “a system of purposely coordinated activities designed to produce some over-all explicit ends” (p. 175). The end product of schools is a particular concept of an educated citizen. Goffman focused on how ways foregoing or engaging prescribed activities “in unprescribed ways or for unprescribed purposes is to withdraw from the official self and the world officially available to it…[t]o prescribe activity is to prescribe a world; to dodge a prescription can be to dodge an identity” (p. 187). In the case of Jen, Sara, and Marta’s *sub rosa* practices, such active management of social space to open up possibilities of alternate identities were accomplished while still performing the “official” self of the successful student. To understand better the game play central to the classroom underlife, in particular not to diminish the serious nature of it, I adopt Salen and Zimmerman’s (2008) definition of play as “the free space of movement within a more rigid structure” and Bogost’s (2008) uptake of the concept in discussing play as a
possibility space created by a network of constraints and “not rooted in one social practice, but in many social and material practices” (p. 120). In the analysis that follows I focus on the practices undertaken to create such a classroom underlife in collaboration with a broader network of interlocutors.

**Under the Teacher's Surveillance**

One major consideration for students strategizing in maintaining an underlife was awareness of surveillance by the teacher (and other school authorities) through visual gaze, tattle-tales, and the network monitoring software, called *Vision*, that allowed teachers and administrators to bring student on-screen activities onto their own computer desktops. Mrs. Jones was innovative among teachers in using the technology to project student work on the board during lessons, but this also meant she was adept at finding students (sometimes not even in her classroom at the time) engaging in proscribed activities, often computer game play. On several occasions, she called out student illicit or off-task activities during class before booting them from the network temporarily. When this occurred, the logo of the software appeared on the student screen: a full screen, close photograph of a woman’s eye in black-and-white. Mrs. Jones frequently began project work time, including during the period of this event, by saying such things as, “*Vision will be on the entire time today,*” as a warning to stay on-task.
Consequently, student on- and off-task activities were conducted with consistent awareness of being under multiple layers of surveillance. Such underlife boundaries were therefore not simply recognized but actively constructed and negotiated. The girls routinely organized their on-screen activities around awareness of surveillance through the network, including which wireless network to which they were connected (*Vision only worked on some*). While playing, the girls would frequently maintain other tabs open in case they needed to switch over to conceal gameplay. When walking away from their computers, they would switch over to the tabs. In Figure 2, Marta had walked away from her laptop to the desktop, but returned briefly to switch tabs.

The girls were clear about what should be heard or not heard by the teacher. Figure 3 shows Sara bringing her finger to her mouth after Erica nearly exposes their gameplay:

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<td>What her name is?</td>
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<td>2</td>
<td>S</td>
<td>Shh::° [F3]</td>
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Figure 2. Marta clicks onto a new blank tab on her browser to hide gameplay.

Figure 3. Sara shushes a girl who risks revealing their surreptitious gameplay.

Figure 4. Jen moves smoothly from gameplay into conferencing with the teacher.
Having overheard discussions throughout class time about avatar names, Erica is making a bid for inclusion in the conversation (Line 2) but displays a lack of competence for maintaining the underlife. She loudly asks, “What her name is?” Even after she is shushed by both Sara and Jen, they do not answer her question and she is not brought into participating but maintained as an observer. One minute later, Erica orients to the camera (Figure 7) and alerts Sara to it as a threat, who dismisses it based on her previous orientation with her co-conspirators.

Finally, the ability to transition seamlessly from one activity space to another was crucial for maintaining the classroom underlife. In Figure 4, Jen had been playing MSP along with her classmates, but, when called over by the teacher, she had her story cued so she was prepared to “continue” working despite having not yet composed anything during the class time. Interestingly, the engagement with text is dramatically different in her conferencing with Mrs. Jones, who essentially dictated most of the rest of her story for her, then let her know how it should end.

**Co-constructing an Underlife with the Researcher and Research Tools**

The girls also enroll the researcher (me) and research instruments to establish and negotiate the boundaries of their underlife. As I discussed in Article 1, we should not understand such reactivity as somehow distorting the data; awareness of enrollment in the research process is always present in research. Rather, such interactions can be used to better understand the meaning-making practices of participants, including in this
case the boundary negotiation of their underlife. In keeping with my participant observation approach, the girls frequently interacted with me during the research, making comments and responding to my questioning during gameplay. They also routinely referenced, oriented to, and interacted with my research tools, including the camera, microphones, and screen capture software. Such actions are frequently ignored or dismissed as fading away in interaction analysis and video analysis work (Caronia, 2015).

