Co-constructed from the Margins: The Intersection of Design, Practice, and Technology within Changing Classroom Social Space

by

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Biographical Sketch

The author was born in Fredericksville, Maryland, USA. He attended Houghton College and graduated with a Bachelor of Science in Elementary Education in 1996. After completion of this degree, he worked as an Elementary Spanish Enrichment teacher, a computer coordinator, and a technology integration specialist. He then attended Pepperdine University and completed his Masters in Online Educational Technology in 2000. After working as a teacher in Rochester City School District, he became an elementary enrichment teacher. The author then applied his online masters to his field and ran an online High School program for five years from 2002-2007. He continues his career in a position where he provided and oversaw professional development and technology integration for teachers.

He began his doctoral studies in education at the University of Rochester’s Warner School of Education in 2005. He conducted a pilot study that was the basis for the work in this dissertation under the direction of Professor Joanne Larson in 2008-2009. In this same year, Professor Nancy Ares involved the author in developing and writing a chaptered book in which the author was first author on the chapter about social space and youth cultural practices. The author completed a research assistantship in 2007-2008 with Professor April Luehmann that resulted in multiple publications relating to online technology and its use in science. He pursued his research into technology integration under his advisor, Professor Luehmann.

The following publications were a result of his work relating to both social space and the use of technology for learning.


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Abstract

This study examines the complex and inter-related intersection of design and practice within the classroom social space when participatory, spatial technology is introduced. Specifically, this work offers an exploration of one teacher’s attempt to influence change in classroom practice by introducing the affordances of Multi-User Virtual Environments (MUVEs). This study helps to reframe the discussion regarding technology integration from the prevalent cause and effect approach that has provided the field with mixed results to an approach focused on influence and relationship of the complex classroom environment. By building on the framework of social space I provide an intentionally expansive lens on practices and outcomes that focuses on the design work of the teacher and the practices of all participants in the construction of a single classroom social space, spanning physical and virtual spaces.

This study is an ethnographic, qualitative research study utilizing data collected as part of a three-year project. I focus on one class period from the second year of data collection to ask the research questions: 1) “How do changes in spaces shape the social practices over time?”, 2) “In what ways does the teacher’s design for the use of Second Life influence the trajectories of practice in her room?”, and 3) “What was the nature of the social space that emerged from the changing social practices?” I use data from participant observation, video recordings of sessions, computer-screen recordings, focus group interviews, open-ended interviewing, and participant reflection. Drawing on Lefebvre’s social spatial theory, I applied de Certeau’s theory of practice within my analysis. I found that initially the design of the teacher decentered the classroom social space with the use
of Second Life providing students the room to move and develop creative practices. Although the teacher’s practices of redesign subsequently centralized activity and marginalized some practices, the students’ practice trajectories made use of the margins to appropriate the classroom social space and develop the practices initially intended by the teacher. This study suggests that we can learn more by shifting our focus from the designed activities to what else happens when technology is introduced into classroom social spaces.
Contributors and Funding Sources

This work was supervised by a dissertation committee consisting of Professor April Luehmann and Professor Nancy Ares of the Department of Teaching and Curriculum within the Warner School of Education, and Professor Kurt Squire of the University of Wisconsin. The student completed all work for the dissertation independently. No funding was provided for the purpose of completing this research.
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Chapter 1: Introduction to the Need

Although a diverse body of research has engaged with understanding the potential and impact of technology use in classroom settings, approaches to classroom technology integration are often hindered by an oversimplified dichotomy of tool and users that results in the omission of insights that we now understand to be critically entwined with the learning process. Through this study, I add to the field of education research with a focused study of the development of classroom social space through lived practices when introducing online, interactive technologies. I examine the interactions and practices of one teacher and her class of students in an urban high school as they begin using an online program called Second Life. Second Life is a multi-user virtual environment (MUVE) designed for users to control the actions of a 3-D character (i.e. avatar) in order to interact with other avatars and the online environment through a computer.

I examine how one teacher attempted to shift the process of design in her classroom from a traditional, primarily teacher driven practice to one that provides space for and recognizes student design work. This study examines the process of design as it emerged over time and the development of practices within this classroom as multi-level, ongoing processes involving all participants of the classroom social space.
The goal of this first chapter is to explicate the need for my work given my own experiences with technology integration in school settings and the existing research on classroom learning and participation with technology. I will argue that there is a need for further, in-depth research examining the integration of immersive, online technologies within classroom curriculum and social space. I will expand on the work already done around the design for the use of immersive technologies (e.g. Beck & Perkins, 2014; Kim, Lee & Thomas, 2012) from both a practice (e.g. Ares, 2008; Merchant, 2012) and social space (e.g. Johnson & Levine, 2008; Leander, Phillips & Headrick, 2010) lens. My study provides insight into the ongoing research surrounding the design of learning afforded and inspired by multi-user virtual environments.

**My Influences as a Researcher on this Study**

In qualitative research, the focus of the research questions and the approach used to answer those questions are influenced by the researcher (Denzin & Lincoln, 2011). My study was not developed in isolation, nor do I suggest that the design of this study is removed from my initial professional interests and academic inquiries. In this section, I recognize the professional experiences that have shaped this study and the theoretical assumptions that I have embedded into the design of this study. I do this to make visible the influences that I, as a researcher, have brought to the research design process.

**Professional experiences leading to this study.** There is a critical need in the field of K-12 education for research that provides a better understanding of what happens (and does not happen) when a teacher introduces online technology into the classroom with a transformative vision for instruction in mind. My confidence in this statement
arises not only from the literature review which will be presented in Chapter Two but also my experience in utilizing technology in education myself and supporting other teachers in their use of various technologies. In multiple roles and positions as a practitioner, I have been responsible for working with teachers to integrate technology in their classrooms. Throughout my time in these roles, across multiple organizations there was an overarching tendency for teachers and school leaders to focus on the activity of using the technology. Yet, many teachers expressed difficulty in realizing desired instructional goals through the use of the technology and only a few of the teachers expressed feeling successful in changing classroom learning practices. Aligned with Anderson’s (2008) review of multiple, large-scale studies regarding the implementation of new technologies into schools, I have seen that there are mixed results regarding the realization of reformed classroom practices through the introduction of technology.

**Theoretical assumptions grounding my study.** Although I will describe my theoretical framework in Chapter Three, I will outline the underlying understandings that are interlaced throughout the work of my study to ground the reading of this introduction and the literature review. First, drawing on Lefebvre (1991) and de Certeau (1984), I recognize that social space is co-constructed through the practices of all participants encompassing physical, social, and spatial elements. As such I define social space as sites of social interaction defined by a consistent group of individuals interacting, a shared interactional structure, a common location of interaction, and a common history of interactions. Second, drawing on de Certeau (1984), Lankshear and Knobel (2006; 2011), and Scribner and Cole (1981) I see that through social practices, the resources and
elements of the social space have meaning. I define social practices as socially evolved and meaningful ways of doing things or getting things done. Third, technology is not an isolated tool. The specific 3D virtual environment technology I am looking at is both an interactive resource embedded in the social space making certain practices more available to the participants of the space and a virtual space with its own potential practices.

I draw on de Certeau (1984) and Lefebvre (1991) to understand design and production of social space in my final theoretical assumptions. The assumptions and conceptions of the teacher, in her role as the designer of the activities, can make certain practices more or less available to the participants in the space (de Certeau, 1984). As such, I define design as the intentional or purposeful attempt to influence practice by planning time, developing activities, and/or arranging resources. Finally, although the teacher may have the role to design the activities within that environment, all participants enact the practices and therefore social space itself through their individual, and at times, group practice trajectories. I define practice trajectories as practices of a person or group that are connected by interests, desires, or purpose over time that can suggest but not predict likely or potential practices that will emerge. It is thus through the ongoing design of the resources of the space and the ongoing use of these resources as a part of the practice trajectories that the actual social space is constructed.

Each of these assumptions is not singular and separate but rather inter-relates with the others. Social space is practice in place over time. It is the whole of that shared location encompassing the structures, resources, people and the histories of each as they relate to each other. These combine together to impact the practice trajectories (or likely
practices which will emerge) within that space. At the same time, this space is made up of those practices over time. As practice constructs social space and the social space influence practice, I cannot merely look at one to study the other. They are intertwined and I am left with a “which caused which” scenario reminiscent of the classic question of which came first: the chicken or the egg.

To describe the nature of something is not to describe its components, rather the essential elements of each and how they interact to create that nature. As such, I focused on the interactional structures of the space, the resources of the space (such as the technology), the people in that space and how these changed and influenced one another over time.

**Defining the Need for this Study**

Drawing on my own background and the driving purpose of this study, I will now define the need in the broader field for this type of study. The literature on technology integration is broad and has done much work to advance our understanding of how we use technology as a support of learning. I develop the need for this study by understanding how technology is changing our current approaches, what we know about those approaches, and finally, how this study can build on the work of successful approaches to further our understanding of the design and take-up of connected, participatory technologies.

**Technology is changing everyday practices.** The discussion around the impact of technology and specifically Internet-based applications on daily life can be seen in the general media (eg. Healy, 2007), specific reports by various organizations (eg. Rainie,
This discussion has also moved into the discussion of these tools for use in education with both trade magazines (eg. Dembo, 2008), reports (New Media Consortium, 2014), research (eg. Lankshear & Knobel, 2007; Leander, 2007), and of course through these web-based sites and tools themselves (eg., http://weblogg-ed.com, http://simteach.com/wiki). Although frequently this discussion on the ‘latest’ technology treats it as a single variable impacting change, this approach partitions the use of technology from other interactions and reifies boundaries that exist only as constructs of some of the participants.

*Participatory technologies shift practice and mindset.* The changes to practice have been further shifted as participatory technologies, sometimes called Web 2.0 or social media, have become a part of everyday life. These technologies, such as blogs, wikis, and social sites, support interaction with others throughout the world (Carney-Strahler, 2011; Falloon, 2015; Gratton & O'Donnell, 2011) and allow for the production and sharing of content in new and diverse ways (Green, Inan, & Maushak, 2014; Rahimi, van den Berg, & Veen, 2015; Rowsell, & Harwood, 2015). The potential for learning through these technologies has been well researched (Deng, & Yuen, 2011; Luehmann, & Frink, 2012; Maranto, & Barton, 2010; Schuck, Aubusson, & Kearney, 2010). The very design of these technologies assumes a different conception of knowledge and social interaction for learning (van’t Hooft, 2008). Lankshear and Knobel (2006) described this change in understanding as a shift from Mindset 1 to Mindset 2. Differences in thinking represented within Mindset 2 that are key to my research include the decentering and
dispersal of knowledge, the redefinition of space as open, continuous and fluid, and the movement from production as an item created by an individual to services offered by non-finite, group participation. The shifts in practice brought on by these radical changes are not slow and steady either but are rather fluid and ongoing. As Taratino and Tosoni (2013) explained:

Producing the space we inhabit [through our practices] meant that the more people were in a space, the more rapidly and more unpredictably it changed. And the more diverse the people, the more diverse the way they thought, and what they did in space. Therefore, the more rapid and unpredictable were the changes in practice (para. 1).

**Increase in technology with spatial qualities and affordances.** In addition to participatory technologies that support a rapidly increasing set of new and diverse practices, there is an increase in the technologies that have spatial qualities and affordances. Mobile and handheld technology has changed where and when you are able to participate in the diverse communities and practices already highlighted (Leander, Phillips & Headrick, 2010; Prior, 2014; Stald, 2008) or to bring the information and resources with you (Ehret & Hollett, 2013; Green, Inan & Maushak, 2014; Squire, & Dikkers, 2012). Augmented reality provides the opportunity to merge or at least overlay the digital resources and knowledge with the physical space (Gaydos & Squire, 2012; Liao & Humphreys, 2013; Martin, Dikkers, Squire & Gagnon, 2014). Virtual environments and those multi-player, online games with similar qualities continue to provide opportunities to create and control the environment in which you interact with
others from around the world (Beck & Perkins, 2014; Kim, Lee & Thomas, 2012; Schifter & Cipolione, 2013; Squire, 2008; Young, et al., 2012; Zhong, 2011).

By understanding these participatory and spatial technologies as part of everyday practices, it problematizes the idea that technology is merely a variable that can be located in a specific instance, setting, or interaction. Through my research, along with others (Ares, 2013; Squire, 2008), I show that by having the technology embedded in what we do, we are doing more than changing the mediating tools of discourse, but also the space and the potential practices that have become available.

**Mixed results when using technology as a part of the classroom.** The purposes for integrating these new technologies into the classroom vary from the most common purpose of academic improvement (e.g. Kember, et al, 2010; Knapczyk, Frey & Wall-Marincik, 2005) to the frequently cited secondary purpose of motivation (Jong, Mejiden & Berg, 2005; Sutcliffe & Alrayes, 2012) to an increasing number listing the purpose as being a requirement from administration (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur & Sendurur, 2012). However, the focus of this work is on the change in pedagogical practices (Huang, Rauch, & Law, 2010; Johnson & Levin, 2008) and the change in student practices (Kluge & Riley, 2008; Dieterle & Clarke, 2007) with a move to student-centered practices. The development of participatory, online technologies, provided the opportunity for expanding more student-centered approaches (Hew & Cheung, 2013). Both my own experience and the literature identify that there is only a small portion of teachers who are focused on the use of that technology for a reform-based change in classroom practice (Livingstone, 2011; Mills, 2010b; Penuel, Tatar & Roschelle, 2004).
As I will outline below, within these studies there are mixed results for the realization of changed practices with use of technology.

Online, participatory technology use has positively impacted teachers’ implementation of more student-centered approaches (Inan, Lowther, Ross & Strahlo, 2010). There have been positive impacts identified with the use of many participatory technologies such as social media (Livingstone, 2008; Neo, Tse-Kian & Eshaq, 2007), or blogging (Luehmann & Frink, 2009; Luehmann & MacBride, 2007; Robertson, 2011), or the focus of my study, Second Life (Dalgarano & Lee, 2010; Merchant, 2012; Zheng & Newgarden, 2012).

Although there have been findings that suggest the use of these technologies can shift the practices of students, there has been some literature that has found no change or even the reinforcement of traditional practices. Donnelly, McGarr and O’Reilly (2011) in their work found that those teachers who tended to be student-centered used the technology to become more so, those who tended to be teacher-centered scripted activities more, thus reducing the freedom of the open-ended virtual space being used. Vojak, Kilne, Cope, McCarthy and Kalantzis (2011) found in their review of the use of various writing assessment software that in most classrooms the typical, old practices were reinforced by the new technology rather than being transformed by it.

Yet, even with the reinforcement of old practices, the work of some researchers suggests that perhaps the analysis was too early in the process. Sheehy (2004) summarized the learning from her project in suggesting that,
the Building project revealed that inserting new objects and new practices into school could not simply replace old practices. Students themselves required old space to make new space. They could not begin a new practice absent of past practice. They had to use the familiar to build the new (p. 111).

Sheehy’s work suggests that the complexity of the classroom space is such that simply attempting to shift the classroom by introducing technology and a new activity does not typically result in successful or long-term changes to the classroom practices.

Although many have found that the technology enabled transition to a more student centered approach, others suggest that the variable is not the technology nor even the purpose but rather is the way that the technology was used and the teacher’s understandings of how students learn (Hennessy, Wishart & Whitelock, 2007; Herrington, Oliver & Reeves, 2002; Hew & Cheung, 2013; Murphy & Manzanares, 2008). I also recognize, along with others, that the take-up of the practices by the students is an additional and critical part of the change process when using participatory, connected technologies for reform (Ares & Evans, 2014; Luehmann & Frink, 2012; Squires & Dikkers, 2012).

My inconsistent findings within the literature mirror many multiple large-scale studies and meta-analysis that have also found mixed results for changes in practice with the introduction of technology (Anderson, 2008; Livingstone, 2011; Means, Toyama, Murphy & Baki, 2013; Mills, 2010b). Perhaps the most interesting finding within the literature on the use of online participatory technology in the classroom is that we do not
yet have a clear understanding on *how* these technologies can effectively shift instruction and learning (Livingstone, 2011; Mills, 2010).

**A triad of lenses to shift the direction of research.** Although the results have been inconsistent, there have been some analytic lenses that have provided insight into what is happening as technology is brought into the classroom for the purpose of changed practice. A *practice lens* (e.g. Ares, 2008; Merchant, 2012) focuses on the practices of the students for engaging with the technology rather than merely understanding the activities and impact of those activities. A *social space lens* (e.g. Johnson & Levine, 2008; Leander 2003; Leander & Kim, 2003) focuses on the development of and movement through the social spaces afforded by the technology as a means of learning. “*Designed experiences*” lens (e.g Squire, 2009; Turkay, Hoffman, Kinzer, Chantes, & Vicari, 2014) understands the role of design for technology to be that of a purposeful experience or space to support the learning rather than an assumption of change due to the technology itself.

Working from these three lenses, I frame an underlying and critical element for the field: a study that seeks to understand classroom practices with and around technology should not be rigidly bounded by the technology as a tool, the classroom as a context or the participants in roles as students or teachers. In artificially bounding the research in these ways, we create specific and yet overly simplified (and therefore unhelpful, perhaps even counterproductive) claims about practices, roles, and impact.

This shift from technology as the tool which causes actions within the classroom, to that of participants interactions drawing on the practices made available by technology across lives and spaces is the critical one I make with my research. As such, my work
shifts the focus of research from understanding the technology and its use as a tool to understanding a space, that of a classroom social space, and the impact of purposeful changes to that space. This moves into a needed area of research, which does not create strict boundaries between online/offline and teacher/student by over-centralizing technology as an object or tool. This work defines the classroom and the online space as a single social space that is constructed through the practices of participation and technology as neither a tool nor a separate space but rather as a part of the social space and the practices involved.

**Contributions to the Field**

The purpose of this work is to add complexity to our understanding of technology’s role in the co-construction and ongoing shaping of classroom learning and practices. We need to apply our current understandings of technology integration to the integration of newer technologies that have spatial aspects. These technologies will have different affordances for learning and these affordances will make different practices and spatial configurations available. My study is designed to build on the work of others in areas such as teacher design intention, development of learning practices, student-teacher role negotiation, and classroom social space construction within the context of a technology that is both mediating tool and space for interaction.

Specifically this study is designed to explore issues of changes in classroom social space by explicating one teacher’s attempt to influence change through instructional design (initial and ongoing) that was inspired by affordances of a particular technology; and the changes in practices in a given social space that resulted from a classroom
community’s participation with and through this particular technology.

This work will contribute to the field in a number of ways. First, as I demonstrate in this chapter and my literature review, there is a need to better understand how K-12 teachers attempt to influence changes in classroom practice through the introduction of technology. I will show that the design of the classroom social space and the way the technology is positioned can have a greater influence on the development of student-centered practices than the planning of lesson activities. Second, by building on the framework of social space as a means to access the classroom’s interactive structure, I will utilize an intentionally expansive lens on practices and outcomes that focuses on the design work of the teacher and students in the construction of a single classroom social space, spanning physical and online spaces, through changes in practice. Third, my approach to analysis, based on my lens, contributes a different way to answer questions regarding the teacher’s desired changes and how these changes are or are not realized. I trace the initial desired practices of the teacher and the developing practices of the students across multiple spaces through time with the use of a parallel video analysis. This approach centers the practices, rather than the spaces as the focus of study. Finally, by providing insight into the integration work as a co-construction process of design and practice trajectories, I will provide suggestions on design for teacher practitioners looking to bring technology into their classroom.
Summary

As a change in the elements within a classroom social space, the introduction of an emerging technology can still be seen as having the ability to bring potential and desired practices into the classroom social space. My study looks at the introduction of online, immersive technology to the ongoing creation of the classroom social space overtime. Through the use of a practice analysis I will provide a nuanced view into the ongoing development of a classroom social space through the design and take-up (or not) of various affordances offered by this technology. It is with this focus that I ask my research questions:

1. How do changes in spaces shape the social practices over time?
2. In what ways does the teacher’s design for the use of Second Life influence the trajectories of practice in her room?
3. What was the nature of the social space that emerged from the changing social practices?
Chapter 2: Literature Review

Understanding the Field

I turn to the literature in order to understand the broader research and theoretical context in which this particular study is situated. Although the research I reviewed typically examines specific technology in a specific setting, it is important to remember that the technology and the setting are situated in the broader, ever changing landscape of new technologies and changing societal practices. As such, I first will look at the broader field of study from which I am working.

With any research field, the field itself stems from older fields. As my area of focus is relatively new, I find it is important to understand the research that is currently being conducted from fields from which it emerged – i.e. different fields that have contributed to our understandings of changes in practices surrounding technology in the classroom. Work with this focus has been known under many names including Computers in Education (Kulik & Kulik, 1991), Information Technology in Education (Voogt & Knezek, 2008), Technology Mediated Learning (Gupta & Bostrom, 2009), Instructional Technology (Seels & Richey, 1994), Information and Communication Technology (ICT) (Stevenson, et. al., 1997), Computer-Supported Collaborative Learning (Roschelle & Clancey, 1992), and Educational Technology (Connor, 1970). Research involving more recent technologies, like mine, has rebranded itself using terms such as New Media Literacy or New Literacies (eg. Kress, 2003; Lankshear & Knobel, 2003; Street, 1998) or Digital Technology and Learning (Price, Jewitt & Brown, 2013).
Each of these names is not merely a different label but emerged from a different underlying theory of both use and study. Livingstone, Van Couvering and Thumim (2008) suggest that when newer fields emerge from specific research traditions (such as media literacy versus information literacy), those traditions provide focused points of view that can be helpful but also limiting. de Freitas and Griffiths (2008) suggested that when studying converging fields (such as gaming and other media and Internet technologies), there is a great need to situate these opportunities for research within the technology specific fields and also in comparison to studies of other related technologies. Guri-Rosenblit (2005) in her study of distance education and eLearning, argued that when not only the technology but also the practices and purposes surrounding these two became distinct, they have developed into different areas of research. All of these suggestions focus on the technology and the field of use the practices emerged from as the defining characteristics of a field within technology. I situate my work within that being done on new and connective technologies.

These technologies are often linked to New Media Literacies (Lankshear & Knobel, 2003; 2006). Although a rich strand of research and literature, the underlying tradition from which these research has developed is that of literacy studies and as such has a specific focus around language communication and meaning making. Due to my research questions and the technology I am addressing, I have focused my study in a different manner, looking to the development of social space and practice. As I will demonstrate in this chapter, I am aligning my study with a spatial turn as this area not only aligns with my study but is also an area ripe for further exploration.
Categories of the Literature

Prior to examining the research, I will first clearly describe the parameters I worked under for my research review as a part of this fluid field emerging from multiple strands of literature. I began my literature search of articles utilizing different search strands related to the classroom (including learning, education, and school) and technology (including virtual worlds, Internet, online, Web 2.0, social media, MUVE, and Second Life) intersecting with my theory (social space, practice, and design). Although I did take into account the journal’s rankings according to SCImago Journal Rank, I did not use this as a filter but rather ensured other articles supported the findings or concepts presented within those articles from lower rated journals. I coded the titles, abstracts, and findings to identify common themes and underlying concepts from which to not only organize the literature but also to better define my study.

As I built this corpus of literature, I filtered each study by its relevance to my work in its relationship to a) informing my theoretical framework or b) having similar characteristics as my specific context. I then aligned the purpose of my study to this corpus to understand what has been said in relation to my area of concern and focus. Through this process, I found that the literature spoke to the components of my study differently.

Affordances of Technology for Practice and Space.

There is a large body of work within educational technology that looks at the affordances of technology for various practices. I identified 131 articles that had a major focus on the affordances of a particular technology for learning. Many more of the
articles also discussed the affordances of the technology within the broader focus of the article; however, these 131 spent significant time developing an argument for specific affordances connected to the learning process.

As I begin with affordances, I will first look at how affordance is addressed generally and then look at the specifics of my study in terms of space and practice. It is important to define affordances within the context of the other, often confused, concepts of features and use (Wallace, 2004). Affordances are not observed behaviors of those using the technology. They are rather the possible practices that could occur with the technology as it is being used and the emergent practices that developed as it was being used (Delgarno, 2012). In this way, I define affordances as neither strictly of the technology nor of the user but rather existing between the two, drawing on the functionality of the technology and the myriad possible intentions, choices, and resources of the user.

Within the literature, there has consistently been the question of whether or not there are clear affordances for the use of technology in schooling. Framed slightly differently, the question becomes: “Should we use technology in classrooms?” Although there are many who suggest we need to shift away from the simplistic, “should we” and move toward a more nuanced question of “when should we” (Hastings & Tracey, 2005; Tamim, Bernard, Borokhovski, Abrmi & Schmid, 2011), there are still some articles which have and continue to question the ability to realize affordances of technology in the classroom setting (Churchill, 2007; Facer, Sutherland, Furlong & Furlong, 2001; Luckin, et al, 2009; Moore, 2007). Yet, even within these articles, there is the recognition
that there are indeed affordances for learning with any technology. The articles more often question if there are clear benefits for formal education (Churchill, 2007), if the affordances can be realized within the current models of education (Moore, 2007), or if there might be specific structures in the school or classroom which need to be established for the technology to provide true affordances (Luckin, et al, 2009).

Some of those changes highlighted in the literature surround changes to the conceptions of space (Lankshear & Bigum, 1999; Leander & Sheehy, 2004) and time (Duncheon & Tierney, 2013), ethics (Gunkel & Hawhee, 2003), how we learn and what is knowledge (Lankshear, 2003), and reading and writing (Street, 1998) as multiliteracies (The New London Group, 1996). These changes in conception are supported by elements introduced by the technology such as new strategies and dispositions as required by the Internet (Leu, Kinzeu, Coiro & Cammack, 2004), new discourse practices (Gee, 2003), different semiotic contexts (Kress, 2003; Lemke, 2002), multimodal contexts (Hull & Schultz, 2001), and the ability to provide and create just-in-time or differentiated instructional content (Ayres & Langone, 2005; Garthwait, 2004; Hung, 2002). As these changes and strategies are made available to the student, so they provide affordances for the teacher as an opportunity to support to design for and support student take-up within the classroom. In this way the affordances of the technology for a change in practices around learning are also affordances for pedagogical changes. However, the affordances remain only possibilities until the technology is made available within the classroom itself and there are classroom activities associated with the technology. My research will help to better understand how these affordances become (or do not become) a part of the
classroom social space through an analysis of the influence of teacher’s’ design and changes to the social space through the technology on the lived practices.

*Affordances of MUVE technology.* I found that through the literature on technology in education, each technology has affordances that are unique to it. Within the literature on virtual worlds in education, there is a similar interconnectedness between the designed affordances and the way that these affordances are taken up. Three specific affordance-practice links can be seen consistently in the literature:

Virtual places: The idea that place is formed through interaction within a social group (Sutcliffe & Alrayes, 2012) “working toward a given goal” (Robbins-Sponaas & Nolan, 2006, 432) and that there are practices that thus draw on the resources of that space and that of real-life to construct them, but are also essential in constructing the space (Bers, 2001; Boostrom, 2008; Robbins-Sponaas & Nolan, 2006; Roush, Nie & Wheeler, 2009). As a virtual space, this space allows for greater movement across the landscape of the environment for exploration of the space and the resources that have been developed there (Bulu, 2012; Delgarno & Lee, 2010; Savin-Baden, 2013).

Object-orientation: Understanding that the social space is represented through the use of objects but is also developed through the interaction with these objects in the virtual space (Bers, 2001; Boostrom, 2008; Robbins-Sponaas & Nolan, 2006). The ability to create in this space develops a greater level of ownership and freedom to rethink both the space and the practices in that space (Delgarno & Lee, 2010; Kim, Lee & Thomas, 2012).
Avatar presence: The idea that in virtual space, the avatar is the way one reflects on, performs or even plays with 'who I am in this space' within a social context (Bers, 2001; Boostrom, 2008; Robbins-Sponaas & Nolan, 2006; Roush, Nie & Wheeler, 2009) and as such creates a greater connection or sense of presence for the user (Bulu, 2012; Mørch, Hartley, Ludlow, Caruso, & Thomassen, 2014; Schifter, Ketelhut, & Nelson, 2012).

These three affordance-practice links provide the first level understanding on how movement towards virtual world spaces impacts the development of new or different practices. The affordances of the design of the technology are only a piece of the way that these spaces allow for but also restrict the roles and available practices. I will now look at what we have come to learn about learning practices as influenced by technology.

**Practice and Technology**

Through my analysis of the readings in the Internet-based research, I identified three ways by which the Internet is new and thus reworks the use and meaning of other technologies and practices. The first aspect is that of access. By access I not only refer to access to information, which can change the dynamics of information capital, but also, I refer to access to the variety of people, cultures, and potential identities associated with Internet use (e.g. Alvermann & Heron, 2001; Gee, 2003). The second aspect is that of connectivity. Connectivity references both that of connection to others and among others as well as the interlinking of information and ideas through the web structure of the Internet (e.g. Hegedus & Kaput, 2004; Hegedus, Moreno-Armella, Dalton, Brookstein, & Tapper, 2013; Stroup, et al, 2002;). The final unique aspect is that of the expanded ways
that relationships and information are being constructed through multiple modalities (e.g., Collins, Neville & Bielaczyc, 2000; Kress, 2003). These aspects fundamentally change the ways and potential ways that interactions and information are and can be developed through the use of the Internet. Shifting the potential for interaction allows for different practices to develop and become available. Lankshear and Knobel (2006) discuss this shift in the way we view interactions through web mediums. They recognize that although the Internet allowed for these practices, that there were specific applications, such as Blogs, Wikis and other interactive online sites that led to truly different practices becoming embedded in the interactions taking place. Thus, there is a need to understand how these new technologies afford practices that are uniquely changing current engagement and thus the social space the practices are constructing.

**Technology and changing social practice.** In general, the primary posit of this line of research is iterated in the *Handbook of Research on New Literacies* (Coiro, Knobel, Lankshear & Leu, 2008) and suggests that technology allows for new ways of creating and making meaning. Additionally, they argue that these new ways are continually changing and being rapidly distributed which fosters an environment in which the ways that we can be understood to be literate and participate in learning practices are not only shifting, but will continue to shift and change. Thus, the understanding of learning must encompass a wider spectrum of practices while at the same time remaining flexible to allow for new practices, which may or may not become a part of the ways individuals, groups, or the broader society describes itself and the knowledge resources available to it.
**Shift from outside practices to in class practices.** There is an ever-increasing group of research exploring how online, interactive technologies provides affords new learning practices. The question in this type of research asks: “How are people learning with these technologies outside of school settings in ways that are productive but not occurring in the traditional classroom?” The research in this arena, which focuses on such web-based tools as blogs, Facebook, Twitter, and other social networks or media, looks at practices out of the school space to see what students do with these technologies when not under the constraints of teacher and curricular goals (Gee, 2004; Hull & Schultz, 2001; Lankshear & Knobel, 2007). The question that is then asked is: “How do practices change when we attempt to bring these affordances into our classrooms through the inclusion of technology” (Mills, 2010b)? Through my study, I will contribute to this body of literature that has attempted to bring technology into classroom for the purpose of shifting practice.

**What we know about shifting practice.** In examining this literature, there is one overarching theme that emerges: *changing practice shifts roles of the participants.* Although a simple concept, this theme threads throughout the literature and can be seen in shift from the teacher as the focal point and mediator of interaction within the classroom to that of the technology and students mediating and developing practices.

**Shift of students as consumer to producer.** An important aspect of social media, Web 2.0, MUVEs, and other participatory technologies is that the user is able to produce (Horst & Hjorth, 2013; Lankshear & Knobel, 2011). This is an essential shift in the role of the user (participant) to not only consume the technology and its artifacts, but to also
create the artifacts or even the actual content of the technology itself. For example, the idea of the students as producers rather than just consumers lines up with the practices seen emerging from teenagers’ lives outside of the school day as well (Moore, 2007; Hill & Vasudevin, 2008; Ondrejka, 2008).

The affordance for producing with technology even in the school setting can be seen across multiple technologies including Web 2.0 (Rahimi, van Den Berg & Veen, 2014), iPods (Ehret & Hollett, 2013; Roswell & Harwood, 2015), tablets (Black, 2014; Fallon, 2015; Hu & Garimella, 2014), video (Furman & Barton, 2006; Green, Inan & Maushak, 2014; Snelson, 2014), and gaming (Denner, Werner & Ortiz, 2012; Robertson, 2012). Students are able create learning from resources of their choosing, (Lawson, Bodie & Houlette, 2006; Welch & Brownell, 2000), produce and create media (Brown & Green, 2007; Furman & Barton, 2006; Garthwait, 2007; Lankshear & Knoble, 2007), and construct and present their own understandings and learning (Maor, 2001; Orion, Dubowski & Dodick, 2000; Stahl, Finke & Zahn, 2006).

_Shift from teacher mediated lessons to technology mediating student ownership of learning_. The second shift in practice that has been found to shift the roles within the classroom when incorporating Internet-based, interactive technologies is a change in responsibility for the learning taking place. This can be seen in a research across a variety of technologies where the technology is identified as providing the connection or mediation between learners; a role typically taken by teachers in a classroom setting. One of the primary changes in learning practices involving the use of wikis has been students’ collaboratively development of expertise rather than simply receiving knowledge directly
from the teacher (Carney-Strahler, 2011; Grant, 2009; Joubert & Wishart, 2012; Reich, Murnane & Willett, 2012). Blogs have been identified as facilitating the reflection of one’s own learning and learning process (Davies & Merchant, 2006; Duffy & Bruns, 2006; Sim & Hew, 2010) and connecting with other learners to build understandings (Bortree, 2005; Luehmann & Frink, 2009). The use of mobile technologies has been found to further develop the social relationships and collaboration on various projects that began in schools (Holden & Sykes, 2012; Klopfer, Squire & Jenkins, 2002; Roschelle & Pea, 2002; Thomas, 2006). Multi-User Virtual Environments (MUVEs) are able to provide student-centered learning opportunities in a way that is not only different than a traditional classroom setting but also can allow for more effectively addressing student ownership of their learning (Dieterle & Clarke, 2007; Kluge & Riley, 2008; Sakatani, 2005). Other studies have found that Multi-User Virtual Worlds have been useful in learning the skills of navigation and building in-world through students collaborating together (Childress & Braswell, 2006; Di Blas & Paolini, 2014; Hamalainen, 2008; Schroeder, 2002; Sutcliffe & Alrayes, 2012).

As I further investigated this idea of student ownership of the learning, I found that many studies also revealed an increasing inclusion of those who were not typically a part of the development of practices in the classroom. Studies have shown an acceptance of other cultures and perspectives as they utilized digital technologies (Eskicioglu & Kopec, 2003; Hung, 2002; Koehler, Yadav & Phillips, 2005; Moore, 2006). There has been an increase in participation with those typically reluctant to be involved in the classroom through the use of educational software (Heidig & Clarebout, 2011; Ito, 2008;
Changing Classroom Social Space


As technology is introduced into the classroom setting, there is a shifting of roles that can happen (Ares, Stroup & Schademan, 2009; Shea & Bidjerano, 2010). I will add to our understanding of the shifting roles in the classroom through practice by showing how students took up and developed practices as a part of the shifting role within the social space rather than as a part of the activity designed by the teacher or solely due to the affordance of the technology.

Social Space and Technology

A second focus of my study is how technology influences and is influenced by the social space. Social space is a complex concept that I will discuss in further detail in Chapter Three. It is also a concept that has had a variety of definitions and uses in understanding classrooms and technology. I will examine the literature looking at technology as a space and the ways that we have come to understand how technology influences space. I suggest that examining technology as a part of the classroom social
space provides an opportunity to move away from concepts of dualities and causalities that typically confuse the discussion of technology integration.

**Online as space.** Technology has been viewed consistently as a tool in much of the discussions of the use of various technologies in education (Dede, 2008; Gupta & Bostrom, 2009; Law & Sun, 2012; Livingstone, 2011; Ross, Morrison & Lowther, 2010). However, this view tends to limit the analysis of the role of technology in classrooms to a *function of what is being doing with it*. Other literature has looked at technology as a space (Jansson, 2013; Leander, Phillips & Headrick, 2010; Sevej, 2006; Walls, Schopiyer & DeVoss, 2009). This allows us to analyze technology by looking at *how technology supports or shapes the development of social space.*

The interactions online are occurring within a web or network of interactions spreading out into what some call virtual space, others online space, and still others cyberspace. Regardless of the term used, researchers and theorists have attempted to define the interactions conducted through online technologies as places or spaces. Whereas Kia (2008), Ikegami and Hut (2008) and Cabiria (2008) tend to portray virtual space as providing an environment for new ways of building community interactions, Turkle and Papert (1990), Hughey (2008) and Notley and Tacchi (2005) discuss the ways that conceptions of the use of technology impacted participation structures available to those interacting online. This is seen more specifically in the literature around MUVEs. McPherson (2002) draws on the work of Stone (2002) to understand cyberspace or virtual space as “a kind of public theatre” which is “a base for the cyborg” or the self extended through the computer (p. 118). This is a subtle shift that provides cyberspace not as a
passing space, but as a location that is stable in what it offers and does for the user. Crane (2000) suggests that:

“It’s a strange space, cyberspace, this non-place that becomes ever more ubiquitous and ever more essential to our already mediated reality—or the reality of our many mediations. Conjoining the hard materiality of technologies and the fuzzier logics of imagination, it exists not so much as a discernible entity but as a “site” in the most metaphorical sense, of cultural, social and of course technological tension.” (88).

Boellstorff (2008) takes this one step further suggesting that “virtual worlds are places, not networks: the transition from the 2-D Web to the 3-D Web heralded during the period of my fieldwork was really an addition of online places to online networks” (p. 247). Thus, the virtual world is not a thing, nor a structure, but rather a space, containing not only the immediate actions, but also the histories of action, which are lived.

**Space with technology as multiple.** Through my examination of the literature around space and technology in the classroom, I found an underlying concept: *Technology fractures space.* This concept is not new. As first presented by Lankshear and Bigum (1999) in reference to cyberspace, the fractioning of space is what happens when interactions occur in digital spaces that are connected to other physical spaces and to other digital spaces. As such, there is no longer a clear boundary around the space of interaction, nor are all the interactions occurring in a single location.

Although there are a number of ways that this multiplicity of space is framed in the literature, there is a consistent underlying idea that technology changes the way that
space is perceived and interacted with. I found that space is consistently treated as multiple. Below I have outlined the ways that space is treated as multiple along with how this helps us better understand space and the use of technology.

**Creation of another space.** Most often seen with studies of online or hybrid courses, technology has been viewed as creating a new space for the classroom (Bedi, 2011; Cavus, Uzunboylu & Ibrahim, 2007; Gaydos & Squire, 2012; Means, et al, 2013; Tallent-Runnels, et al., 2006). These new spaces are separate and distinct from the classroom space. Activities conducted in them are specific to that space, as it contains spatial resources not available in the classroom. Studies in Second Life have treated the virtual world as a separate space that can allow for new and different opportunities (Jee, 2014; Lin, Wang, Grant, Chien & Lan, 2014; Mørch, Hartley, Ludlow, Caruso & Thomassen, 2014; Zheng & Newgarden, 2012). These studies may be looking at a single course that utilizes technology, however, the online space is examined as a separate and unique aspect of the course (Kim, Lee, Lee, & Thomas, 2012; Motiwalla, 2007). This approach understands the uniqueness of the technology in the resources that it is providing for Social Space creation.

**Connection to other spaces.** Technology in the classroom has been found to connect the classroom to other places or people beyond the typical spatial boundaries (Cox-Peterson & Melber, 2001; Fletcher, Tobias & Wisher, 2007; Klemm & Tuthill, 2003; Kuiper & Volman, 2008; Livingstone, 2008). The technology in this circumstance connects multiple locations. Each space is unique, but the technology allows access to some of the resources (knowledge, interaction, etc.) of the other space. Video
conferencing with an expert or another class is a good example of this type. From a concept of the classroom, the space has changed from one isolated or self-sufficient spaces into connected or inter-dependent spaces. This approach recognizes that there is a complexity to the production of the social space due to the physical/spatial component that grounds the participants in their physical location while they access other spaces.

**Multiple, overlapping spaces.** Other researchers have addressed how technology allows the production of multiple, overlapping spaces. How the spaces overlap has been conceptualized in a variety of ways including; in the form of private, public, and group spaces (Brady, White, Davis & Hegedus, 2013; Kaput & Roschelle, 1998; Vahey, Tatar and Roschelle, 2006), as a personal bubble of space (Prior, 2014), and through the digital overlaying the physical with augmented reality (Liao & Humphreys, 2013; Squire & Dikkers, 2012). The technology is utilized to develop space(s) with those who are utilizing the technology in the same way. However, as some of the technological, interactional, or physical resources of the spaces that develop are shared, these spaces overlap. Understanding space in this way helps to explain how individuals can be in physical proximity but participating in different and diverse practices. This approach provides insight into how multiple social spaces can develop within one location.

**Transient space.** Finally, some researchers see that technology truly fractures space and that it is the experience (Erstad, 2014), presence (Bulu, 2012), or focus (Jarmon, 2009; Schroeder, 2002) of the individual that is the thread through these spaces (Davis, 2006; De Souza e Silva & Delacruz, 2006; Huijser, 2008; Klopfer, Squire & Jenkins, 2002; Leander, Phillips, Headrick-Taylor, 2010; Squire, 2009; Squire & Dikkers,
Understanding social space as dynamic with the various aspects of the social space in transition, the continued use of a location as a defining aspect of social space is problematic. Within this conception, space is no longer a bounding concept in defining social space. This approach recognizes the idea that it is practice that actually connects the multiple paths of the individuals and so problematizes the static social concept of ‘space.’

**Space and social space.** The way space is addressed affects the way that the social space is understood. In my study, I address the classroom social space as one social space as defined by practice. I recognize, with the research, that technology does indeed fracture space. However, although the technology does disrupt the typical experience of space, there is theoretical and analytical power in exploring how these disruptions are taken into the practices that are constructing the social space. Through this, I am recognizing the positioning within that space across the technologies that is occurring when the teacher and students take up different aspects of the technology and the affordances of those technologies.