Figure 5. The girls negotiate the threat of researcher gaze in various interactions

As the girls are negotiating the login for their new character, Marta is writing down “Movistar” with a marker as the header for recording their login credentials. Jen pretends to read it out aloud: “motherfucker” followed quickly by “just kidding.” There is a pause of disbelief while Jen covers her mouth playfully and makes eye contact with Sara (F), Marta throws down her marker, and they all laugh. Marta says, “Don’t say that!” but quickly returns to her writing. Jen replies, “Sorry,” but without much conviction, although she glances past Marta directly at the camera then up and past Sara towards the teacher. She then returns to the game collaboration. Sara, who is typically more worried about staying on task, glances at the teacher nervously, then alerts her companions to the presence of recording devices, first pointing to and
commenting on the wireless mic and then the camera. Jen and Marta ignore Sara, except for subtle cues and comments from each to drop what we can presume they felt was uncool behavior. For example, while Sara points at the camera, Jen maintains her gaze rather than following her gesture, then continues interacting with Marta.

Figure 6. Marta “feeds” the camera as Jen looks on.  
Figure 7. Sara, previously concerned, dismisses Erica’s concern about camera.  
Figure 8. Jen switches off researcher recording before closing her computer.

Similar engagements with research instruments occur during the same recording session. In Figure 8, Marta “feeds” her frozen fruit drink to the camera while Jen looks on, noting the action then looking over at Marta and laughing. Marta later repeats the action, accidentally getting some of the treat on the lens, then decides after a quick exchange with Jen to alert me to her accident. In Figure 9, Erica (after being shushed for speaking too loudly, as transcribed above) physically points to the camera’s presence with her thumb (pointing directly into the lens), attempting to alert Sara to its threatening gaze. Sara, based on the footing established with her friends, dismisses the threat. In Figure 8, Jen has left her conference with Mrs. Jones near the end of class and begins shutting down her computer before halting to ask me if she should stop the
recording. In doing so, she displays an ongoing awareness of being monitored across both underlife and official classroom spaces. To take this further, in engaging with research instruments, students “establish an epistemic difference between reality (the recordable) and data (the record), and position themselves as the epistemic authority in charge of such a decision” (Caronia, 2015, p. 153). Specifically, they enroll the research process in negotiating the boundaries of their landscape of social actions and identity development, including the classroom underlife, by collectively orienting to the recordable and the record as distinct from the reality to be viewable by teacher.

Co-constructing an Underlife with Each Other, Game World, and Tools

Students in the classroom (and in the school more generally) often passed time engaged in varying levels of unapproved activities on their take-home laptops, These ranged from decorating their desktops to playing video games, often between classes, but even more regularly during class time. The time between classes and at lunch was more often used for group socializing, courting, and sports or horseplay. During class, students consistently strategized about such things as minimizing time spent on classwork and maximizing the amount of socializing and other “off-task” behavior. These were centered by activities on their computer, as they could maintain the illusion of remaining busy from the point of view of the teacher. One main activity was playing video games, mostly casual single player platformer games consisting of individual play sessions without the ability to save progress. Such games generally lack the more situated and complex literacy practices documented with other games, such as massively multiplayer online role-playing games (MMOs) (e.g., Gee, 2003; Steinkeuler
et al. 2012). While these games are commonplace in classrooms with more privileged students, they were markedly absent in this classroom—only one student (the only white student in the classroom) actively played them at home. The girls’ gameplay in *Movie Star Planet*, while not an immersive roleplaying game environment, opened up possibilities listed above for situated learning and literacy practices.

![Figure 9](image.png)

*Figure 9. Marta and Jen collaborate physically and digitally to level up a new character.*

The girls had been playing *Movie Star Planet (MSP)* for several months after Marta learned about the game from a cousin visiting her house to use her school laptop. She introduced it to Jen, who quickly became the group expert and spread the practice through her own family network, including her older sister and younger brother. They introduced it to a few other friends in school, but Jen was exclusionary of girls she had not introduced to the game herself, leveraging it to maintain her own centrality in their peer group. Over time, the game became an increasingly important part of the girls’ peer interactions. It extended their in-person interactions and their offline material semiotic resources to an online environment affording synchronous and asynchronous
interactions. For example, in Figure 9, Marta and Jen (in a continuation of the community avatar creation process described above) pause their parallel gameplay to coordinate the friending process; Marta sends a friend request then directs her gaze at Jen to ask if she received (A), causing Jen to open her friends list and respond that she has not (B). In Article 2, I discuss particular ways the girls’ social and literacy practices were shaped by laptop hardware and software along with the MSP’s game design and the community embedded within it. I have summarized the ways their *sub rosa* digital literacy practices were both shaped by and instrumental in carving out the classroom underlife with a focus on gender play.