**Design and Technology**

From understanding the affordances of technology for the classroom, the way that technology has and could influence practice and the way that it affects space and thereby social space, I look to the design of the classroom social space when including technology. Design and technology within the classroom has been addressed with a number of foci. Some researchers do look at how to improve the technology or software itself (Bakker, Paddenier & Werkhoven, 2003; Dickey, 2005; Heidig & Clarebout, 2011;
Ieronutti & Chittaro, 2007). Other researchers focus on the design of the software or educational game and its impact on the learning, motivation, or academic achievement of those using the technology (Heidig & Clarebout, 2011; Law & Sun, 2012; Shieh, 2012). This research focuses on a specific element of technology design, such as the point of view of the player (Bakker, Paddenier & Werkhoven, 2003; Dickey, 2005) or the use of a teaching character in the program (Heidig & Clarebout, 2011; Ieronutti & Chittaro, 2007) or the virtual space created (Dede & Ruess, 2003; Tarng & Liou, 2006). Other research has looked at the underlying assumptions of the design of the technology and how those assumptions can be leveraged for supporting classroom instruction (Habgood & Ainsworth, 2011; Stahl, Finke & Zahn, 2006; Squire, 2008) or at times may represent a unintended discriminatory positioning of some students through use of software or sites that have underlying assumptions that essentialize or don’t represent typically marginalized students (Everett & Watkins, 2008; Nakamura, 2002). The critical factor for effectiveness mentioned in each, however, is not the design of the software, but rather the design of the classroom instruction (Dickey, 2007; Garris, Ahlers & Driskell, 2002; Squire, 2006; Virvou, Katsionis & Manos, 2005; Virvou & Katsionis, 2008). Thus, understanding the design of the software or online space and its assumptions is an important aspect of the integration process, but it is not primarily this design process that needs to be understood when bringing technology into a classroom setting.

**Designing for change in student and teacher practice.** Although researchers recognize the potential for change in teacher and student practice through the use of technology (Windschitl, 1998; Johnson & Levin, 2008; Huang, Rauch & Law, 2010;
Mills, 2010), the literature is still working through how to design for these changes. There are multiple approaches to integration, multiple instructional design frameworks, and multiple factors to consider when designing for change through the use of technology.

**Multiple desired outcomes when designing with technology.** Teachers do not integrate technology unless they have a purpose or desired outcome (Donnelly, McGarr & O’Reilly, 2011; Hew & Brush, 2007). Across the literature on designing for technology integration in the classroom, there are some frequently recognized types of outcomes.

1) **Content knowledge** seen in research including: the use of 3D imaging to improve understanding and recognition of shapes (Ainge, 1996), the use of web-based presentation technologies to enhance retention of content delivered (Kember, et al, 2010; Knapczyk, et al, 2005), and the use of multi-media authoring tools for science knowledge acquisition (Orion, Dubowski & Dodick, 2000).

2) **Conceptual understanding** seen through research such as: the use of three dimensional virtual reality models to improve conceptual understanding of astronomy concepts and phenomena (Barnett, Yamagata-Lynch & Keating, 2005), the use of a virtual lab which allows student designed experiments to provide fuller mastery of the concepts within the class (Donnelly, McGarr & O’Reilly, 2011), the use of simulation technology to move students to more advanced mathematics (Roschelle, et al, 2010), and the use of media and media literacy to enhance and refine knowledge and conceptual understandings across many disciplines (Scheibe, 2004).
3) Domain specific skills seen in such research as: the use of Virtual Reality to develop design skills (D’Souza, et al., 2011), the use of Mulit-User Virtual Environment to develop scientific inquiry process and skills (Galas & Ketelhut, 2006), the use of gaming environment to improve vocational skills (Hamalainen, 2008), and the use of networked technology to produce new math discourse and practices (Ares, Stroup & Schademan, 2009; Stroup et al, 2002).

4) Generalizable learning skills seen in such research as: the use of series of informational websites to develop inquiry skills (Molebash & Dodge, 2003), blended learning involving mobile technology and learning management systems to improve problem solving (Yen & Lee, 2011), Multi-User virtual environments to improve problem solving approaches with language (Jee, 2014), Second Life to improve collaboration (Di Blas & Paolini, 2014), and use of digital media to build decision making skills (Maier & Fisher, 2006).

Multiple design approaches when designing with technology. There have been multiple ways presented in attempting to frame the design of classrooms and classroom instruction with technology. There are metaphors, such as choreography (Hirst & Cooper, 2008) or orchestration (Roschelle, Dimitriadis & Hoppe, 2013) to conceptualize the complex task of effectively utilizing technology in the classroom to spur reform. However, as Roschelle, Dimitriadis, and Hoppe (2013) discuss, these metaphors may not be useful for actual research even as they attempt to grapple with the important process of melding planning and ‘in-the-moment’ action that is required by teachers. As such, multiple instructional design frameworks have been developed (Deng & Yuen, 2011;

In looking across these frameworks, there are some consistencies of approaches that can be seen reflected in studies of technology integration. Some design approaches start with the desired learning and match the affordances of the technology that are sent o best support that learning goal (Luehmann & Frink, 2009; Robertson, 2011; White & le Cornu, 2010). A second approach is the reverse of the first, whereby specific affordances of a technology are identified and then activities or learning goals are aligned to those affordances as a way to see if those affordances can be realized in the classroom (Jee, 2014; Lin, Wang, Grant, Chien & Lan, 2014; Mørch, Hartley, Ludlow, Caruso & Thomassen, 2014; Zheng & Newgarden, 2012). In other approaches, desired practices are identified as developing along-side/through the technology in outside of school settings. The technology is brought into the classroom to foster the development of those same practices in the classroom (Black, 2007; Coleman, 2011; de Souza e Silva, 2006; Gee, 2004; Hull & Schultz, 2001). Others have identified the potential of technology to change practice, however there is not an appropriate match between the curriculum need and the technology. Thus, after identifying the curriculum need, a technology is developed that will meet that specific need (Dede & Ruess, 2003; Shin, Sutherland, Norris, & Soloway, 2012; Tarng & Liou, 2006). A final approach that I saw consistently used, though much less frequently due to its complexity, is to look at how to connect the design of learning, technology design, and research (Ketelhut et al., 2010; Roschelle et al, 2010). This
approach doesn’t start with a single starting point but attempts to look at design as a holistic, ongoing process rather than a design and implement approach. It is the value of this approach that led me to look to the use of social space as a lens for examining the design process of the teacher in my study, regardless of her actual approach.

**Design factors and considerations.** Within the field there is more consensus on what influences the design of the implementation than there is on how to implement. The critical factor for effectiveness mentioned in many studies is the design of the classroom instruction (Dickey, 2007; Garris, Ahlers & Driskell, 2002; Virvou, Katsionis & Manos, 2005; Virvou & Katsionis, 2008). However, there are other considerations for design that influence resulting practices in desired ways. These considerations can be divided into those relating to the practices and conceptual understandings of the teacher, the access to and affordances of the space and technology, and the technological and cultural practice and knowledge of the students.

*The practices and conceptual understandings of the teacher* (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur & Sendurur, 2012; Inan & Lowther, 2010; Joubert & Wishart, 2012). This includes the pedagogical believes and practices of the teacher (Joubert & Wishart, 2012; Kiraz & Ozdemir, 2006; Judson, 2006; Livingstone, 2011; Moore, 2007), teacher’s knowledge and confidence in the use of the technology (Balanskat et al, 2006; Becta, 2004; Osborne & Hennessy, 2003), and the knowledge, ability to use the technology for learning (Bauer & Kenton, 2005; Piper, 2003; Wozney, Venkatesh & Abrami, 2006).
The access to and affordances of the space and technology. As already discussed, the affordances of the technology are an important consideration when looking at the use of technology in education (Ainley, Enger & Searle, 2008; Zhao, Pugh, Sheldon & Byer, 2002). Access to both the technology and the affordances is obviously also important (Ertmer, 1999; Hoffman & Novak, 1998; Hoffman, Novak & Chatterjee, 1995; Norris, Solloway & Sullivan, 2001; O’Mahony, 2003; Pelgrum, 2001). However, access is more than a mere function of having the technology. Researchers have identified other barriers to access such as the structure of the day (Rice, 2007b), the level of difference in the practices for teacher and students (Zhao, Pugh, Sheldon & Byers, 2002), and access to the social and organizational resources to make the use meaningful (Warschauer, Knobel, & Stone, 2004).

The technological and cultural practices and knowledge of the students. Research has identified that there are frequent assumptions about the students’ knowledge and experience with technology that is misleading when designing for instruction (boyd, 2008; Leu, Atlaya, & Coiro, 2002; Stern, 2008). When designing for instructional use of these technologies, we need to be thoughtful about the backgrounds of the students that could become involved the technology is integrated (Ares, 2013; Cabiria, 2008; Notley & Tacchi, 2005; Warschaur, Knobel & Stone, 2004). We need to be even more thoughtful as to the integrity of attempting to realize the affordances of these personal technologies and outside of school practices by requiring they be utilized within the structure of the educational institution (Ares, 2006; Maranto & Barton, 2010; Schuck, Aubusson & Kearney, 2010; van den Beemt, Akkerman & Simons, 2011).
Foregrounding the work of the final key consideration, I present design not as a process solely in the control of the adults; researchers, technology developers and teachers but rather as one of the practices of the social space. Through the work of my study, I illustrate how design is an ongoing dialogue in the classroom that is not determined by the lesson activities but rather the practices that are developed as they draw on the resources made available through these key considerations.

**Implications of the Literature Review for My Study**

The research surrounding the implementation of online technologies into the classroom provides a foundation on which to build my study. The research on affordances in general is fairly rich, outlining the many affordances for learning. When viewed as a whole, the affordances in the literature recognize both space and practices being expanded, multiple, and hybridized based on the environment of use.

I found that research in design and its impact has primarily focused on academic achievement with some examination on changes to teacher and student practice. The literature that looks to understand classroom pedagogy or learning practices has had extremely inconsistent results. The field has developed literature around the factors impacting the implementation of technology in the classroom that might have caused these mixed results. The focus of these implementation factor studies have become more sophisticated as the field has learned from these studies and attempted to reduce barriers to successful implementation. However, overwhelmingly the focus has been to understand those factors restricting the design/implementation cause and effect. My research will look at the interactions and decisions influencing the take-up (or not) of the
potential practices (affordances) of the technology and the space as influenced by the design work of the teacher.

We have come to know much more about what could happen (affordances) and why it doesn’t happen (factors) in terms of the use of technology in education than we do around what actually does happen (design and impact). As such, my research is designed to help further the conversation through a focus on what happens within the practices and social space of a classroom as influenced by the design of the teacher. I base my study on those researchers who focus on practice and the construction of the social space from this practice with technology as a critical aspect of that space and potential catalyst for change of practice. This shift in focus understands technology as a part of a larger system of interaction and as such can better examine the impact of its introduction on that system of interaction.
Chapter 3: Theoretical Framework

This study is designed to examine the complex interactions across physical and online spaces by exploring the designed juxtaposition of new practices enabled by online technology and existing practices within educational social spaces. In the most basic sense, the purpose of this study is to understand what happens to the development of social space when an online place for interaction is made a part of the classroom through purposeful design.

Although the study is focused on the classroom, it is situated within shifts of practice that are occurring in the broader society. The changes in technology have had a transformational impact on the way society constructs itself (Giddens, 1991), the way that meaning is made (Lankshear & Knobel, 2007) and even the way that relationships and identities are constructed (Gergen, 1991; 1994). However, through this study, I would like to shift the way we view the role of technology for learning in school and with this changed view, better understand how new learning practices can develop within classroom settings. I align my work with Warschauer and Ware’s (2008) claim that technology "is better understood not as having an impact, but rather as helping reshape a broad social ecology, and thus affecting learning in ways that are unforeseen" (p. 219). As already identified in this paper, the introduction of technology does not have a cause and effect relationship with changes to student practice. Frequently, technology is introduced into a classroom within the context of not only existing practices but also expected or hoped for realization of specific affordances. It is how these expectations or desired outcomes are designed for and then lived out that is central to my study.
Construction of Meaning through Technology

I move away from a cause and effect understanding of the interactions in my study by situating this study in a socio-historical tradition which understands human interaction as socially constructed, drawing upon cultural resources and mediated through tools or artifacts (Vygotsky, 1986; Wertsch, 1991). This construction of meaning can actually be thought of as "socially distributed cognition" (Wertsch, p. 27) which is held within the social context, suggesting that it is distributed not only among the current social interactions and activities but the historical-cultural experiences of that group.

Selwyn (2011) argues that seldom is the social aspect of technology analyzed when discussing young people, technology, and education. He recognizes that much of the research attempts to develop a causality or as he terms it a deterministic element to the use of technology in education. Selwyn posits that through the essentialization of the issue of technology’s impact, other issues involved with classrooms implementing technology are silenced. I suggest that this is a difficult balance to maintain, that of both making the complex something that we can research while at the same time not oversimplifying to the point of exclusion. In order to address this aspect, Selwyn proposed that research must be conducted that explicitly builds on social theories. It is partly these concerns with essentialism and determinism that suggest a movement towards a conception of technology as a part of the historically-informed, social practices within the classroom space.

As seen in the literature review, often the research for understanding the use of technology in the classroom has been approached by either tracking the use of the
technology from out of school to its potential uses in school or by tracking the introduction of the technology as an additional tool into that setting. This line of thinking creates a single, focused directionality to the process. The intersection of practices is much more complex than a single trajectory however. Scollon and Scollon (2004) studied the way that interactions changed and shifted when online technologies were introduced into a college course of study. In their research they discovered that there was a complexity of interactions that was found with any change of practice, but much more specifically when online technology came into play within the educational setting. The use of the online technology was connected to a change in the structure of the class, the ways that people interacted, the types of assignments, and even how students and the teachers thought about the course itself. These different aspects of the study became enmeshed as one would affect the other. They suggested that, in order to understand the interactions occurring, it is critical to purposely focus on specific trajectories which best provide meaning to the interactions or changes of interest.

I would suggest that to understand the interactions around technology, we must first understand the social space in which the technological tools are utilized and the various trajectories of practice that influence that context rather than focusing on the tools themselves as they are brought over into the setting. In looking at a classroom in which new technologies are being introduced, my study and analysis encompass these multiple trajectories of shifting practices but also recognize that the interactions emerging from these trajectories have underlying connections that provide meaning within the social space of that specific classroom.
A part of the changing social space in this study is the introduction of the virtual space, Second Life. Although the term virtual space is often used to differentiate online interactive space from physical interactive space, within this study I do not imbue this term with the concept that virtual space is an antithesis to physical space or that they are spaces to be studied in isolation. I merely use the term “virtual space” to identify a category of spaces which have different spatial resources available to them. This is done much as one might discuss a classroom space and a school library space. Both have different resources available to them but could be part of the interactions occurring with one specific classroom of students during the course of a day or even a given lesson. Using this term allows me the ability to recognize certain resources and restrictions that tend to be attributed with those spaces yet it does not separate these two spaces into completely different and opposite places of interaction. With the introduction of virtual space understood in this way, the spatial element of a classroom social space becomes complicated in the multiplicity of spatial components as interactions occur across these different spaces.

**Social Space as a Framework**

The framework for social space has been constructed from three primary understandings. Utilizing the theoretical work developed in my pilot study that I will explain later in this chapter, Lefebvre (1991) and de Certeau (1984), I have constructed a progression of ideas to address what social space is, how it is constructed and how practice and design intersect in that construction.
• Social space is constructed by drawing on the resources available in that space by those developing the practices of that space. Understanding the types of resources available answers the important question: “What is used to make up social space?”

• Lefebvre (1991) explains the types of spaces, perceived, conceived and lived, and how those are intertwined in the process of developing social space. Lefebvre answers the question: “How is the complexity of social space constructed?”

• de Certeau (1984) explains the very basic tenant that social space is constructed through practice and then develops this understanding to explain the way that design and practice interact. de Certeau answers the question: “How do the enacted practices of those in the space bring potential practices from what is designed into what is lived?”

**Resources of practice.** Drawing on the work of my pilot study, de Certeau, and Lefebvre, I propose that social space has resources of practice that are more available within that space. These resources are not defined solely by the design of the system/space nor by the roles of those in the space. As participants interact based on the resources of practice connected with artifacts and other participants in that space, the actual past practices within that subset of the potential become more readily available. These practices help to define the space not just in how the participants are constructing that space in the moment, but by developing a pressure of past practice, which we often equate with habits or being ‘stuck in a rut.’ These practices then become as much a part of the social space and able to be utilized in building the space as any physical aspect of that space might be. I suggest that these resources of practice are drawn from:
1) the historical interactions within that space and within spaces that are similar to that space,

2) the artifacts within that space and the historical practices associated with those artifacts and artifacts like them,

3) the participant’s individual mindsets, identities and historical practices and

4) the past practices with the other individuals who are in the space and those who might be seen as similar to those in the space.

I suggest that by looking at these resources and understanding the way that they have interacted with one another within a specific social space, we can better understand the practices and inhabitation of that space. In so doing, I identify the social space resources available to the classroom and the trajectories that make them available in that social space. Social space should not be thought of as merely a static construct formed from the mixing of these resources. Although helpful in describing the components of social space, a simple understanding of these resources begins to lose some of its power as I apply it to the changing space that occurs in the moment of interactions within a social space and how those interactions are connected to the way that the space continues to develop. The process or processes surrounding how that space develops and how the elements contribute to its construction still need to be addressed. It is within the ongoing construction of the classroom social space that I am focusing my study. As such, I will build from the understanding of what social space is to a better understanding of how social space is constructed.
**Construction of Social Space**

I understand the construction of social space in terms of Lefebvre’s (1992) discussion of three different views of spatial development: perceived space, conceived space and lived space. Perceived space is the view of space that is made up of the concrete and objective space. This is not to be understood as the “physical” space however. It is more than this. It is the meanings, habits and practices that are attached to the objects and arrangement of that space. In a classroom these are not just the desk, chalkboard and computers but also those activities that surround these. The fact that students sit in the desks and the teacher stands at the chalkboard are also part of perceived space. The process around development of this space is that of, not only the physical items in that space, but also the spatial practices which are also tied to the items in that space.

Conceived space is the mental construction of space. It includes the creative ideas and mental representations of that space. This is the conceptualized space that can provide meaning to the perceived space. These two are not mutually exclusive but rather represent the ways that we think and interact with social space and thus how we develop it. Conceived space is how we think of “classroom.” This is what we see the aspects of perceived space should be (and could be) like. In a classroom the teacher might conceive that space as one in which students should sit and receive information. The desks are receiving sites for students, the chalkboard is the content delivery system and the computer is a tool for accessing details not provided by the teacher but asked for by the teacher within specific questions or activities. Another teacher might take the same items
from the perceived space and conceive these in this way: The desks are flexible work space components, which can be assembled differently by the students depending on the activity. The chalkboard is to be used by the teacher for providing guidance on the activity and then by the students for sharing results of activities. The computer is meant as a means to access information and other individuals who might be able to help answer the question posed by the teacher and then to share that information with yet others. The development of the conceived space is done through creating a mental representation of that space which is then the basis for interaction within that space.

The lived space is the interweaving of the perceived and the conceived. It is the actual experience of the everyday life. It is the embedding of the conceived into the perceived. Thus the view of the lived space is not a mere overlay of conceived onto the perceived but is actually the creation of the lived space whereby the social space is created and experienced by those within the space as mental constructions, ideas, and representations are negotiated into and through the perceived space. The process is that of developing both the perceived space and the conceived space within spaces of representation. The classroom social space IS the lived space that is the end result of these two processes together, that of development of the perceived space and the conceived space. The lived view of space shows how the conceived view is actually lived out through the use of the perceived view.

Lefebvre’s framework of the construction of space, from the three types of conceived, perceived and lived, provides a way to understand the complexity of introducing technology into the social space. Understood through Lefebvre’s lens, the
change in technology is, on one level, necessarily defined as a change to the perceived space. This is the space of the concrete objects and their use. The introduction of the technology changes the perception of the space, which is now a space that has and uses technology. For the teacher who only makes changes in this space, the construction of the lived or experienced space is still defined by the same conceived space as in the past. Thus, the meaning provided to the perceived space has not changed and the lived or experienced space is only different in the objects and activities around those objects.

**Construction of virtual space as part of social space.** Within my study I look at the construction of the classroom social space when the teacher has conceived a different social space for the classroom. I am then interested in understanding the way that this new vision is negotiated into the lived space. As discussed in the literature review, some authors have provided various possible theoretical explanations of why the potential sought for the use of technologies may not be realized in the classrooms. Lefebvre’s work provides a tie from the theoretical understanding of the construction of the social space to work already done around new online technologies within the classroom.

Lankshear and Knoble (2006) discuss the need for a shift in mindset on behalf of those who are utilizing newer technology in order to access the actual benefits that some have found in the use of these technologies. They suggest that there is a major difference between those involved with Web 1 technologies and newer Web 2.0 technologies. For example, the typical user of Web 1 technologies consumed information or products from an authoritative expert. With Web 2.0 technologies there is a potential for distributed authorship, allowing for collaborative meaning making and production. In their work
they discovered that although some might utilize Web 2.0 technologies, they would do so in the same way that they used Web 1 technology. This situation resulted in instances such as the teacher who utilized blogging technology to post homework assignments. Although functional for the management of the classroom, this was not truly utilizing the potential of the interactive and collaborative technology. Lankshear and Knoble (2006) posit that a shift in mindset is essential in order to bring about a shift in practices that is a true change and not merely a shift in the technology use.

I propose that understanding the construction of social space through Lefebvre’s three types has explicatory power in understanding this necessary “shift in mindset.” The mindset shift described by Lankshear and Knoble is a change to the conceived space construction process and is where the teacher actually creates a different mental representation, which involves a different meaning to the space with the technology in it versus space that does not have the technology within it. As this new construction of the conceived space provides different meaning to the perceived space, the development of a lived space which embodies not only new technologies but new meanings to those technologies is constructed.

Lefebvre’s (1991) work also provides a theoretical explanation for the observed flexibility of social spaces. As mentioned, researchers have already problematized the strict bounding of space into online and offline. By discussing the differing spaces in terms of the function that they play in the creation of the social space rather than in terms of their physicality or even spatiality, there can be movement away from this online/offline dichotomy. The shift away from online/offline can be done in a way that
doesn’t do so by eliminating the truly ‘new’ of online by suggesting it is mere transplantation of activities to a new venue. Leander (2007) builds on the work of Lefebvre to suggest that the strict barrier of offline/online is created by those whose practices perpetuate a physical world view of online activities. He found that this is an arbitrary boundary that is constructed to help in grappling with the two spaces seen as distinct and separate. Leander’s work with teenagers, however, found that when examining the actual interactions of the students, the youths were crossing through these various spaces offline and online spaces. Their practices defined through ongoing interactions moved fluidly through various spaces. Understood from Lefebvre’s work, it is the conceived space of researchers and others that is creating this dichotomy. Many conceive offline as separate from online and thereby the meaning attached to the various places of interaction creates separate lived spaces. For the youth that Leander studied, however, the conceived space is one that encompasses the interactions of the youth with one another, not restricted by physical boundaries. The nature of the lived social space is that the space is constructed from the resources made available to it from the perceived world and provided meaning by the conceived world. Thus, the lived social space is inherently constructed from the negotiation of concepts such as a “discussion” and the elements of the perceived, such as the computer, the words on the screen, and the typical habits of youths of spending time talking with one another, to produce the experienced social space element of an online Facebook page where a conversation might continue which had begun while walking down the street. The overlapping resources of social
space are used to construct the perceived and conceived views that are then continually negotiated into the lived social space experience of Lefebvre.

**Social Space Construction through Practice**

It is within the negotiation of the lived social space experience where I focus my study. I provided a view into the components of social space by which I describe the trajectories impacting the space. Lefebvre describes the various and layered processes by which social space is constructed. My focus requires a final addition to my framework to provide the analytic power to explore how the lived social space is negotiated. A framework that only describes the resources and processes of social space does not alone have the ability to make sense of the multiple trajectories of those participants in the space, as it would relegate the people within the space to mere elements. That social space is indeed *social* means that the historical practices, for instance, are not a single trajectory but are multiple based on multiple people all interacting with their individual histories. It is due to the multiple trajectories that the construction of social space is practice-based. Practices are enacted in the moment through both the agency and resources of individuals’ trajectories as well as through the interactional resources made available from within the space.

I base this final aspect of my framework on de Certeau’s (1984) work discussing the practices of everyday life. His work focuses on how the practices of everyday life function within the larger system of practices found in the broader culture. Certain practices are defined as those of the mainstream or “popular.” This status legitimizes them and thereby reinforces the current system of practices and cultural productions. de
Certeau explores how the practices of everyday work within the systems of agreed-upon “popular” practices but are also working at different (not necessarily opposing) purposes. These everyday practices are not about the system, and those participating through these practices are not doing so for the sake of the system. Rather, they take up some of the practices of the popular but are also creative and take up other practices. In this way these everyday practitioners are producing different meaning. Through tying the everyday practices to specific time and location in which the practices take place, de Certeau describes the importance of recognizing that everyday practices are spatially situated. de Certeau’s work uses everyday practice as the focus of study as this moves past construction of social space to how it is developed within a specific space.

**Integration of Lefebvre and de Certeau**

These trajectories help to define the space as space can not be understood as being constructed merely by the items in the space or even the traces of past practices (Lefebvre’s “perceived”). de Certeau also suggests the space cannot be understood by how it was envisioned by those who created the place (Lefebvre’s “conceived”). As Lefebvre explained, these are processes of construction. The lived space of Lefebvre, from de Certeau’s conception of space, is created through the interactions of those who are within that space.

I use these understandings of de Certeau, and Lefebvre to explain the complex construction of social space. The everyday practice of those people manipulates the organizational structure of the conceived and actualizes the potential existent within the perceived. The creation of social space draws on the resources of the conceived and
perceived, but it is created through interactions of individuals. These interactions are more than simple habit, but are developed within the social context of groups of people interacting over time. It is the practice-based construction of social space that describes how the conceived and perceived are brought into a lived space, drawing on the social, historical, and spatial elements available.

Thus, social space is a framework that can attend to the multiple participating individuals. This is not done through backgrounding the various trajectories of the individuals to that of the spatial elements or by creating a homogenized community trajectory. Rather the classroom social space is the space of interaction defined by and bounded by the practices of that space. The classroom social space is continually constructed by those practices. Yet, this continual creation does not result in random and disconnected spaces and practices. That space is always emerging from practice does not mean that it loses any ability to be understood due to the constant change of creation. I suggest that this can be understood by understanding the process by which practices emerge, which in turn construct the space.

**Potential Practices.** Although the interplay of resources of the space and the socio-historical nature of the space in which they are being enacted does limit the easily accessible practices, it should not be assumed that these are the only practices available. Nor should it be assumed that the resources for action, participation, identity work, and interaction in a classroom social space are only those made available by school.
de Certeau (1984) discusses this when looking at the strategies of practice used in formalized spaces and the tactics of practice utilized in the everyday practices across social spaces. He describes strategies of practice as those that are used to propagate or continue the existing structures of power. One such strategy is to identify as significant, legitimate, or in de Certeau’s words “proper,” a limited number of practices. Through this strategy of practice, one person or group may attempt to limit the construction of the social space to their conceived spatial process. This strategy does not eliminate alternative practices, per se, but rather looks to make these practices less available to the trajectories that the other individuals have through the social space. I am not suggesting that these practices are the only available practices. I recognize, as did de Certeau, that the individuals and their practices are not merely actors in a closed system. de Certeau explains this with his concept of tactics of practice. These are practices enacted by the marginal majority within the environment that influences the use of that environment. Those within my focus area are enacting identities and practices to create social spaces that are bisected by trajectories, which have school as only a part of them. A student’s trajectory is not merely that of a kindergartener (or preschooler) to that of a graduate (or non-graduate). Rather, the student has a life trajectory that intersects with school and school practices (Erstad, 2011). From the social-historical practices of the students (and teachers) there are potential for other practices to be brought into the social space. I recognize that on the margins there are always practices, which form "an immense reserve constituting either the beginnings or traces of different developments. ” (de Certeau, 1984, p. 47). This immense reserve of practices is always available to those
constructing the social space. It is the immense reserve of potential practices that can provide the catalyst for changing the social space being constructed. For though the social space is continually constructed, it is frequently done so using the resources found in past practices. The reserve of potential practices is the traces of different developments, which could be enacted in the creation of the social space. These traces emerge from the elements of the social space (historical, social, and spatial), and are enacted through the use of tactics of practice that look to align the construction of the social space with the trajectories of the individual rather than the conceived space of the larger system.

If new elements are introduced into the space, such as technology, the potential of other practices becomes a more relevant pressure as there is less from which to assume or build based on the past practices. The change in practice is not because of the tool but rather an ever-occurring interplay between the possible practices introduced by the new technology and the practices that the participants actually engage with. Through enactment, these practices draw from and are rooted to the technology and space. The introduction of technology is not merely a new element in the social space but involves the introduction of potentiality into the space that must be negotiated by those in that space into practice.

The immense reserve provides a pressure of practice in its potentiality, yet this pressure must be enough to overcome the pressure of the historical, social, and spatial practice trajectories in constructing the space. As discussed, the pressure of past practice can be mitigated through the introduction of new elements into that space. This should not be thought of as the only way that these potential practices might be accessed and
enacted. de Certeau recognized there is an interplay of the person and their own agency within the development of the social space which may also draw on that immense reserve of potential practices. He suggested that although space may frame practices, there is an ability to reconstruct the experienced space through practice. He looked at the intentionality that can be a part of the conceived space. That is, the mental constructions of a space are not simply responsive to the perceived space but individuals can creatively develop mental representations of the space. These mental representations may then impact the way that the perceived space is constructed or arranged. In this way there is a purposeful design of the space that is emerging from the potential practices envisioned (conceived) by those who are designing the constraining elements of the space. These constraining design elements are both the spatial elements (i.e. what objects, arrangements of space, and resources are available) and the social elements (i.e. the positioning that is done to make certain practices, roles, and identities available).

**Affordances as potential practices.** As discussed in the literature review, there are a number of researchers who have discussed the idea of affordances of technology in its use in education. The affordances of a technology can then be drawn from 1) the actual functionality of the technology and also 2) the practices that have been observed occurring with that technology. Drawing on this analysis of the literature, I suggest that the mere introduction of the technology into the space does provide some beginnings of practice development. It could allow for teacher and student to take up those technologies in new a creative ways, as they have become a part of the spatial elements constructing that space.
Web and Cox (2004) build on earlier work of Gibson (1979) to define affordance as “what the learning environment offers the learner.” They go on to explain that the “affordances depend on both the learning environment and the action capabilities of the learner” (p. 238). The affordances of the technology that are introduced into the classroom are situated within the social space of that classroom and the practices available to the learner. Squire and Mingfong (2007) found that the students engaged more fully in scientific argumentation by participating in the specific activities within the game and drawing on the affordances offered by both the role-based play and the blending of the game and classroom spaces.

This can be seen in our research (Luehmann & Frink, 2009); we found that one particular teacher made certain practices of the students, that of posting on the blog, a mandatory activity within the social space of the classroom. This decision not only made the practice available, but it utilized the current practices of the classroom social space (that of the teacher as designer and the students as enactors of that design) to provide additional pressure to those practices. We found that although the students might have performed the practice, it did not result in the construction of the expected (or hoped-for) social space. The practices, which emerged, reflected the compliance behavior, which was a past practice of the classroom social space, rather than the more creative practice the teacher had hoped. Thus the affordances or tracings of a given technology when it is introduced into the classroom can be defined by the potential spatial and social practices around that technology as viewed from a lens of past/historical practices and taken up by the trajectories of practice.


**Trajectories of practice.** Within his work, de Certeau discusses the way that those who interact within a space are moving through a place. I suggest that practice as seen in this context can be best understood as a trajectory. I have defined practices as socially evolved and meaningful ways of doing things or getting things done. Trajectory is a useful visualization of practice as it helps to elucidate the primary aspects of practice as outlined below.

- Those moving on a trajectory are not static but rather in motion just as practices are not ideas or plans but are the actual *ways of doing things or getting things done*. Trajectories are practices in motion.

- A trajectory is a series of points, connected together. Thus, it represents practice not as a solitary act or even as a framework, but rather as connected and changing, that is *evolving*. The trajectory of practice is connected to the past (where it is coming from), also includes a place (where it is currently moving through) and to people (who are moving), with an implied future, which makes it more appropriate than understanding the practice as a framework that has meaning derived from its solitary form.

- Practice is *socially* evolved. That is the practice is not developed in isolation to others. This aspect of practice understood as trajectory is of prime interest for me. The trajectories of practice in the classroom changed. What caused them to change?

- Practices are also *meaningful*. This meaningfulness is represented in the direction of the trajectory. The meaning in a trajectory is derived from its movement. The
movement has directionality. I do not suggest that this directionality is singular, static, nor that it is always even known, but practice is movement, it is the meaningful way of getting things done. It is this meaning that provides direction to the practice.

The concept of trajectory in understanding practice is a problematic one for de Certeau. On the one hand, he recognizes the value of this concept as it conveys movement over time. The idea of a trajectory, as a path, does adequately address the way that individual’s behavior is not set but rather follows a path through the options within the structure that has been produced. However, he suggests that the concept breaks down when it is understood as a shape that can be viewed to completion, that there can be a reversal of the path that is taken. As such, I do not reduce the trajectories that I described to statistical graphs, but rather I have followed the stories of the individuals. Thus, I seek to avoid these misrepresentations of the concept of trajectory while using it as a guiding concept within my discussion. The take up of the social space, the design, the reaction of the take-up of the design and subsequent redesign overlaid with one another tells an interesting story across my three findings presented in Chapter Five when looking at movement of practice and directionality.

Application of my Framework to the Classroom

Through the framework I have developed, the work done by a teacher by introducing a new technology can be seen as a change in the perceived space (i.e. the resources of the space) combined with a potentially creative change in the conceived space (i.e. how the social space should/could function and the meanings associated with
it). These changes are meant to make specific practices or affordances more available to the students.

I suggest that the pressure of the historical social practices can constrain the individuals to take up the teacher’s ‘required’ practices. These past practices have been accepted as part of the space and therefore the social context in which all participants have voluntarily chosen to interact. In saying ‘voluntarily’ I am not suggesting that the choice was a preferred, ideal or even willing choice in some instances. Nor do I suggest that this choice is absolute. I do recognize that the students and teachers are both within the classroom social space for a variety of reasons that do not likely correspond with a direct desire to be there. However, there is a broader reason that has caused each of them to elect to accept the understood practices of the space, such as the requirement to remain within the given classroom for the specified time of the class. Another accepted practice is that the teacher has design power of both the physical spaces and interactional spaces of the classroom. She chooses the layout of the space and the activities, which will take up the time while in that space. The complications of both past historical practices and indexed social identities within a given space create a differential of available practices.

Gutierrez, Rymes and Larson (1995) found that students do not accept the practices of the interactional space and time to the same extent as they accept those of the physical space. The teacher in this study had a different set of practices then her students. These practices sometimes overlapped and at other times ran in parallel. The enactment of parallel practices developed two separate interactional spaces within the same physical space. This study demonstrates the complication of social space creation. As the social
space is made up of the historical, social and spatial practices, even though individuals may participate in similar spatial practices, the differences in the social practices may cause a change in the social space or the development of two parallel social spaces.

I do not wish to create a false dichotomy of the teacher versus the students with my examples. As discussed in the literature review, in a school setting with the requirements of that location, the learning that is most often prioritized is that which has been legitimimized by the school, its curriculum and the focus of the teacher in her design. It is in this understanding that we begin to see the divergence of the design work for the use of the emerging technologies. For example, the teacher may have a goal for a certain type of learning, namely that of cross-cultural social interaction. However, if the curriculum has legitimimized and codified (through the use of assessments) the learning of historical facts, then the cross-cultural understanding must either be overlapped with, replaced by (perhaps temporarily), or merged into the curriculum that has been already embedded in the space. The rules of learning within that classroom space are dictated to no small extent by the requirements of the curriculum and the assessments used to ensure compliance with these dictates. Within a classroom, this negotiation between the practices of the school that have been deemed ‘required’ and the lived practice of the classroom is done through a pedagogical process that is yet still impacted and constrained by ongoing interactions. Thus, the design of the space is not just that of the teacher but comes from a variety of practice trajectories.

As can be seen in these examples from the literature, the conceived space of the teacher (or school) does not necessarily become the lived space of the classroom. de
Certeau (1984) described this in his study of city life. The planners of the city may design the space for a specific use or flow of people. However, the actual lived use of that space was different depending on the take up of the design by those walking on the street. In our work (Luehmann & Frink, 2009) in classrooms, we also found that the design work of the teacher did not, in fact, define the way that the technology would be utilized. We found that there were differences which impacted the actual practices around the technology’s use which came from 1) the teacher’s goals, 2) the teacher’s roll-out or described design and 3) the way that the students “took up” the teacher’s design.

This study looks at how social space is constructed when the teacher introduces online technologies into the classroom. Introducing technology into the classroom space is not merely a change in the physical resources of the spatial component of the space. It often involves purposeful design on the part of the teacher and the social and historical practices of all participants that surround that technology. It is a change to not only the perceived space process but also the conceived spatial process. Thus, the introduction of technology as a design element is often a complex positioning effort by the teacher to shift the practices constructing the lived social space. In my study, this positioning looks to involve the students not solely as reactants to her design but true participants in the co-construction of the social space through lived practices.

The social-historical and historical-spatial practice trajectories of the classroom provide pressures of practice that shape the perceived space and can shape the conceived and therefore lived space. However, the decision of the people in that space, those who actually enact the practices that construct the space, can still subvert or subsume the
spatial or social-historical restrictions. For example, the blackboards (or whiteboards or interactive whiteboards) in a room create a front to a room as well as create a specific area of presentation. Yet many teachers have found ways to move past this. Some have used chart paper, small groupings, or the blackboard solely as an end presentation space and thereby use practice to define the spatial construction. Others have used a technology solution through the use of slate technology which takes the “front” of the classroom in terms of spatial design and removes this as the control point through freeing where a person can be who is writing or controlling that front space. Physical, social, and historical constraints and practices are still only the resources for the enacted and lived practices, which create the classroom social space.

If the teacher no longer perceives the restrictions or lack thereof to take on a specific role in regards to instruction, she then has greater potential roles and positions that she can take on as it relates to her classroom. As the teacher takes on different roles, the students have the space to also change and take on different roles and practices that may have traditionally been taken on by the teacher. Also by expanding the time and space there is the potential for more than one individual to take on the same role. In this example, the spanning of spaces through the design of the teacher, disrupts the typical practices enacted in the physical classroom space as the teacher is no longer the sole conduit to accessing content or material, the only accessible individual with greater expertise, nor the only way to access the tools for constructing information (Fabos, 2008).
Summary

It is the way that these potential practices, which are the possible beginnings of different developments for social space, that makes classroom social space so interesting to study. Understanding these potential practices and the way that these move into the lived practices of the classroom space is essential in looking at the use of technologies in the K-12 setting. I am looking at a nexus of multiple trajectories rather than merely examining the way in which the tool mediates and/or transforms the main meaning making process. Wrapped into this nexus centered on the use of technology are not only the spatial elements but also the individual and group historical trajectories of practice. The great repertoire of potential practices does have impact on the development of the space and the practices within that space. These practices and resources are sitting on the edge, almost a part of the space, adding pressure, providing the shape of the space, yet not an ongoing part of that space. This study is designed to better understand how the teacher might design activities around the use of online technology in such as way to make specific elements more or less impactful to the construction of the lived classroom social space.
Chapter 4: Research Design

The design of a study and the methods used are necessarily shaped significantly by the underlying theories, which ground the study. Due to this, I start my design section with a return to my own theoretical stance and describe my research design within this frame. As my own ontological stance is that humans are social beings who construct themselves through interaction with others within specific contexts and that knowledge is not only socially constructed but that the very value of knowledge and its use are defined socially within the context of that use, a qualitative approach to this study is warranted.

That said, my own ontology and epistemology as a researcher should not be the sole determinants of the specific methods utilized, nor should they define the design structure of my study. The design should also be crafted in light of the demands of the research question. I will begin my research design with a discussion of my overall design structure; the methodological approach, research design and analysis. I will then describe the project from which I draw my data. In my next section, I describe the specific data set and the methods used to gather that data. Within the analysis section, I define the analytic approach I took as well as the potential concerns with my approach. I will conclude with a brief discussion on the validity of my study.

Overall Design of Study

The context of my question is the co-construction of classroom social space. Social space, according to my theoretical stance, is continually constructed through the ongoing interactions occurring within the, typically physical space that draw on historical practices. Classroom social space is situated within larger contexts and histories of
practices including those of the school, the school district, and the community. It is created through the practices, which are negotiated and enacted by the participants within the social space.

As discussed previously, digital technologies are making more practices available that can impact the construction of social spaces (Lankshear, 2003). The interactions, knowledge flow, and even when “teaching” is taking place can be changed through practices that utilize the technology for these activities. Classroom practices could look quite different than they have in the past if particular digital technologies are introduced. This complication of an already complex environment, that of schooling, requires a research design that supports the analysis of human interaction from multiple vantage points while also providing for the flexibility to explore unexpected aspects which may arise through the research process. The mere complexity of the environment or phenomena being studied does not predicate a specific methodological approach to research. However, the complexity of the phenomena, specifically the extent to which what is being studied can be analyzed through specific and critical variables of that environment does indeed suggest specific approaches. There are two primary strands within educational research; that of quantitative and qualitative (Denzin & Lincoln, 2011; Erickson, 2011), although rising in use is that of mixed methods with its own purpose and theoretical grounding (Creswell, 2011). These two methodologies are grounded in different purposes and theoretical foundations. In designing research, it is important to understand both the reasons for selecting a specific design as well as the reason for not selecting others (Marshall & Rossman, 2006).
Rationale for a qualitative approach. Within this section, I will first use previous research studies to explain why I am not using a quantitative approach and then will explain why a qualitative approach is an appropriate match for my research. Quantitative research as a methodology is an approach that looks to verify a hypothesis or expand on an existing theory (Field & Hole, 2003). This approach melds well with specific understandings of the use of online technologies and certain types of research questions. In my review of Internet-based research in education, I have found that when online interactions are understood as a competency rather than as meaning-making practices as I have defined it, then studies focus on standards for competency and how these are accessed. These studies are often large-scale and quantitative using surveys as a primary source of information. They often represent the work of various organizations to understand the way that Internet technologies are used, accessed, and potentially impact the lives of individuals (Kozma, 2003). Some of these studies also focus on the use of technology in education and understanding it from the lens of specific organizational standards or in exploring the extent of use (Anderson, 2008; Hobbs & Frost, 2003). Each study utilized different tools, but overall these studies employed surveys to large groups to be able to discuss trends of activity that were occurring. Although helpful in providing a background to the type of work I am discussing, the design of large-scale surveys does not allow access to the details of the complex interactions involved with the design, implementation, and take-up of the specific affordances of online practices within a classroom social space. Rather than a quantitative approach involving large-scale surveys as others have done, I have selected a qualitative approach as it better allows for
understanding the nuances of interactions and practice in a complex and ever changing environment.