*Dichotomies*

There is a temptation here merely to contrast the practices of the underlife and official classroom spaces, thereby reinforcing notions of formal and informal (digital) literacies. However, these separate worlds in the classroom can be seen to be in flux with and mutually constitutive of each other, of the same ecology, and reinforcing of each other. I am arguing for the importance of boundary construction to undo dichotomies, not to reinforce the view that they exist separately from one another. In my first chapter, I addressed the tendency of research to “purify” the messy realities of our world and research contexts. My analysis here has attempted to capture and theorize the complexity of the literacy practices using the concept of boundaries through the lens of situated social practice.

Approaching learning through *a priori* constructs of oppositions and difference, like old and new ways of learning, is not productive. Sefton-Green (2014), building on
Derrida’s notion that any valorisations of one half of a binary makes the other abject and empty (Derrida & McDonald, 1982), argued that “by constructing informal learning as other and different, the literature works to construct a tension between the idea of qualitatively new and different kinds of learning and a normative construction of schooled learning” (p. 9).

Goffman (1961) distinguishes two types of underlife practices: disruptive ones where the intent of the participant is to disrupt the institution radically or to leave it altogether, and contained practices that fit into “existing institutional structures without introducing pressure for radical changes and which can, in fact, have the obvious function of deflecting efforts that might otherwise be disruptive” (p. 200-1) while also being an “essential constituent of the self” (p. 319). Through evading the teacher’s gaze and classroom curriculum, the subject girls’ contained practices helped to maintain the smooth running of the classroom even while undertaking the kinds of activities that allow for the development of the individual and communities of practice within totalistic institutions.

The actions of the girls certainly do not constitute grand acts of subversion, but such playfulness—even carnivalesque (cf. Bakhtin, 1986; Roth, 2009)—is a crucial part of socialization. Knowledge, as a heteroglossic phenomenon, lies at the center of the centrifugal and centripetal forces of language—a process, grounded in social practice, that diverges into diversity but also converges into regularity. From a Bakhtinian perspective, there are always many discourses operating “centrifugally” in opposition to the official, “centripetal” discourses (Gottleib, 1989). In other words, even as the
classroom curriculum sought to centralize and regularize student digital literacy practices, the actions of students constantly diversified and fragmented practices, while creating smaller “whirlpools” of centralization within communities of practice, such as the subject girls’ gameplay.

Monologism, which is a characteristic of teacher-centered classroom discourse, is closely related to authoritative discourse, the word that is already acknowledged and where “consciousness is monologized…primary dialogic relations to others’ words are also obliterated” (Bakhtin, 1986, p. 163). This is not simply a discourse of power (a hegemonic force), but any discourse that is characterized by a totalizing nature (unfragmented, coherent, logical) and by finalization (in its shielding from dialogism) – even counter-hegemonic discourses can be (or become) authoritative discourse, such as orthodox Marxism. Even as it is engaged by other voices, it maintains itself as authoritative, unchanging, and immutable.

The point here is not to romanticize student resistance or suggest that surreptitious activities are always or even generally positive or pro-social. In fact, in Goffman’s (1961) discussion of mental hospital inmates, many of the documented behaviors not generally “healthy” behaviors – like taking contraband drugs – but nor was Goffman attempting to trace the benefits or detriments of the various underlife activities. Rather, he discussed such activities as central to developing a sense of self even when one’s every action is constrained by the overarching institution. I add to this that certain surreptitious behaviors like sub-rosa literacy practices (Gilmore 1986), along with the actions taken to carve out a space for them, display sophisticated practices beyond what
is expected or is displayed in the official classroom curriculum. However, this should emphasize rather than obscure the kinds of surreptitious practices with little apparent benefit and especially those with potentially negative consequences. For example, other student gameplay lacked the social and situated qualities of MSP. Additionally, students engaged in activities like plagiarism, copying and pasting stories they found on Internet to submit as their own. However, even such boundary crossing activities inform the ways educators might design for the boundaries.

**Implications**

I follow Kress (2000) in viewing design as existing “on a chain of processes of which critique is one: it can, however, no longer be the focal one, or be the major goal of textual practices” (p. 160). Design implications should therefore be the outcome of a critical analysis. I emphasize designing for the boundaries based on this and other empirical examinations of learning at those boundaries. Akkerman and Bakker (2011) identified four dialogical learning mechanisms of boundaries:

(a) identification, which is about coming to know what the diverse practices are about in relation to one another; (b) coordination, which is about creating cooperative and routinized exchanges between practices; (c) reflection, which is about expanding one’s perspectives on the practices; and, (d) transformation, which is about collaboration and codevelopment of (new) practices. (p. 150).