Qualitative research of any type is meant to explore and understand patterns of interactions, the ways that people are people, and how they develop the practices that define the way they live (Heath & Street, 2008; Marshall & Rossman, 2006). Thus, the rich description and inductive analyses found in qualitative research align well with my exploration of the complex environment of classroom social space. Qualitative research is appropriate for examining the negotiation of practice within social space, because its narrative, detailed, and organic priorities allow for more diverse and nuanced access into the social element that involves many people with multiple points of view where the meaning of actions and responses are being constructed in the moment (Duranti & Goodwin, 1992). As I looked at both the design of classroom activities as well as the practices that emerged around and in response to these designs, I needed the ability to allow the shaping of the study to be informed by ongoing data analyses. This type of flexibility in a study has been identified as a benefit of qualitative studies (Stake, 1995). As such, I saw that qualitative research provided appropriate processes for meaning making of the unknown interactions that I would be studying in both classroom and online spaces.

A qualitative approach is also appropriate for the specific topic and theoretical framework I used. Marshall and Rossman (2006) identify specific types of research topics that are situated to best make use of the value of qualitative research. Below, I highlight those types that specifically relate to my study. First, as already identified
above, a qualitative approach is appropriate for research in which the details of the context shift in ways significant to the research question. My study examines the way that larger context of the classroom social space was changed through the study. Second, qualitative research is a good match for little known or innovative systems, such as the use of Virtual Worlds in the K-12 classroom setting seen in my study. Third, research for which relevant variables have yet to be identified are appropriate matches for qualitative research. Although, I entered this study with some variables identified from my pilot study, the relevant variables for my research was defined during my analysis.

As seen in my literature review, not only is there a gap around this type of research, but the field has had extremely mixed findings as it relates to the use of these types of technologies in the classroom. Qualitative research has been identified as appropriate methodology for research that elicits multiple constructed realities but is studied holistically. This understanding matches well to my theoretical framework as all three of the primary theoretical frameworks from which I draw, Soja, Lefebvre and de Certeau recognize that there are multiple and overlapping meaning making processes which should be seen as a whole when understanding social space.

**Ethnographic approach.** Understanding the negotiations of classroom social space in response to instructional design requires me to not only understand what is happening, but what is happening from the lens (goals and purposes) of the teacher (Luehmann & Frink, 2012). I am committed to understanding the complex, layered and ever-changing interactions that are occurring within and across new online spaces and the classroom. Thus, I must intentionally seek ways to explore the unique aspects of studying
interactions that occur in environments that are distributed both across space and time (Leander, 2004). The very nature of the participation in these situations changes the way that participants are able to interact and as such how we research. As this area of study is still developing, many of the questions currently being posed around online, interactive technology in classrooms relate to understanding the environment and the interactions occurring in that environment.

As I seek to understand ‘what is going on in this context’ (Heath & Street, 2008), my research suggests methodologies and approaches that are more ethnographic in nature. Ethnographic methods are those that center the participant’s voice, that focus on the everyday practices of those participants, and where the researcher is embedded. Schroeder and Bailenson (2008) in their discussion of methods and research designs used with Multi-User Virtual Environments, suggested that when the research aim of a study is meant to understand more complex and socially intensive interactions, (e.g to understand the way that interactions ‘in-world’ impacts the real-world), studies typically utilize ethnographic methods such as participant observations with interviews. The research reviews of both Hew and Cheung (2013) and Mills (2010b) identified the large number of ethnographic approaches used in understanding technology in education. Both identified the complex nature of a classroom as well as the emergent aspect of the technology as reasons that ethnographic approaches were used so frequently. Marshall and Cox (2008) conducted a review of the research and the methods used with educational technology. They described the typical methods utilized for the most common research goals. They found that when the research goal was that of the effects of technology on learning
strategies and processes or the effects of technology use on the pedagogies and practices of teachers, the most common methods used were more ethnographic including class observations, teacher interviews, questionnaires, and documentation in an effort to follow the participants and their processes over time. Marshall and Cox suggested that the very complex nature of technology integration makes it more difficult to conduct research then more confined educational innovations and thus lends itself to methods that are qualitative and more constructivist in approach. Brown (2013), in his discussion of ethnographic approaches in digital research, explains that ethnography is about shifting the focus to the user and a “close attention to questions of practice and members’ perspectives” (p. 195). He goes on to discuss online ethnography and suggest that the richness of multiple modes of interacting in a virtual environment such as Second Life allows for the application of ethnographic approaches. Brown additionally proposes that the design in these spaces must have flexible methods as the environment and practices are often changing quickly.

These authors all identify an ethnographic approach to online technology use as more emergent, allowing for multiple foci within the research. Drawing on the methods and approaches employed by these other researchers, I also elected an ethnographic approach as it aligned with my research to examine the emerging and changing practices within the classroom social space. Although a full ethnographic study would be appropriate to understand the meaning making taking place in everyday activities, my time and resources for this study did not allow me to completely embed myself in the social environment. However, I took an ethnographic approach to the work in my study
as I tried to understand the practices and patterns of relations within and across the various interactional spaces comprising classroom social space.

**Virtual Ethnographic Approach.** An ethnographic approach provides the stance from which to ask the question "What is going on in this location related to the people and their interactions?" However, since the location is 'fractured' across multiple locations, the typical methods involved with ethnographic studies must reflect these changes in the nature of the space in which the interactions are taking place (Leander & McKim, 2003). Hine (2000) addressed the multi-site and multi-use nature of the Internet and suggested that an ethnographic approach allowed for research around something as diverse and rapidly changing as the Internet. She suggested that the Internet should be understood as both a site of cultural production and a cultural artifact, in that it is related to in multiple ways as it is lived through and a part of everyday life. This complexity required, what she termed, a “virtual ethnography”.

Leander (2008) built on Hine’s work to develop a rationale for a “connective ethnography” to address not only issues of complexity of interaction but also the spatial and temporal dimensions which become more impactful when dealing with online technologies. He suggested that his proposal was not a single methodology but “a stance or orientation to Internet-related research that considers connections and relations as normative social practices and Internet social spaces as complexly connected to other social spaces” (p. 37). I also adopt this stance or approach as part of my own methodological design. The benefits of this approach to the research questions I am asking include 1) the need to shift the focus of study from analysis of products produced
(e.g. chat transcripts, online sites, avatar characters) to analysis of practices of production, 2) the consideration of interactions occurring online as connected to other/multiple participants, practices, and spaces both online and offline, and 3) the recognition that the way to understand the flow of participation across spaces and practices is through close observation and/or participation in these practices and spaces.

**Summary of the overall design.** My study design is complex, just as the focus of the study is complex. It is a qualitative, ethnographic, study analyzed through a theory-driven approach. I would suggest that I strive within my design to address the complexity without making it complicated. Thus, I have elected a qualitative methodological design as it aligns with my ontological view that humans are social beings and that meaning is constructed socially. I have an ethnographic approach because my question requires me to understand the everyday interactions over time within the negotiation process. I will use a systematic, multi-step process for analysis that is aligned to my research question and theoretical framework.

**Data Set**

In this study, I utilized previously collected data. These data are the result of a three-year, RSRB-approved study. The data collection was conducted initially as part of the Advanced Qualitative Research Methods class of my doctoral program. I continued the work through an independent pilot study in recognition of the importance for this type of work and with the hope to build into a full study.

**Description of the overall research project.** The three-year research project followed one teacher as she looked to utilize virtual world technology at her school and
with her students. I conducted a pilot study analysis focused on the first year of data. I utilized the information collected from one class period in the second year as the data sources for this study. I used the preliminary findings from the pilot study to focus my analysis of this data set, although I left open the potential for emergence of new themes. I began the study in year one, working with a teacher interested in conducting an after-school program for students as they worked in a 3D virtual world called Second Life. The principal and district administration of the school found in a medium-size city school district supported both my role with the teacher and the teacher’s further use of the Second Life project as a means of providing authentic language experiences. The study continued in year two as the teacher chose to bring Second Life into her classroom after reflection on the work from the first year. The teacher continued her work in a third year. Based on her reflection and experiences with the use over the previous two years she elected to focus her time and work with select classes only. Although the work did continue into a third year, I collected very little data, primarily because Linden Research, Inc. discontinued the use of Second Life for those under the age of 18. As such, the teacher elected to end her use of 3D virtual environments for that year and began planning for the use of online, interactive technologies of different sorts for the following year. Her school was restructured at the end of the third year, however, and as such her position was changed.

**General timeframe of initial research project.** My data collection and initial analysis were intertwined and ongoing. However, due to 1) the teacher’s own concept of each year being different types of work, 2) the significant change in the structure of the
class, and 3) the change in participants as different students were involved each year, it is appropriate to recognize the way that the data has organized itself by school year (with some overlap of teacher interviews and planning through the summer months between years). Table 4.1 outlines the students involved, the structure of the use of the technology, the data collected, and the research question that guided the data collection each year.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td># Students</td>
<td>14</td>
<td>42</td>
<td>13</td>
</tr>
<tr>
<td>Structure</td>
<td>After-school, voluntary club earning .5 credit</td>
<td>Two week unit across 6 classes, application unit for 3 intermediate classes 3 months later</td>
<td>One-week introduction unit with 2 intermediate classes with a plan to use throughout the year</td>
</tr>
<tr>
<td>Research Question</td>
<td>“What is happening here as the teacher introduces this technology?”</td>
<td>How are the multiple purposes for an online space negotiated and enacted in a school context?</td>
<td>How does the design process impact the teacher's purposes for the use of emerging technology in the classroom social space?</td>
</tr>
<tr>
<td>Data Types Collected</td>
<td>Recorded planning sessions</td>
<td>Recorded planning sessions</td>
<td>Recorded planning sessions</td>
</tr>
<tr>
<td></td>
<td>Recorded, open-ended interviews of teacher (multiple, embedded)</td>
<td>Recorded, open-ended interviews of teacher (multiple, embedded)</td>
<td>Recorded, open-ended interviews of teacher (multiple, embedded)</td>
</tr>
<tr>
<td></td>
<td>Recorded, semi-structured interviews (one per session)</td>
<td>Recorded, semi-structured interviews (two per student)</td>
<td>Recorded, semi-structured interviews (two per student)</td>
</tr>
<tr>
<td></td>
<td>Participant observation captured through field notes</td>
<td>Participant observation captured through field notes</td>
<td>Participant observation captured through field notes</td>
</tr>
<tr>
<td></td>
<td>Participant (student and teacher) reflection</td>
<td>Participant (student and teacher) reflection</td>
<td>Participant (student and teacher) reflection</td>
</tr>
<tr>
<td></td>
<td>Still pictures of classroom and school environment</td>
<td>Still pictures of classroom and school environment</td>
<td>Still pictures of classroom and school environment</td>
</tr>
<tr>
<td></td>
<td>Artifacts: teacher planning documents, student work</td>
<td>Artifacts: teacher planning documents, student work</td>
<td>Artifacts: teacher planning documents and student work</td>
</tr>
<tr>
<td></td>
<td>Documents: website pages, policy documents, proposal for course</td>
<td>Documents: website pages, policy documents, proposal for course</td>
<td>Documents: website pages, policy documents, proposal for course</td>
</tr>
<tr>
<td></td>
<td>• Video recording of every class session</td>
<td>• Video recording of every class session</td>
<td>• Video recording of every class session</td>
</tr>
<tr>
<td></td>
<td>• Recorded screen capture in world from one student perspective per session</td>
<td>• Recorded screen capture in world from one student perspective per session</td>
<td>• Recorded screen capture in world from one student perspective per session</td>
</tr>
<tr>
<td></td>
<td>• Focus Group sessions (two per group total)</td>
<td>• Focus Group sessions (two per group total)</td>
<td>• Focus Group sessions (two per group total)</td>
</tr>
</tbody>
</table>

Table 4.1- Overview of data collection for full project
The pilot study year provided insight and information for my study. Some of the design decisions made by the teacher as well as research design decisions that I made were based on the experiences from the pilot year. For this study, I focused on the second year of the three-year study and specifically the 6th period, intermediate language class. The time frame for data collection for this study included summer planning sessions with the teacher, three initial visits to the classroom in the month of September for a full day each time, two class visits in early October, a two-week introductory unit in mid-October, a two-day application mini-unit for select classes at the beginning of February, two follow-up interviews and one follow-up classroom visit. In year three, the teacher chose to only involve two of her intermediate courses. The reflection of the teacher in her initial planning and decision to stop using the system will be included in my study as this represents her experience and thoughts across both years that the project was able to run to completion.

**Design for Data Collection**

Although I collected a breadth of information during my actual time in the classroom setting, my study has a specific research question to answer. As such, I will outline the initial site and participant selection, but then will also identify the data that I have selected from the broader project included in my study. I will first describe the selection processes of this study and how it aligns with my question. I will then describe the site itself in detail to provide the context of my study as well as describe my role within this context. Following the description I will outline the data collections methods and the analysis I conducted.
**Initial participant and site selection.** Drawing upon my theoretical framework with the focus of my research questions, I identified specific criteria for my case. Selection is a critical part of the study design. By setting clear criteria for my selection, I sought to develop a more trustworthy design (Reybold, Lammert & Stribling, 2013). First, as my framework regarding social space is that it is constructed from everyday practices, I situated my methodology in an ethnographic approach. This required that I have access to the everyday practices and the patterns of interaction. Second, in order to examine the ongoing, construction of social space, I needed a study that would extend over a significant amount of instructional time. A single lesson or short-term interaction within the online space would not provide the opportunity for ongoing negotiation.

The third aspect of the selection had to do with the choice of utilizing a virtual world environment or 3D environment versus other online spaces that might be more readily available such as blogs, wikis, fan sites, etc. With a strong focus on social space, a 3-D environment provides a space that is, to some extent, bounded within the virtual world. The type of virtual world project that had been selected provided boundaries of interaction, but at the same time increased the ongoing interactions that would take place allowing for patterns of practice to emerge. In this environment, the complexity of the interaction and the potential practices available to the teacher and the students was greater.

My fourth and final criterion was in regards to the teacher herself. As, I worked within the theoretical framework of New Media Literacies, I recognized the need for a mindset shift in the teacher herself when implementing the use of interactive technologies
into the classroom. As such, I was interested only in those teachers whose stated pedagogical commitments already met the need for the mindset shift described by Lankshear and Knoble and whose fellow teachers, administrators or students also had seen some practices that demonstrated these shifts. In this way, I was ensuring that the teacher would be open to the potential practices that online technologies could afford them.

I was initially invited to support the project at this site by the teacher who was told of my interest in and familiarity with virtual worlds. Although the teacher was the one who initially connected with the project called Skoolaborate, with which her class participated, she asked that I become the primary point of contact as I had familiarity with organizational relationships and could best help her navigate the development of the project relationship. After polling 20 districts within the geographic region, I learned of only three other teachers using this technology. I found that only this teacher met the criteria of my study as outlined above and so her site was selected for my research.

**My role.** Prior to describing the study itself, it is important to understand my role in this project and my entry into the site. Marshall and Rossman (2006) discuss the importance of having a plan for entering the site as the entry sets the role of the researcher and establishes the preliminary relationship that the researcher will have with participants. As much of the data collection and interactions in a qualitative study involves trust and relationship, this plan is extremely relevant to the data collection and eventual success or failure of the study.
I was a participant-observer in this data collection as I took the role of an integration specialist for the teacher’s project. My responsibilities in that role were to support her work and provide guidance and resources as she integrated this technology into her instruction. These two roles, that of participant observer and integration support, were complementary as both roles required the teacher to take the lead in the projects and yet required me to collect data about the project for later reflection. In the case of the integration specialist, the data were collected solely for the teacher’s reflection, but as a participant-observer, the data were collected for the additional use in research.

I was involved with the steps of the planning process as someone who could provide reflection and potential ideas. Within the site itself, I was present for all of the class sessions when they were in the virtual world. I provided support in the form of explaining aspects of the use of the virtual world when the students, teacher or in-world orientation videos were not able to help. In this way I was a participant at the site, as I would struggle with them to find answers. I would often only have the basic information of where to find the information that they were searching for and thus we would develop solutions jointly. Acknowledging my existing relationship with the participants of the site did not reduce the potential issues involved with my being white interacting with exclusively Hispanic students (Marshall & Rossman, 2006). Additionally, the students were all bi-lingual with English not being their first language. Thus, many of the interactions that occurred in the classroom involved at least some Spanish. Having studied and even taught basic Spanish for some years, I did not see that this was a hugely limiting factor, although it did provide some barrier to accessing the complete nuances of
communication that were occurring. Additionally, the students in the classroom were from six different countries. I had significant interactions with other individuals from two of those cultures and thus had some experiences with the nuances of communication and interaction with those students from these countries. My lack of experience and understanding with the multiple cultural histories in the classroom could also have led to misinterpretation of actions and interactions. I strove to recognize this within my field notes and attempted to reduce this gap through member checking with students during interviews and interactions during the day in the classroom setting. Although these aspects do provide additional complexity to the case, they were not impediments for my research or the methods of collecting data that I employed.

**Study participants.** The full research project included 43 participants, 42 students and one adult. There were 20 male students and 22 female students. Although all of the students were Hispanic, they were from six different countries. The students were in five different 40-minute class sections, which met daily for the course of the year. The students were grouped by language skill ability; either beginning or intermediate. The course itself was a computer survey course. The distribution of students across the courses can be found in Table 4.2. For the purpose of this study, I focused on the classroom interactions and social space that were constructed as part of the period 6 class. I selected this period as a) the class had a larger student population providing multiple viewpoints, b) the students were intermediate language students providing greater interaction between teacher and students, and c) there was a good portion of the students
who had experience with online games or virtual worlds providing a deeper historical practices background in this area.

<table>
<thead>
<tr>
<th>Period</th>
<th>Total Students</th>
<th>Male</th>
<th>Female</th>
<th>ESOL Level</th>
<th># who had experience with Virtual Worlds, Online Gaming or MUVEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>Intermediate</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>Beginning</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>Beginning</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>6</td>
<td>8</td>
<td>Intermediate</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>13</td>
<td>3</td>
<td>10</td>
<td>Intermediate</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 4.2 Student population in year two of the study

**Description of the site.** Although I provide a description of the site and project below, two items should be recognized when reading this description: 1) the context cannot be separated from the purposes, practices, and spaces discussed (Goodwin & Duranti, 1991) and 2) by analyzing and describing, I am in fact interpreting data and not merely reporting it (Marshall & Rossman, 2006).

The grade levels found in this building ranged from 7-12, however the school had the additional focus of containing one of the few, fully bi-lingual programs in the entire city. The program was set up within the department known as English for speakers of other languages or ESOL. The teacher, who spoke Russian, taught computers within the ESOL program to the completely Spanish-speaking student population. The student to teacher ratio for the school was 13 to 1.

**The virtual space.** Across all three years, my research project included not only the typical interactions of conversation, discussion, and assignments but also included interactions through a computer-supported, virtual environment called Second Life.
Second Life is a 3D computer program that connects users through the Internet with others around the world. Within this program users create a representation of themselves or an avatar, which they can then manipulate through the 3D landscape. The user is able to adjust the look or appearance of the avatar from 12 basic looks with a great level of detail (eg. the shape and color of the eyes, the height and weight of the body, longer arms, shade of skin color, etc). The user can also change the clothes of the avatar using basic sets of ‘clothes’ from their pre-stocked inventory or purchasing additional clothes. The user is also able to create or modify her own clothing and save these as additional inventory items to be used or exchanged later.

There is a set of navigation features that allow the individual to move the avatar through the program, viewing the environment from the 1st person perspective. The tools allow the user to make the avatar walk, run, fly, teleport (instantly move from one portion of the 3D landscape to another), and perform a wide variety of pre-programmed and customizable gestures (eg. laughing, dancing, waving, etc). Users interact with one another through their avatars by the use of these gestures or through the communication tools, which include both, textual and audio chat features and an instant messaging option. The chat feature allows those within the same area of the program to all hear or see the messages. The instant message allows one user to send a text message to only one other person or a group of people and so allowing a more private discussion that cannot be ‘overheard.’ In order to instant message (IM) other players, a user must ask to be a ‘friend’ of the other player and the other player must accept the offer of friendship. Once two avatars are friends, they can communicate from any location in the program and also
offer the other player a ‘teleport,’ or the ability to be moved instantly to the same location. The program also has a set of tools, which allows for the creation of additional 3D objects within the space that can be changed and modified through the Avatar. All objects are made of basic shapes, called prims, and can be reshaped, modified or grouped together to create everything that is viewed in the program. This program was installed on the computers in the English as a Second Language (ESOL) computer lab and the laptop cart in the teacher’s room. Both sets of computers were purchased through a grant, which the teacher had written and received.

*Description of the international project.* To provide structure and interaction, the teacher elected to have the students participate in a project called Skoolaborate. According to the website and the materials provided directly to the teacher, Skoolaborate was an international, education project involving 30 schools from 11 different countries, working within the virtual world called Second Life. Only teachers and students from schools involved with Skoolaborate were able to interact together in the restricted area of the 3D virtual environment. As part of Skoolaborate, schools were expected to develop lessons that made use of the construction or interactive functionalities in Second Life. Schools could participate in projects run by other schools or develop their own.

*Data Collection Process.* As I started within a grounded theory approach initially, I entered the data collection process at the site with only a basic framework for the data collection. My ethnographic stance meant that I had positioned the data collection to purposely capture the everyday activities and individual voices of the participants, including myself. Critical to any research design is that the data can
appropriately answer the questions being asked of it. This meant that I needed to have a breadth of data sources related to the interactions within the classroom in order to provide access into the range of negotiation of potential practices and lived practices. I also needed to understand the ongoing design by the teacher (and students), the purposes that were in place in that classroom, and the way the students and teacher took up and reinvented this design.

The need to draw the data from multiple sources is due to the multiple elements and multiple points of view inherent in qualitative design (Denzin & Lincoln, 2011; Marshall & Rossman, 2006). In order to be assured of being able to appropriately and fully address the issue and develop "thick descriptions" (Geertz, 1973), I utilized six different data collection instruments; participant observation, video recordings of sessions, computer-screen recordings, focus group interviews, open-ended interviewing, and participant reflection. As qualitative methodology is interpretive in its approach, each of the different collection methods was specifically designed to inform other methods in an iterative process. I conducted the data collection with this purposeful spiraled approach as I worked within the setting. For example, the review of my field notes and teacher planning sessions informed the approach I took within the student interviews. Although I did not transcribe or code the recorded video and audio during this initial collection, I did rough coding on random samplings to ensure that any unexpected categories of data were being recognized and included in the ongoing data collection.

**Data sources.** The information sources I collected spanned nearly a full year of actual time. However, the intensive collection time was during the two-week introductory
unit in October and the second unit the teacher conducted in February when the class returned to Skoolaborate. Table 4.3 highlights the timeline of collection to situate the different types of information collected into the temporal context. After highlighting the span of data collected, I will discuss each type of data and its rationale for inclusion in my study.

<table>
<thead>
<tr>
<th>Timeline of Collection</th>
<th>Information Collected</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer prior</td>
<td>School, district, project documentation</td>
<td>Teacher, Skoolaborate</td>
</tr>
<tr>
<td></td>
<td>Recorded audio of teacher planning (2)</td>
<td>Teacher</td>
</tr>
<tr>
<td></td>
<td>Email correspondence (16)</td>
<td>Teacher</td>
</tr>
<tr>
<td>September</td>
<td>Classroom observation (field notes)</td>
<td>Teacher and class</td>
</tr>
<tr>
<td></td>
<td>Email correspondence (22)</td>
<td>Teacher</td>
</tr>
<tr>
<td></td>
<td>Recorded audio teacher planning (2)</td>
<td>Teacher</td>
</tr>
<tr>
<td></td>
<td>Classroom observation (field notes)</td>
<td>Teacher and class</td>
</tr>
<tr>
<td></td>
<td>Student interviews</td>
<td>Every student</td>
</tr>
<tr>
<td>Start of introduction unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Throughout unit</td>
<td>Email Correspondence (53)</td>
<td>Teacher</td>
</tr>
<tr>
<td>Days 1-3</td>
<td>Video recorded class session (40 min each)</td>
<td>Teacher and class</td>
</tr>
<tr>
<td></td>
<td>Screen Recording (1 computer, 40 min each)</td>
<td>One student</td>
</tr>
<tr>
<td></td>
<td>Field notes</td>
<td>Teacher and class</td>
</tr>
<tr>
<td></td>
<td>Audio teacher reflection at end of day</td>
<td>Teacher</td>
</tr>
<tr>
<td></td>
<td>Student reflection</td>
<td>Every student</td>
</tr>
<tr>
<td></td>
<td>Teacher worksheets/materials</td>
<td>Teacher</td>
</tr>
<tr>
<td></td>
<td>Completed student work</td>
<td>Every student</td>
</tr>
<tr>
<td>Day 4</td>
<td>Same as days 1-3</td>
<td>4-5 students per group</td>
</tr>
<tr>
<td></td>
<td>Student focus groups</td>
<td></td>
</tr>
<tr>
<td>Day 5</td>
<td>Same as days 1-3</td>
<td></td>
</tr>
<tr>
<td>Day 6</td>
<td>Same as days 1-3</td>
<td>Every student</td>
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<tr>
<td></td>
<td>Student to student interviews</td>
<td></td>
</tr>
<tr>
<td>Day 7-11</td>
<td>Same as days 1-3</td>
<td></td>
</tr>
<tr>
<td>Day 12</td>
<td>Student focus groups</td>
<td>4-5 students per group</td>
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<tr>
<td></td>
<td>Teacher reflection</td>
<td>Teacher</td>
</tr>
<tr>
<td>End of unit</td>
<td>Recorded audio of teacher reflection and planning (2)</td>
<td>Teacher</td>
</tr>
<tr>
<td>Between Units</td>
<td>Email correspondence (14)</td>
<td>Teacher</td>
</tr>
<tr>
<td>Start of application unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Throughout unit</td>
<td>Email Correspondence (24)</td>
<td>Teacher</td>
</tr>
<tr>
<td>Days 1-2</td>
<td>Video Recorded Class Session (40 min each)</td>
<td>Teacher and class</td>
</tr>
<tr>
<td></td>
<td>Screen Recording (1 computer, 40 min each)</td>
<td>One student</td>
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<td></td>
<td>Field notes</td>
<td>Teacher and class</td>
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<td></td>
<td>Audio teacher reflection at end of day</td>
<td>Teacher</td>
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<td></td>
<td>Student reflection</td>
<td>Every student</td>
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<tr>
<td></td>
<td>Teacher worksheets/materials</td>
<td>Teacher</td>
</tr>
<tr>
<td></td>
<td>Completed student work</td>
<td>Every student</td>
</tr>
<tr>
<td>Day 3</td>
<td>Focus Groups (by researcher)</td>
<td>Student</td>
</tr>
</tbody>
</table>
Table 4.3 Timeline of Data Collection

As can be seen in Table 4.3, prior to the students entering Second Life as part of their class work, I collected information about the general context of the school and online project, met with the teacher for planning and an initial interview, and visited the classroom to see the interactions occurring within the classroom without being in Second Life. My goal was to understand the purposes of the teacher and what types of practices were already part of the social space. During the introductory unit, I collected information relating directly to the teacher’s planning process and the interactions within the classroom. My goal was to understand what was happening during the roll-out of this new technology. After the introductory unit, I captured both the reflections from the introductory unit and the planning for the next unit she was planning to have. I also collected student work and the teacher’s reflection on her planning of classroom sessions as they related to the return to the online environment. During the second unit using Second Life, I collected data related to the interactions once again. However, my questions and discussions were more focused on the rationale for design and changes in design and the meaning behind the student interactions. After this final unit, I collected the student and teacher reflections.

Participant observer. Central to the design of my research is that I was a participant at this research location. I was a part of the study in not only my presence at the site but also as one who interacted with the teacher and even provided support to her
in her planning. Recognizing, as Heath and Street (2008) discuss, that "only rarely can we shed features of ourselves to be a "real participant" (p. 31), I acknowledge my ties to both the physical classroom and virtual technology environments. I was a participant at the site with a rich background in participating in virtual worlds and as a former teacher within this city school district context. In my role as an instructional technologist, the teacher led and made decisions regarding her own classroom, I asked questions to help her be more critical of her own decisions and provided suggestions when she asked for them.

As a participant at the site, I had access to data that a recording of the site would not provide. I was able to make decisions to probe specific areas of interest during the course of the class and planning sessions. This allowed me to elicit deeper revelations about the thinking of all participants, teacher and students. I was also granted access to privileged information of the participants, as they shared thoughts and perceptions during our interactions, which emerged as part of the activities. This level of access to the interactions at the site is critical for understanding the construction of the social space as identified in my research question and described in my theoretical framework. I need to understand not only the actual activities occurring but also the perceived and conceived space as described by Lefebvre (1991).

I was also situated to see the ongoing interactions occurring around the negotiation process in which the teacher engaged as described in my research question. The negotiation process is also a nuanced aspect of the site that the participants themselves may not be aware with whom they are actively engaged. Heath and Street (2008) explain that participants in a site “use tacit meaning-making processes that they
take for granted, and their explanations of these often bear little relationships to realities of usage” (p. 8). In order to understand the processes occurring at the site, I needed to be not only observing but also engaging with these processes so that I might identify the patterns that emerge within the site and across the data. In order to capture these interactions, I made video recordings of the classroom interaction, recordings of the online interactions, and my own field notes.

**Recorded class sessions.** I video recorded each course session of the two-week introduction unit and the mini-unit the teacher conducted later in the year. The recordings provided me a means to return to the interactions occurring in the classroom. When attempting to understand the way that practices are negotiated, using video can be a strong method for revealing small interactions and cooperative participation. Fele (2012) found in his research on workers in an emergency room, that cooperation and tacit participation can be revealed through video analysis. Luff and Heath (2012), in their discussion on the more mundane issues that can impact the effectiveness of video data, suggested that the perspective of the video (and audio included with the video) is often determined by the restrictions of the space rather than the purpose of the research. The physical layout of the classroom restricted the placement of the recording equipment to two locations. I addressed this in two ways. First, I attempted to set up the camera to capture the majority of the room. This allowed me to see the interactions across the classroom space. Secondly, I alternated between the two possible locations so as to capture a variety of interactions. Students typically sat in the same location each time providing consistency as I switched the recording location. I reviewed the video of the
classroom session and took rough notes within three days of the actual class occurring so that I could add any additional notes from my field notes to the recording notes.

In addition to classroom recordings, I also audio recorded the interviews, reflections with the teacher, and the planning sessions between the teacher and myself to be able to dive deeply into what the teacher was attempting to design through the planned activities of the class sessions. As part of the iterative process of the data collection and analysis, I reviewed the day’s activities through a recorded session debrief with the teacher at the end of each day. The post class reflections with the teacher provided a view into her own thoughts on the way the lived classroom met with her expectations in the design as well as to reveal any surprises she might have had in regards to the activities.

**Screen recording/virtual world recording.** When online technology is being foregrounded in a particular study, field observations can involve participation in that environment in different forms, from a 'lurker' who reads and captures the posts being created to a full participant who has created an avatar in a 3-D virtual environment and thus is visually a part of the interaction (Schroeder & Bailenson, 2008). Often the software itself can capture these observations in the form of chat logs or screen recordings. These recordings do not capture the sidechannel and backchannel (Yardi, 2008) conversations that often are occurring whereby the individuals interacting through one tool may be having individual interactions through another tool or medium. That is, those in a chat room, discussing a specific idea or topic, may also be discussing the interaction occurring through an instant messaging tool. Layered on top of this are the interactions that are occurring in the physical space in which the individual is
participating. This awareness becomes more important when thinking about students in a classroom who may actually be in a computer lab setting when they are posting. I had to make a decision regarding if and how to capture each additional level of interaction.

I chose to utilize screen recording software to capture the interactions of one student participant in each class period when in-world. Although a greater sampling of student online interaction would have been preferred, I was only able to select one student due to the restrictions of the hardware available. The district allowed me to connect my personal laptop with the necessary software for recording to the wired Internet but did not allow the recording software to be installed on their computers for security purposes. As the software records interactions from that student’s perspective, this recording did also capture the actions and messages of those students who were close to the one being recorded. I selected the students to be recorded based on who sat at my laptop on the first day of the sessions. As students didn’t have assigned seats, this was a random assignment.

**Interviews.** In conjunction with the participant observations, I perceived a need to delve into the interpretations, viewpoints, and meaning being made by the participants, teacher and students. This approach is very common when conducting research across online and face-to-face settings (Kendall, 2008). This priority was especially important as I am attempting to understand the negotiation of the practices within the classroom. The reflection sessions with the teacher each day were open-ended interviews in that they were conducted to elicit the teacher’s thoughts regarding the activities in the classroom and so were directed by the teacher’s own thoughts and my prompting questions. In
addition, I utilized interview techniques during the planning sessions with the teacher to encourage her meaning making during the design process. I conducted two student interviews and two focus group sessions with students. I conducted one of the student interviews and one interview was a peer-to-peer interview. I provided the questions that they were to ask but the students were encouraged to speak about the topic I provided as much as they would like.

I conducted multiple interviews and focus groups to span the time of the study. This approach allowed for additional triangulation of both the methodology as I interviewed multiple individuals, as well as the concepts being developed, as I worked with the same individuals through multiple methods. The interviews were open-ended, with the questions emerging from the document review for the first interview and the ongoing observations and analysis for the second interview. These interviews were spaced evenly throughout the study to allow for a look across the time. Although some researchers recommend that interviews need to be at least 45 minutes to gather good data (Seidman, 2006), I recognized that this extensive of an interview would be difficult for the students in terms of comfortability. Thus, I planned for 10-minute sessions as this allowed for conversations without feeling as if I was placing unreasonable expectations on the students. These interviews were reviewed and chunk coded within two days of conducting the interviews to help inform additional data collection.

The interviews were not meant as a means to use multiple views to reveal the truth of the situation or the process. Rather, the interviews were broadly focused on the events and interactions as viewed by the participants. My goal was to understand the
meaning each was making of the situation at that moment. This is not an averaged or melded view of the interactions; rather it recognizes the unique meaning being made by each and how these lend to the construction of the social space.

**Participant reflection.** Recognizing that two ten minute interviews would not provide a depth of insight into each student’s ongoing thoughts and interactions, I asked each participant to author a daily written reflection. At the end of each session that I observed, students and teacher were asked to reflect on their experience for the day. This did not create additional strain on the students, as the teacher was interested in building this assignment into the course for the purpose of practicing English and providing reflection on learning. The questions for each of these reflections consisted of written answers to open-ended prompts such as, “What did you learn today in Second Life?” or “What did you do with someone else in Second Life today?” Additionally, the students were asked to take one in-world picture that they felt best documented what they did or learned that day. They attached their selected picture to the reflection that they composed. Smith, Gidlow, and Steel (2012) also found the use of pictures as a means to elicit deeper reflection in the exploration of social experiences in the context of a school-sponsored program.

**Focus groups.** Student focus group sessions provided an additional view into the students’ perspectives about the purposes they were bringing into the classroom as well as the meaning being created through the interactions. These also provided a venue for me to jointly reflect with the students on the design of the activities, the perceptions they had regarding the teacher’s change in activities, and their own experiences with the
technology. Use of this method for these purposes aligns with the critical elements of a focus group as described by Stewart, Shamdasani, and Rook (2007). They suggest that focus groups should be focused on a particular, concrete situation and be used to not only understand the situation but also see how the group interacts. I utilized the teacher’s existing groupings of students that she used for projects for the focus group sessions, as this is a trend in the field that acknowledges the importance of more natural interaction of a group (ibid).

I did not use the group as a means to elicit more in-depth data, as there is little research showing that this actually occurs (Stewart, Shamdasani & Rook, 2007). Rather, I utilized this method for two primary reasons. First, I saw that the comfort of speaking increased for these students as they were able to utilize one another as language resources for communication. I also used this method to understand the profusion of specific answers within the context of other responses. I did this by asking a few simple questions but explained that responses could not be the same as someone else’s. When students would say that the other person ‘took’ their answer I asked them to either explain it differently or provide another answer. In this way, students developed more complex responses together as they built upon each other’s ideas.

These six collection methods provide multiple views to help to ensure that the analyses were rich and trustworthy. I designed these methods to target specific areas of inquiry (e.g. tensions, perceptions of teacher goals, perceptions of the classroom and technology being introduced) while remaining open enough to allow unexpected areas to arise.
Analysis of the Data

My analysis directly aligns with my research questions and theoretical framework. As my questions look to understand the complicated interplay of design, practice and social space, I utilized de Certeau as a primary analytic lens. His practice-based theoretical frame was an appropriate match for my own use of social practices as my unit of analysis.

The first step of my analysis was to transcribe the data. I recognize that transcription is a part of the analysis, whereby I decided what to transcribe and how to transcribe it. However, as will be seen, I did not utilize my transcriptions as a complete and total representation of the occurrences in the room. I utilized these merely a means to identify important portions or occurrences. I returned to the video and audio data often to ensure I did not inappropriately prioritize the transcribed text of complex and multi-modal interactions.

I created complete transcriptions of each interview and focus group. I then created transcripts and descriptions of the classroom videos. In this first level, I created general descriptions of the actions as they occurred. I transcribed the on-screen recordings with a dual layout to identify those portions of the recording that were chat transcripts, recorded audio or instant messages. I did an initial identification of the major topics for those portions that had Spanish. This allowed me to know what portions of the recordings were potentially relevant to my work. I then had a native speaker translate the relevant and needed portions to ensure accuracy. Though I was not able to have a native speaker for each of the six countries represented in the room, I did ask the translator to identify any
phrasing that seemed unusual so that I was aware of the potential for more nuanced usage of the language than I had access to.

The next step in my process was to code for significant concepts from my theoretical framework. I purposely elected to work directly from the theoretical framework I have presented earlier, as I built this framework after the initial pilot analysis I had conducted. As such, the framework was developed from a more open approach to the data. Additionally, as I moved through the analysis, I ensured that significant data, moments, or artifacts that diverged from the analysis I constructed were examined. I labeled each of these as an ‘interesting story.’ I made the decision if this non-conforming data impacted the discussion on my specific questions or if it addressed a different question and thus may be put aside for future analysis.

As my analysis should be rooted in my framework, I first coded for practice. In understanding the classroom social space, I focused my analysis on the practices that formed the inter-relationship of that social space and thereby constructed it rather than merely the elements of it. I looked at the social practices that shape the social space. I defined social practices as, “Practices are socially evolved and meaningful ways of doing things or getting things done.” As such, I entered the data looking for these social practices. I identified the classroom recordings, field notes of classroom sessions, and screen recordings as primary inform sources related to the identification of practices. In these data I can “see” the social practices being developed and lived. As practices are both action and the meaning attached to those, I first identified the common actions and interactions occurring in the classroom. From these actions/interactions, I looked at 1)
what was the work being done and 2) what was the meaning that the teacher or students were attaching to those practices.

I utilized the following categories of responses and actions as my guide for identifying “work being done.”

1) Responses to “What are you doing right now?” during class time. This response engendered their definition of their action. At first students responded with the action as it related to the assignment (e.g. this handout). After I diffused that, they would tell me what they were doing (e.g. designing an outfit).

2) Groups of actions that I see being used or done frequently in the classroom setting (e.g. chatting in Second Life or driving cars).

3) Actions that had an immediate observed outcome (e.g. getting the teacher’s attention by raising hand or getting the teachers attention by calling out).

4) ‘Chunks’ of interaction that I defined with a common theme or focus (e.g.: ‘Discussion about using money in Second Life”).

5) Groups of actions or processes that are described by participants as a set. (e.g. completing an assignment).

Using the definition of practice and criteria for defining it, I examined all of the transcripts of the interactional data within the classroom and identified 103 different activities that the teacher and students were engaged with (See Appendix A). From the 103 activities, I looked at the types of work being done or ways of doing things within the classroom that were met by these actions or activities. Although some items did not meet a category, I was able to identify six different categories of practices occurring within the
classroom. It must be noted that there were additional activities that occurred outside of the classroom setting that are not included on this list but certainly had impact, such as the teacher planning or grading. The categories listed here, followed by definitions of each, were those observed in the classroom setting itself.

1. **Teacher set-up/"teaching"):** This category of getting things done has to do with the ‘teaching’ part of each lesson. Although my definition of teaching is broader and certainly involves a variety of interactions, I am utilizing the definition of teaching as provided by the teacher and the students, who viewed teaching as that practice of the teacher providing information, directions or processes to the students. This may involve only the set-up for the day (ie. Giving directions for the rest of the lesson) or it might involve a longer time when the teacher is looking to provide information or explain a process. This was whole group in every circumstance and typically occurred at the beginning of the lesson. This category covers both the teacher’s act of ‘teaching’ and the students’ act of listening or following along.

2. **Getting Help:** These are the process by which students get help in the room. This may be in regards to figuring out how to do something, having computer problems or being ‘stuck’ in world. Seldom did this relate to asking for help in completing the actual writing of the written work.

3. **Keeping students on task/work:** These are the ways that students were redirected to the task or work provided for that day. Typically the teacher or
occasionally the researcher in his teacher support role did this. However, there were some instances when students took on this role as well.

4. **Interacting with others for own purpose:** These are the activities engaged with when interacting with others. These are interactions NOT for the purpose of getting help or completing assignments but rather interactions that occurred for some other reason or purpose.

5. **Activities with technology for own purpose:** These activities are those where the participants are using the computer or computer program features or functionalities to do something for their own purpose. That is, these are not those activities directed by the teacher as part of the assignment or lesson set-up OR they are alternative methods to reach goals not sanctioned by the teacher (for example- getting help through email rather than reading the directions as directed by the teacher).

6. **Completing assignments:** These are the activities that occurred in relation to completing the assignments. In this, I am primarily focused on the student’s actions as the teacher’s participation in this process had more to do with the initial planning, the subsequent grading or 1 and 3 on this list. There was also significant overlap with this category and 2, 3 and 5 on this list.

   **Coding for design:** In order to address the influence of the teacher’s design work, I needed to understand what the work of design that the teacher was doing. The teacher’s design work was complex and complicated. The focus of the design and even intent of her design changed over time. I was able to track these changes through the decisions she
made about her design as voiced during planning sessions and seen in her lesson and unit planning.