My own work frames the possibility of reaching diverse global youth through work with teachers—whether in educational interventions, teacher education, or educational curricula (including those embedded in software)—to acknowledge, leverage, and support student digital (and other) funds of knowledge. Empirical research on learning at the boundaries should be used to reframe the ways we think about students’
practices in the school space. This is important because we have oversimplified views of school practices that in turn define what successful performance looks like and lead to its being rubricated, quantified and put into boxes. However, Goffman (1961) found that institutions regularly attempt to legitimate and incorporate contained practices selectively and, thereby, “regain control and sovereignty even at the loss of some of the participant's obligations” (p. 196). Classroom underlife activities are therefore not always practices we would want to integrate directly into the classroom; doing so would likely be counter-productive as it would likely result in the loss of joy in the activity itself. In working with educators and educational systems, I urge the following:

1. Recognize the practices occurring across boundaries and using boundary objects.
2. Validate and examine those practices without destroying their meaning.
3. Strengthen the practices without appropriating them, for example through digital literacy instruction that allows youth to better leverage their informal experiences for meaningful learning. This means creating connections with diverse youth literacy practices to improve literacy education within school address to issues of the digital divide outside of school. In particular, educators can contribute to combatting what Jenkins et al. (2006) call the participation gap, the “unequal access to the opportunities, experiences, skills, and knowledge that will prepare youths for full participation in the world of tomorrow” (p. xii).

Conclusion

Teachers know as well as any researcher that students are heavily engaged with digital media for personally meaningful pursuits both outside of and within their
classrooms. However, in this era of high stakes standardized testing, they rarely have the bandwidth to engage with this reality and typically end up treating such activities as distractions and even threats to their own teaching objectives.

In this paper, I have leveraged the notion of boundaries to argue for a more nuanced understanding of the everyday digital literacies of minoritized youth and the types of communities of practice that exist in classrooms. The subject girls’ surreptitious play of a MMOG allowed them to carve out a third space within which to situate sub rosa digital literacies and tap into broader communities of practice, affinity spaces, and engage in identity play. The broader projection of this work casts light on the everyday sophisticated practices of minoritized youth in a way that does not further perpetuate notions of unbridgeable divides while offering actionable solutions and ways of informing teacher practices to draw on (without appropriating) student practices. I conclude, therefore, with a list of ways to move from critique to design.

**Transcript Notation**

My transcripts follow a slightly modified Jeffersonian Transcription Notation including the following symbols:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Name</th>
<th>Use</th>
</tr>
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<tbody>
<tr>
<td>[ text ]</td>
<td>Brackets</td>
<td>Indicates the start and end points of overlapping speech.</td>
</tr>
<tr>
<td>=</td>
<td>Equal Sign</td>
<td>Indicates the break and subsequent continuation of a single interrupted utterance.</td>
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<tr>
<td>(# of seconds)</td>
<td>Timed Pause</td>
<td>A number in parentheses indicates the time, in seconds, of a pause in speech.</td>
</tr>
<tr>
<td>( )</td>
<td>Micropause</td>
<td>A brief pause, usually less than 0.2 seconds.</td>
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<tr>
<td>. or ↑</td>
<td>Period or Down</td>
<td>Indicates falling pitch.</td>
</tr>
</tbody>
</table>
Arrow

? or ↓ Question Mark or Up Arrow Indicates rising pitch.

, Comma Indicates a temporary rise or fall in intonation.

- Hyphen Indicates an abrupt halt or interruption in utterance.

>text< Greater than / Less than symbols Indicates that the enclosed speech was delivered more rapidly than usual for the speaker.

<text> Less than / Greater than symbols Indicates that the enclosed speech was delivered more slowly than usual for the speaker.

° Degree symbol Indicates whisper or reduced volume speech.

ALL CAPS Capitalized text Indicates shouted or increased volume speech.

underlined Underlined text Indicates the speaker is emphasizing or stressing the speech.

:: Colon(s) Indicates prolongation of an utterance.

(hhh) Audible exhalation

. or (hhh) High Dot Audible inhalation

( text ) Parentheses Speech which is unclear or in doubt in the transcript.

(( italic text )) Double Parentheses Annotation of non-verbal activity.

[letter] Bolded Curly Braces References an image at moment of capture within corresponding speech or action.

Works Cited