I coded for any statements where she described her *reasons* for using Second Life or what she hoped would be different in her classroom when using Second Life. Once I had coded for *reasons, hoped-for use*, and *hoped-for change*, I examined the content of each of these different areas. There were 89 coded statements that I found relating to her reasons for using Second Life in her classroom. As a part of the protocol I followed during our planning sessions and reflection sessions, I consistently asked two questions when broad statements were made: Why? or How? If the teacher stated she wanted to do something, I would ask her why? If she stated that she had a goal or would like to see something achieved, I would ask how? This questioning allowed me to gain clarity into 56 different times when she did not include her rationale in her initial statement. I was then able to analyze these rationales and look for commonality. I identified seven categories of different hoped for outcome - rationale pairings from this data.

With these categories defined, I worked from the dual examination presented in Brady, White, Davis, and Hegedus (2013) of activity structure and participation structures. I looked at the design artifacts as unique and separate from the observation data of classroom interaction. I was able to go back through my complete data set of *design artifacts*, such as, teacher lesson plans, worksheets, and student work, as well as the observable design in the classroom of lesson format as shown by directions of the teacher, and align the events of design with the purposes she had stated. I additionally looked at student actions or statements that also aligned with these initially desired
outcomes, recognizing that though the teacher may be viewed as the primary one with
design power, students’ take-up of this design or even initiation of other trajectories of
design was also important.

Content analysis using the basic code categories. Once I identified these basic
code categories within practice and design, I conducted a content analysis of the different
code categories. My goal was to identify how the participants defined these elements and
processes. This provided me with selected data from participants that I could develop into
a description of each elements or process. However, I did not wish to essentialize the
different perceptions of the individuals or suggest that there can be one definition.
Therefore, I first sub-divide the responses into those of teacher and students. This
decision was not meant to polarize their responses, but was in recognition of the
historical organization of the social space found in classrooms in general. I did
additionally look for any other sub-groupings to emerge that defined different
conceptions or perceptions based on other social, historical, or spatial factors. I found
important groupings for analysis to also be the difference between the boy and girl
responses and those students who provided help to others. I did not find other groupings
meaningful in my analysis.

This content analysis allowed me to identify the specific practices that were
perceived as expected by the teacher as the person of power within the social/historical
context of the classroom space. These were labeled as ‘proper’ practices, utilizing de
Certeau’s (1984) term for legitimized practices. This approach provided me with the
context of the social and historical practices situated within that space. Understanding
what potential practices were perceived to be available within the space and which were perceived as ‘proper’ and therefore more available within the space provided a foundation for examining the way that all participants took-up the practices and therefore the design of the social space.

**Analysis for changing space.** As I have mentioned in my theoretical framework, I do not see it as helpful to analyze the individual elements of social space as a means to explain the social space. Social space is the complex interaction of all aspects of the space. As such, my analysis needed to provide me with a holistic view of the changing space and practices that was also meaningful for understanding what was happening at a more micro scale. I returned to the data to do paired or cross-data analyses. As the teacher and students both discussed class periods as distinct entities, and as the teacher also reviewed and potentially redesigned between each class session, I selected the class periods as specific and identifiable spans of time to analyze as a whole. This decision was not meant to essentialize the process to a specific point but rather to identify points in the process as ‘snapshots.’ These points acted as intersections and thereby allowed me to trace specific lines of inquiry through and across these periods. In this way, I did not assume connection of interactions until I had a chance to analyze the relationship that defines these interactions both at the moment but also across time.

Through parallel analysis I examined each day spatially across the classroom video and my observations: comparing the movements of those in the classroom with the movements within the online, interactional space. I displayed the two videos on two screens and started them at the same moment. This allowed me to see and hear what was
happening in the classroom and in-world without isolating each. This approach aligns well with my theory and also allowed me to identify significant instances when interactions in one video had impact on the other. I also was able to examine each day’s practices through connections between the designed lesson documents, recorded planning session of the teacher, and interviews with participants as well as to the recorded reflection of the teacher and the student artifacts and reflections. I was able to examine the way that the interactions positioned the affordances, potential practices, and proper practices. I saw how each desired outcome was and was not negotiated by the teacher through her ongoing design process and how it was lived out in the classroom social space. Through these tracings across the data, I connected multiple points of interaction and could document the trajectories of practice being traveled.

Utilizing the codes and coding categories already created, I charted how each practice and initial desired outcome was enacted (or not) across the spaces throughout the time of each lesson. I captured what happened through counts of the practices and interactions. I captured how it happened by tracing these actions and interactions within the double space of the parallel analysis. I captured why it happened through the analysis of the follow-up interviews, reflections sections, and my own field notes. This process allowed me to develop snapshots of each day and then follow the progression of changes over the time of the units.

Once I had these snapshots compiled, I was be able to examine the practices as strategies or tactics of practice and identified how the social space construction process and definitions changed (or did not change) with the different practices. I was able to see
what significant stories emerged as I identified when strategies or tactics were employed, who employed them, what activities were involved in their use, and how the co-construction of the elements and processes classroom social space were impacted by the use of these practices. It was through these successive steps that I built an understanding of the processes of developing practice and changing social space. Through the final step in my analysis, I was able to ask my research questions of the data. In my findings I will identify the exact ways that I addressed aligning the analysis described above to each of my questions that revealed the specific findings.

**Concerns and Limitations of Research Design**

Beyond the limitations and considerations discussed throughout this study already, there are overarching concerns that should be recognized. By documenting these concerns, I am not looking to question my design. Rather, I am recognizing that research design looks to pair methods to research question within the context of the study. As such, there will be instances where the very complexity of the question or the nuances of the context engenders a design with unknown aspects. These unknown or uncertain aspects need to be recognized by the researcher to ensure that they will be addressed during the research and analysis. Thus, I document my areas of concern to assure the reader that these aspects are known in their unknowability.

**Concerns of online research.** The most salient concern to this study is the issue of researching in online spaces. The distributed and open nature of online research provides unique issues and considerations. Reading from a range of researchers who have looked at the use of the Internet as a site for research, I have identified the following
critical issues that must be addressed (see Table 4.4). (I have numbered these issues for convenience of reference and not as a denotation of priority.)

<table>
<thead>
<tr>
<th>Concern</th>
<th>Addressed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Can we transfer the tools of research to the online world? (Jones, 2004)</td>
<td>Utilizing the process of established research and adjusting methods to match the mixed environment</td>
</tr>
<tr>
<td>2 How do we keep a clear research focus when crossing disciplines of research? (Livingstone, Van Couvering &amp; Thumim, 2008)</td>
<td>Clearly situating the area of research within existing fields (see literature review)</td>
</tr>
<tr>
<td>3 Online technologies are changing: How do we tell what is the technology and what is practice? (Anderson, 2008)</td>
<td>By using a practice lens, technology becomes a part of the larger, complex, interactional space and not merely an initiating cause with practice the effect.</td>
</tr>
<tr>
<td>4 Can ethnographic methodologies be used in a setting where the participants or their interactions are dispersed? (Leander; 2007)</td>
<td>Using virtual ethnography (Hine, 2000) that examines interactions and participants as part of the culture under study rather than a physical location as the defining characteristic of that culture.</td>
</tr>
<tr>
<td>5 How do we examine artifacts that are socially constructed, spatially distributed and constantly changing? (Burn, 2008)</td>
<td>Through analysis of the process of production and the artifact itself as a single unit of observation.</td>
</tr>
<tr>
<td>6 How do we make meaningful analysis from the crossing of offline and online? (Sade-Beck, 2004)</td>
<td>Elimination of the online/offline dichotomy through analysis of social space or interaction space.</td>
</tr>
<tr>
<td>7 What about the people that participants interact with online who are not part of the study? (Kendall, 2008)</td>
<td>Analyzing these individuals as interactants and not participants. Their anonymity is maintained through the use of avatars.</td>
</tr>
<tr>
<td>8 How do we develop trust and relationship for interviews in this type of setting? (Madge &amp; O'Connor, 2002)</td>
<td>A focus on the individuals in the physical classroom allows me to develop trust.</td>
</tr>
</tbody>
</table>

*Table 4.4- Documented concerns of online research and ways each are addressed.*

Each of these questions relate to either ethical issues or design issues when developing my study. By maintaining the focus on those in the physical classroom I observed, I reduced the concerns identified in #s 7- 8 above. However, there were other classes that were also involved with this project. There were times when those individuals
interacted with the students and teacher in the study. This situation brings up methodological issues such as the use of ethnographic methodologies where participants are at remote and varied sites (Leander, 2008) and ethical issues such as, to what extent do you need to gather permissions from those interacting online, when it is a public area and the individuals are interacting through avatars (Jones, 2004)? My focus on the local individuals may have limited the complete understanding of this space but did also help to ensure ethical integrity of the study. As the remote individuals are also identified only through their school and avatar and I have no access to actual names associated with these avatars, I further feel that the ethical concerns mentioned above have been addressed. However, I have yet to address select research concerns.

**Cultural practice lens.** Due to lack of time and access to the appropriate data, I did not examine the ways that students’ former practices, both inside and outside of the classroom, influenced the trajectories of practice that emerged. We are left with questions such as:

- Did the students already have a certain amount of fluency with practices that developed space for interaction outside of the teacher’s direct oversight through the use of Spanish as an interactional tool?
- Was the choice to develop help structures from and for the group a reflection of cultural practices that prefer and value the success of the group and not just the individual?
- Was the teacher’s focus on the individual mastery of skills, both technical and linguistic, emergent from her own cultural and personal experiences?
The additional understandings that would emerge when repertoires of practice (Gutierriez & Rogoff, 2003) meet the great reserves of practice (de Certeau, 1984) made available through inclusion of technology is something that only a few have examined, but is essential to building our understanding of how trajectories of practice develop and maintain directionality. Although a deeper level of understanding would be made available through this analysis, I have addressed any concerns of not recognizing the voice of the participants in my study through deep descriptions and reflective interviews/focus groups and my analysis that examines not only the actions but the meaning embedded in those actions as social practice.

Curricular/content area. The teacher’s circumstance was different than many studies of technology integration as the content/curriculum of her class was using technology. Additionally, although there was a secondary curriculum in this particular classroom, that of developing proficiency in English, it was never measured as part of the curriculum of the classroom. Thus, I am only able to speak to the affordances taken up by the students through their practice and not how this same approach might have worked in a setting that had the additional requirement of learning content through the use of the technology. This study still adds value to the field, however. There are very few studies that study this type of technology, virtual environments, as a part of the school day or embedded in the curriculum of a course. Frequently studies are of a special project or an after-school/informal setting. In this study, the teacher endeavors to embed the technology as an ongoing part of her course and as such faces the issues of curriculum, assessment, lesson design, grading, and bell constraints. As such, this study will still
serve to advance our understandings of the integration of online, immersive technologies in school settings.

**Validity of the Study.** In any study, the researcher must address issues of validity of that study. In qualitative research, the validity (Marshall & Rossman, 2006) or trustworthiness (Lincoln & Guba, 1985) can be spoken to by addressing four different criteria: credibility, transferability, dependability, and confirmability. Credibility is understood as the believability of the study by the participants in the study. As my study is endeavoring to describe and understand a complex interaction, only those within that interaction can verify that credibility. One method I used for addressing this issue throughout the data collection and analysis process was to ensure that I used “thick description” (Geertz, 1973) which utilized, to the extent possible, participants’ own words and reflections. Coding also utilized, to the extent possible, participants’ own words or in vivo coding (Charmaz, 2006). I have also discussed my findings after each year with the teacher from the case study. She and I discussed the work I was doing and the initial understandings I had. This step provided a preliminary member check to verify the initial categories and understandings.

Transferability is the second criteria of validity and relates to how the findings in the study might apply to others within the study’s specific area of focus. I addressed transferability with a thorough description of my process of analysis, the assumptions with which I entered the study, and the context of the site. The use of a specific class for study also helps in transferability. Through the process of defining the class and thus
Bounding the research, I provide the framework from which others may identify the appropriateness of my findings in their own context, research and research questions.

Dependability of a study is often suggested as being the qualitative version of reliability in quantitative studies. Reliability examines the replicability or repeatability of a study. The essential purposes and assumptions of qualitative study, however, assert that a study is not replicable in that all interaction is situational and complex. The situation changes as people change. In addition, my particular study is looking at the intersection of many trajectories that is continually creating the social space. In this, I recognize the need to address dependability within a context that is continually changing. It is for this issue of dependability that I have multiple data collection methodologies. By studying each day as its own snapshot or event, I am able to examine the complexity of the context while also exploring the ongoing change. Through my analysis and the development of the study itself I have triangulated this data to ensure that my themes and categories are well supported by different data.

In qualitative research it is recognized that the researcher brings a unique perspective to the data set. In addition, with participant observation as one of my methodologies, I purposely infused myself into the context. As such, other researchers need to feel that there is confirmability within my study. This provides the means for other researchers to confirm that the findings do indeed draw from the data. There are three approaches that support meeting these criteria. First, I utilized other researchers or ‘critical friends’ to examine the work to ensure that my findings can indeed be drawn from my data. In addition, the dissertation process itself has a committee that has acted
within that critical friends role for the purpose of confirmability. Second, I clearly articulate the interpretations being made along with the logical assertions I needed to make to arrive at my findings. Finally, I have purposefully presented the instances that do not fit the themes and categories that emerged and led to my findings.
Chapter 5: Findings

Introduction

My research questions cannot be truly separated in to discrete and separate questions as they are interconnected in both theory and in operationalization. My findings are by necessity not only interwoven but build upon one another. My questions seek to understand the changes of practice and the classroom social space as the teacher designed for the inclusion of a new technology. Moving beyond a simple cause/effect relationship between the introduction of technology in to the classroom and a specific variable of measure such as academic achievement, I recognize the complex nature of a classroom social space. I sought to examine 1) the way that practice and social space changed as the technology was introduced and 2) the reciprocal influences that the changing practice had on the construction of the social space and the changing social space had on the practices.

Underlying this analysis is an understanding that social practices and social space are ever changing and evolving, as they are both lived in the day-to-day activities and interactions. Additionally, the classroom social space is situated within a larger school organization that has embedded practices, restrictions, and affordances of both space and time with the means of enforcing specific practices. This organizational context can be seen in the entry into the school with its metal detector and 20 foot signs listing what students are not to do. This can also be heard on the daily 5 minute announcements containing 3-4 minutes of time spent to reinforce a different rule or procedures while actual information is only provided for 1-2 minutes. It is within this broader school
context and understanding of the continually negotiated nature of practice and social space that I present my findings.

My questions focus on the way that design, practice and space interact with one another over time as each is changed. The impetus for this study is the purposeful change that the teacher elects to make to her classroom by including an online, interactive technology, Second Life. As I am examining the changes occurring over time, I present portions of my findings as a cascading impact from the initial point of the teacher's design decision to include Second Life in her classroom. My choice to present the findings in this way will create the sense of single direction, as that of falling dominoes. Though I attempt to demonstrate the way that each aspect of design, practice, and social space, influences and has influence on the others, the reader must bear in mind a view of pebbles dropped in a pond rather than falling dominoes. The teacher certainly has design decisions to make and implement; however, the multitude of ripples that appear, intersect, and are reflected off the shore and each other create changes that cannot be fully predicted, controlled, identified nor individually analyzed.

I present each finding along with the corresponding research question to facilitate the building argument embedded in the progression of questions. Finding 1 identifies the changes in the space that occurred when Second Life was introduced and how these were taken up into the developing practices. Finding 2 discusses the influence of design on practice and how these changing practices influenced ongoing design. Finding 3 examines the resultant nature of the social space that was constructed by these changing practices.
Research Finding 1: As the space was decentered, the practices became diverse and dispersed.

Research Question: How do changes in spaces shape the social practices over time?

What I am looking to understand in this particular question is how the increased availabilities or restrictions by the space of certain practices help to provide direction to the form or shape that the practices take. I found that the changes in the space do indeed influence the shape of the social practices. I am not suggesting that the changes to the space shape the practices like a cookie-cutter; precise and with a set shape. Rather, all of the various interactions and components of the social space do have impact on the way and form that the practices are taken up.

To be successful in understanding the influence of the changes to the space and spatial resources on practice, I will first identify the changes that happened to the space in the classroom and to the types of practice occurring in the classroom. I will then show how the participants took up these changes in space through practice. From this, I will make the case that the changes in the space did not shape the practices but rather changes to the classroom and its resources provided opportunities and tools for students to more fully engage with the development of the social practices.

Changes to the space. As my questions look to understand the effect of change through teacher design, the initial inquiry began with understanding the social space as it existed prior to the teacher implementing her design for the integration of Second Life. Thus, I analyzed the social practices that were referenced during the teacher’s planning
sessions discussions, reflective descriptions during student interviews and my field notes of three classroom visits prior to the start of the unit.

There were many changes to the space and spatial resources as a result of the Second Life Units. The teacher intentionally implemented some of these while others were functions of the technology or layout that resulted from the changes the teacher intentionally made. For this section, I am focusing on the changes to the space and spatially resources that influenced the practices without examining the intent of those changes.

First, I will identify the changes in the space. In Table 5.1, I outline the changes to the space itself. The first change was that of the location and possible methods of interaction. The second was that of the resources in the space (both provided and continuously available). The data for this table comes from both my own observations in the classroom as well as my question of the teacher asked during the planning sessions in September prior to the unit, “What will be the differences for the students during the Second Life unit?” After outlining these changes to the space and interactional tools, I will further describe these as they relate to the pressure that they place on practice.

<table>
<thead>
<tr>
<th>Location of interaction</th>
<th>Prior to Second Life units</th>
<th>During Second Life units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tools of Interacting available</td>
<td>Verbal (in English and Spanish) Written Cell phones (though restricted by school policy) Email (when students had laptops)</td>
<td>All of those available in the classroom PLUS “Chatting” (requires proximity in Second Life) Instant Messaging (IM’ing)</td>
</tr>
<tr>
<td>Teacher-distributed/controlled resources</td>
<td>Laptops, Smartboard, handouts/worksheets</td>
<td>iPod Touches (distributed daily), handouts/worksheets</td>
</tr>
<tr>
<td>Resources of the Space for Students</td>
<td>Desks, chairs</td>
<td>Desks, chairs, computers, Second Life</td>
</tr>
</tbody>
</table>

Table 5.1. Difference in Space with Different Designs of Units
Expansion of the interactional space: With the Second Life units, the classroom space was expanded through a) movement from the classroom space to the computer lab and b) the provision of an additional, alternate space in the form of Second Life.

The first major change to the space was that Ms. Savvin moved from the classroom to the lab setting. This shift was more significant than merely a change in venue. Though there was a projector in the lab, there was not the same ‘front’ space as in the classroom. In the classroom all desks faced the location of the teacher, the whiteboard. In the lab, there were two rows that did face the front wall, however, there were another two rows of computers that faced the side walls. This meant that there was less of a clear ‘front.’ In addition, due to the layout and lack of space, the teacher could not actually stand at the front of the room though her computer was projected to that front. She had to be in the middle of the room to operate the projector. Thus, the teacher stood behind the students as all focused on the screen. This shifted the focus from the teacher to the screen.

Though eight computers faced towards a front, there were an additional seven that faced the sides of the room. The teacher’s computer was in the middle of the room and the teacher’s screen was visible (and accessible) to students passing from one part of the classroom to another. The teacher was in this way behind the students. Though this could be seen as more panoptic in that she was able to quickly scan and view what each student was doing on his or her computer, the focus of the students was more on the computers and less on the teacher. The shift to the lab setting provided dramatically increased opportunity for student interaction through increased proximity to each other. It also
physically rearranged the orientation of focus from a front location, dominated and controlled by the teacher, to the individual screens and computer stations of each student.

The second change to the interactional space was the inclusion of Second Life. Access to Second Life provided the interaction tools of chatting, instant messaging, and using the avatar to perform various actions or interactions, making a total of 14 new interactive activities available (see Appendix A for list). This expansion of activity was also into a space that was more individualized. Within Second Life, participants do not have to be in the same location within the program to interact. While the chat feature does require proximity in-world, through the use of instant messaging, one can interact with a completely different people who are spread all over the Second Life world. This in-world version of side-texting was seen on forty-three different occasions during the course of the first Unit, but most notably on Day 9 when eight students were standing in close proximity to one another in-world but were interacting with one another (and others NOT in proximity) through instant messaging, so that there were actually 12 different conversation strands occurring during the same section of the class period. In this way, the space was not simply creating a single, second space for interaction, but rather allowed each student to have multiple interactional spaces with different individuals occurring in quick succession.

*Increased access to Spatial Resources.* The second set of changes to the spatial component was to the resources available to the students. In the classroom, the students had access to their desks, chairs, and the materials or resources that were either distributed by the teacher or brought with them and allowed to be at their desk, for
example handouts and laptops. In the lab, they also had continual access to the computers and the programs on these computers including Second Life. Even though Ms. Savvin had laptops for every student in her classroom, they were only provided when there was a specific task the teacher wanted the students to perform. However, in the lab setting, the computers were accessible to the students at all times. The students also had access to the iPod Touches for most of the Second Life units. These devices had mini-tutorials on them for how to complete the skills she eventually wanted them to learn and information (in Spanish and English) on some of the basic features in Second Life.

**Control over the online, interactional space.** The students had equivalent access to all the tools in Second Life as the teacher. In-world, all the rights for the participants were the same. That is, *what* you could do was a function of your knowledge of *how* to do it and not a function of your socially and culturally agreed upon role in the classroom. For example, Julian, a student who taught himself how to modify the characteristics of an object, actually had more control over that aspect of the environment than the teacher who didn’t know how to manipulate objects. The female students who ‘changed appearance’ by adjusting the individual settings of their hair rather than using hair from their inventory as the teacher had initially instructed, were demonstrating greater understanding of appearance manipulation than the assignment required. The students who creatively used items from their inventory in a way that effectively blocked students from another school who were harassing them were more valued as those who kept the peace than the teacher who was going to simply let the other teacher know about this infraction after class.
This is not to downplay the role of the teacher in this space, but rather to recognize the increased access to the resources and roles of that space. Access to the multiple forms of interaction and increased control over the space of interaction was further afforded as the online spaces could be viewed (and thus directed and/or controlled) only peripherally by the teacher. Students had the ability to be more independent and self-directed participants in the space as it related to the interactions and development of that space.

**Changes to practice.** Now that I have outlined the changes to the space itself, I will present how practices changed in that space from prior to the use of Second Life through the time that it was utilized as part of the classroom. Using the six categories of practice listed in my methods (Teacher set-up/’teaching’, getting help, keeping students on task/work, interacting with others for own purposes, activities with technology for own purposes, and completing assignments), I examined changes in average numbers of minutes practices within these categories were enacted, which provides an understanding of these practices as a portion of the class time. For the number of times a specific interaction or type of action was ‘seen’ in-world, I am referencing four different sources of data: 1) in-world view of the single student Gabriela; 2) my field notes, 3) student and teacher reports, and 4) in-class video. These four sources do not capture the full interaction occurring in the in-world space. However, these four data sources do provide a view into the way that the practices were being taken up.

I compared changes to the teacher’s practices as the space changed. In Table 5.2, I outline the change in the way the teacher spent her time, comparing the sample before
Second Life to the sample during the 10 days in the computer lab when students engaged in Second Life (eight days in Unit 1 and the two days in Unit 4). Those items marked with an asterisk on the bottom portion are combinations from the items on the top portion. For example, “teaching” is made up of setting up the day, explaining or demonstrating for the class and directing the students to get back on task. These terms are taken from the participants’ own meaning making. Thus, teaching is the term used to represent this direct, traditional approach, although I view teaching as encompassing all of the aspects listed in the chart.

<table>
<thead>
<tr>
<th>TEACHER</th>
<th>Classes Prior to Second Life</th>
<th>Second Life</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Avg min</td>
<td>Average part of time</td>
</tr>
<tr>
<td>b. Fixing computers/login issues</td>
<td>2</td>
<td>4.5%</td>
</tr>
<tr>
<td>a. Setting up day</td>
<td>6.4</td>
<td>14.6%</td>
</tr>
<tr>
<td>a. Explaining/demonstrating for class</td>
<td>19.2</td>
<td>43.6%</td>
</tr>
<tr>
<td>c. Looking at students computers/work</td>
<td>2.4</td>
<td>5.5%</td>
</tr>
<tr>
<td>a. Directing them to get back on task</td>
<td>5.2</td>
<td>11.8%</td>
</tr>
<tr>
<td>c. Showing students how to do something</td>
<td>5.8</td>
<td>13.2%</td>
</tr>
<tr>
<td>Participating/using computer/software</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>b. Using computer/software to interact/manage student</td>
<td>0.8</td>
<td>1.8%</td>
</tr>
<tr>
<td>Other (ie Talking to researcher)</td>
<td>2.2</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

Table 5.2. Comparison of teacher time spent in each category of practice, prior to and during Second Life units
* combined totals of common activities seen above

Of primary interest is the time the teacher spent interacting with students. Her ‘teaching’ shifted from 70% to only 30%. This allowed her more time to interact
individually with the students and their work (showing students how to do something, looking at the student’s computers, and participating in-world). Her time focused on individual students nearly doubled, from about 19% of her time to 36% of her time. There was a major increase in her time spent managing the technology (fixing computer/log-in issues, and managing the in-world activities). Some of this managing of the technology was that of facilitating use of the space (8.4%) and another portion of that percentage was skewed due to one day (Day 4) when she spent most of her time installing software. However, overall the changes were to an approach whereby the teacher was alongside the students versus in front of them.

**Student practices.** I also compiled a comparison of the student practices to provide a clearer picture of how the students were engaged with constructing the social space through these practices. As there were 14 students, each possibly engaged with a different practice, I could not present the data in the same exact format. Often while the larger group of students was focused on one aspect (completing the assignment), a smaller group was engaged with other activities. As such, I needed to present my data in a way that represents this as opposed to that of a single individual as was the case of the teacher. I provide the average number of students engaged with that practice per day and a percentage of time as it relates to the set of practices rather than to the total minutes of an average class session.

The students’ time in class before Second Life was primarily spent following along with the teacher, listening to her explanation, getting help from the teacher to work on the activity or assignment, or completing the paperwork and logistics. When
combined, the time spent focused on the teacher and her direct activities consumed most of the students’ time. Interactions with classmates, including getting and receiving help on the teacher-assigned activities constituted about 1/3 of the student’s time. Whereas pursuits of the students’ own interests (including that of exploring the software in areas not specifically taught or prior to the teacher teaching it) constituted only about 10% of their time.

Student practices also shifted and changed with the introduction of Second Life and the spatial changes made as a part of that introduction. One of the most significant changes was that the diversity of student activity increased. There were more students involved in different practices for longer. The types of activities that students were involved with also shifted. The amount of time spent following walkthroughs and listening to directions was cut in half. The time spent on getting and giving help increased, though it was a shift from the teacher provided help to fellow students. However, the two most dramatic changes were 1) in the amount of interactions with other students and others outside of the classroom, which more than doubled, and 2) the amount of time spent exploring the software on their own, which quadrupled.

<table>
<thead>
<tr>
<th>Student Activity seen</th>
<th>Classes prior to Second Life</th>
<th>Second Life</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Avg. min</td>
<td>Avg # of students</td>
</tr>
<tr>
<td>Following along on walkthrough</td>
<td>11.2</td>
<td>10.8</td>
</tr>
<tr>
<td>Sitting and listening</td>
<td>9.6</td>
<td>11.7</td>
</tr>
<tr>
<td>Talking with teacher in class</td>
<td>2.2</td>
<td>4</td>
</tr>
<tr>
<td>Writing on assignment sheet</td>
<td>5.4</td>
<td>13.3</td>
</tr>
<tr>
<td>Asking for help for completing assignment</td>
<td>3</td>
<td>4.7</td>
</tr>
<tr>
<td>Getting help from teacher</td>
<td>6.4</td>
<td>8.3</td>
</tr>
<tr>
<td>Asking for help for doing a process in the software</td>
<td>4.4</td>
<td>6.6</td>
</tr>
</tbody>
</table>
### Table 5.3. Comparison of student time spent with different practices, prior to and during Second Life units (n=14)

Through their exploration, students moved beyond the assignment of the teacher and engaged with activities of their own choosing. These student-driven experiences included: using the software to interact with others not in class, using the software to play with other students, and trying on different looks.

**Summary of change in practice in the classroom from before to during Second Life.** When combining the practices of the teacher and the students in the initial classroom, we develop a picture of a teacher-led classroom, where much of the time is spent with the teacher explaining, demonstrating or walking the class through the software. The students are generally, listening or following along, though a few are experimenting or “playing” with the software. When student need help, they ask the teacher who comes and helps them. Students are allowed to talk when they are working and so occasionally a classmate may also help out when the teacher is busy. Although they are working on the software, they also have assignment sheets that they complete with some assistance from the teacher. The student practices were spread across a

<table>
<thead>
<tr>
<th>Practice</th>
<th>Before</th>
<th>During</th>
<th>Change</th>
<th>Before</th>
<th>During</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asking for help to get computer working</td>
<td>0.4</td>
<td>2.6</td>
<td>2 / 0.6</td>
<td>5</td>
<td>7.2</td>
<td>50 / 4.0</td>
</tr>
<tr>
<td>Getting help from students</td>
<td>2.4</td>
<td>3.2</td>
<td>12 / 3.4</td>
<td>9.7</td>
<td>8.4</td>
<td>97 / 7.8</td>
</tr>
<tr>
<td>Giving help to others</td>
<td>0.8</td>
<td>1</td>
<td>4 / 1.1</td>
<td>8</td>
<td>4.5</td>
<td>80 / 6.4</td>
</tr>
<tr>
<td>Getting up and moving</td>
<td>1.6</td>
<td>1.2</td>
<td>8 / 2.2</td>
<td>6.6</td>
<td>6.2</td>
<td>66 / 5.3</td>
</tr>
<tr>
<td>Talking with student in class</td>
<td>7</td>
<td>7.3</td>
<td>35 / 9.8</td>
<td>17</td>
<td>11.1</td>
<td>170 / 13.7</td>
</tr>
<tr>
<td>Using software to complete assignment (independently)</td>
<td>9.2</td>
<td>10.7</td>
<td>46 / 12.9</td>
<td>17.6</td>
<td>13.4</td>
<td>176 / 14.2</td>
</tr>
<tr>
<td>Using software to interact with those not in class</td>
<td>1.8</td>
<td>3.2</td>
<td>18 / 1.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using software to chat/talk</td>
<td>2</td>
<td>2.2</td>
<td>10 / 2.8</td>
<td>11</td>
<td>12.2</td>
<td>110 / 8.8</td>
</tr>
<tr>
<td>“Playing” with software</td>
<td>1.2</td>
<td>1.4</td>
<td>6 / 1.7</td>
<td>14</td>
<td>9.4</td>
<td>140 / 11.3</td>
</tr>
<tr>
<td>Trying out tools on screen not taught by teacher</td>
<td>3</td>
<td>4.2</td>
<td>15 / 4.2</td>
<td>8</td>
<td>5.2</td>
<td>80 / 6.4</td>
</tr>
<tr>
<td>Building/creating on own</td>
<td>1.4</td>
<td>3.6</td>
<td>7 / 2.0</td>
<td>0.8</td>
<td>1.2</td>
<td>8 / 0.6</td>
</tr>
</tbody>
</table>
relatively small number of students at any one time. That is, they were primarily engaged 
with the same activities at the same time.

*Changed practices with Second Life.* When looking at the practices occurring 
*during* the Second Life units, there is a drastic change in the way the teacher is spending 
her time. The teacher is ‘teaching’ or presenting much less and helping less students. She 
is rather spending more time with each interaction with students, providing a longer time 
of help or of discussion/interaction about the students work.

As the teacher is engaged with her typical approach to ‘teaching’ to a much less degree, the students are thus learning from different places. They are spending more time 
both experimenting with the software and working in the software to complete tasks. 
Though the teacher is not using the software more, the students are utilizing the tools of 
the software to interact with those inside and outside of the classroom. The students also 
began to get help from one another to a much greater degree. As the time went on, not 
only did the amount of teacher help decrease, from 65 requests to 44, but who they 
received the help from expanded to include other students, within and outside the 
classroom.

*Examination of change to interactional practices over time in Second Life.* The 
important changes to student and teacher practice that occurred from before to during the 
use of Second Life was not an immediate change when Second Life was dropped in the 
classroom. Rather, there was a shifting of interaction across the time of the units. In table 
5.4, I have outlined three different types of interactions (student to student, teacher to 
student, and student to teacher) within four different categories of interaction.
Changing Classroom Social Space

Table 5.4. Chart of participant interactions overtime

<table>
<thead>
<tr>
<th></th>
<th>Verbal interactions with the whole group in class*</th>
<th>Verbal interactions with individual in class*</th>
<th>Interactions in Second Life**</th>
<th>Moving in Classroom*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student to Student</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 2-3</td>
<td>32.5</td>
<td>63.5</td>
<td>3.5</td>
<td>10.5</td>
</tr>
<tr>
<td>Day 4-7</td>
<td>55</td>
<td>120.3</td>
<td>9.0</td>
<td>24</td>
</tr>
<tr>
<td>Day 8-9</td>
<td>40.5</td>
<td>115</td>
<td>10.2</td>
<td>16.5</td>
</tr>
<tr>
<td>Unit 4</td>
<td>57.5</td>
<td>99.5</td>
<td>11.2</td>
<td>10.5</td>
</tr>
<tr>
<td><strong>Teacher to Student</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 2-3</td>
<td>50</td>
<td>48</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>Day 4-7</td>
<td>38</td>
<td>53.25</td>
<td>2.75</td>
<td></td>
</tr>
<tr>
<td>Day 8-9</td>
<td>40</td>
<td>31</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Unit 4</td>
<td>21</td>
<td>18.5</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td><strong>Student to Teacher Requests for Help</strong></td>
<td>To Teacher In class*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 2-3</td>
<td>38</td>
<td>64.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 4-7</td>
<td>33.5</td>
<td>43.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 8-9</td>
<td>17.5</td>
<td>29.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit 4</td>
<td>13.5</td>
<td>12.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* averaged by number of days
** averaged by number of days and number of students interacting

The shift from teacher- to student-focused activities can be seen by examining the activities the students were engaged in and, with whom, and who were the interactants. I have differentiated those times when the interactions were with the class as a group, such as shouting out something to everyone or giving directions to the whole class versus those made to just one other individual to clearly show how there was a shift from whole group interactions to individual interactions. I identified the movement in the classroom, as there was a dramatic increase in the amount of time students were up and out of their seats interacting with others. These students who moved about the room provided help and support to other students in the class. Originally only two students, this number increased to be five students by the end of the units related to Second Life.
Overall, I found that the changes to practice were: 1) a decrease in the amount of time the teacher stood in front of the students ‘teaching,’ 2) an increase in the amount of time the teacher spent one on one with students, 3) an increase in the ways that the students learned skills in the classroom, 4) an increase in the amount of interaction with others by both students and teacher, 5) a reduction in the requests for support from the teacher by the students, 6) an increase in the amount of redirections by the teacher, 7) an increase in the ways the students interacted with others, 8) an increase in time spent using the software for non-assignment related items.

**Aligning the changes in practice to the changes to space.** In this section, I align the changes in practices with the changes in the space to show how the changes in space and spatial resources were taken up as the practices changed. In the following Table 5.5, I have aligned the changes in space/resources and the changes in practices that I found taking up that specific change in space. It is important to note that I am not suggesting that the changes to the space *caused* these changes in practice, nor am I suggesting that the practices that emerged were the only ones that were supported in this change in space. The changes to the space and resources made different opportunities more available for the participants from which to draw on when living /negotiating/developing out practices.

<table>
<thead>
<tr>
<th>Change in Space</th>
<th>Change in Practices</th>
</tr>
</thead>
</table>
| A. Expansion of the interactional space, | *Multi-directional interactions*  
|                                  | 1) a decrease in the amount of time the teacher stood in front of the students ‘teaching’  
|                                  | 2) an increase in the amount of time the teacher spent one on one with students  
|                                  | 4) an increase in the amount of interaction with others by both students and teacher |
| B. Increased access to spatial resources | *Diffusion of learning and expertise*  
|                                  | 3) an increase in the ways that the students learned *required* skills in the classroom, |
4) an increase in the amount of interaction with others by students
5) a reduction in the requests for support from the teacher by the students,
7) an increase in the ways the students interacted with others,

C. Open control of the online, interactional space.

<table>
<thead>
<tr>
<th>Student participation and development of practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>3) an increase in the ways that the students learned additional skills in the classroom,</td>
</tr>
<tr>
<td>6) an increase in the amount of redirections by the teacher,</td>
</tr>
<tr>
<td>8) an increase in time spent using the software for non-assignment related items.</td>
</tr>
</tbody>
</table>

Table 5.5. Alignment of Changes in Space With Changes to Practice

**Expansion of the interactional space supported Multi-directional/De-centered interactions.** This first alignment of changes in space and changes in practice looks at the de-centered or multi-directionality of interactions that took up the expansion of interactional space in the classroom (row 1 of Table 5.5). It was how the changes in space were taken up that supported these changes in practice, not simply the change in space. These same changes could have seen an individualization of the interactions with students focusing on the screens of the iTouches and computer. Instead the majority of interactions were no longer taking place between the front of the room with the teacher and the students in their seats. The space had been created to allow for interactions to take place between teacher and students as a group but also, from teacher to one student or from student to student. The expansion of the space, allows for interactions to occur between multiple individuals, taking up the increased space available for interaction to occur.

As the space was decentered, so were the interactions. The teacher’s practice became more intensive in support of individual students and less centralized on her, as can be seen through the increase of time the teacher spent looking at student work. Although the number of teacher to student interactions decreased, the amount of time she
spent working with students and their work increased. This suggests a more focused and longer time with students seeking help or support. Students did not lack for support, however. There was an increase in the interactions between students.

Even when presenting, a more centralized practice, she was not able to see the entire classroom at once. Rather, she had to move around the classroom to view what the students were doing. The students’ computers were located right next to each other and so it was just as easy, if not easier, for students to glance at a classmates computer as up to the wall where the teacher computer was being projected. This both physically decentralized the teacher, and visually decentralized her computer. The teacher noted this situation both when she said, “I don’t like the lab. I can’t be sure that the students are paying attention when I am trying to present something” (Teacher reflection, 10/13/2009). She felt so decentralized by the end of the first unit that on Day 9, she used a program in the computer lab to lock the students’ computers until she was done presenting.

The types of student’s interactional practices increased through the use of the changed and expanded space, to more frequently included those sitting near them, but to also interact in the online space with others in and outside of the room. Students were no longer focused on interactions solely with the teacher, but frequently had interactions with multiple individuals on multiple topics with multiple tools to interact.

*Increased access to spatial resources was taken up through a diffusion of learning and expertise.* The second alignment recognizes the increased access that students had to learning resources including each other and how that increased access
supported multiple approaches to learning and the development of individual expertise. The tools for interaction were taken up to allow multiple forms and formats of interaction leading to learning and development of expertise. Students had access to the iTouches and the Internet to self-teach, but more importantly, they had access to a wide variety of tools within Second Life to learn from each other and develop expertise in specific areas. This resulted in a decrease in requests for help from the teacher and an increase in support from one another. As the spaces became multiple and access to the interactional tools increased, the students began to learn from multiple locations. Although the teacher was still a source of the information, she became one source of many.

The teacher made the ongoing use of the computers and Second Life not only an acceptable behavior, but also an expected one by providing immediate and readily available access to the computers and Second Life. Additionally, the teacher’s continual redirection to the iTouch as a source for how to do something and in so doing, away from her, sanctioned the use of ‘other experts.’ This sanctioning combined with the multiple methods of communication and continuous access to these methods, provided the students with the opportunity and encouragement to develop their own network of expertise. This meant that not only was the information no longer dependent on the teacher, but the order of learning was no longer dependent on the lesson plan, instead learning was much more driven by the needs and desires of the students in the moment.

With the expansion to the online space, this change also opened up interactions with other people from outside of the classroom. There were three distinct occasions when students mentioned learning a single skill from someone else, and one student had
ongoing interaction both during the class and outside of the class with a small group from outside the class that supported his learning the higher skills in Second Life of building objects in the 3D interface.

*Control of the online, interactional space was taken up through student participation in and development of hybridized practices.* The students’ practices also expanded and shifted. However, their practices ‘got things done’ in not only an expanded way but also in changed form. Through taking up the changed resources of the space and location, they didn’t merely exchange one form with another. Rather, through the tools, the practices were hybridized. This hybridization can be seen by looking at the ways students addressed the same needs (e.g. communication with peers) utilizing the new tools and resources of the space (e.g. online versus yelling). Some common practices that demonstrate this and were in evidence by the end of the first unit and in unit four were:

- For a student to shout across the room to another student, telling them to look online at a specific location.
- For a student to lean over or move across the room after trying to help someone or communicate online to complete the conversation.
- To see a group laugh and start talking to each other in the class about something that was just said or done in-world.
- When a student asks another student for help in completing the assignment, in the process of providing help, they learn how to do a common action more efficiently.

In this way, the interactions became more fluid across interactional locations and methods. Although the teacher remained primarily focused on interactions in the physical
space, the students began to help each other, share “fun” locations, or have conversations in a fluid manner, reducing if not removing the boundaries between online/offline. I will further demonstrate this hybridization of practice through an illuminating example from one day during the first Second Life Unit. This example took place during the class period when the students were asked to follow specific directions and take a picture of themselves at that location (Day 6). In table 5.6 below, I have outlined each action taken and have followed it with the practices, and space or interactional tools identified.

<table>
<thead>
<tr>
<th>Sequence of Observed Actions</th>
<th>Practice(s)</th>
<th>Space/Interactional Tools Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When looking for the assigned location for taking the picture, a student, Francis, finds a graveyard and explores. Francis sends an IM to a friend, Gabriela, who sits on the other side of the room.</td>
<td>Completing assignment, experimenting with software, interacting with other students</td>
<td>Second Life, Instant Messaging</td>
</tr>
<tr>
<td>2. Gabriela shows the student next to her, Natalia.</td>
<td>Interacting with other students</td>
<td>Second Life, Talking</td>
</tr>
<tr>
<td>3. Natalia offers a teleport to a Kevin on a different side of the room. Kevin accepts the teleport and then walks back to the back of the room to talk to Natalia about it.</td>
<td>Interacting with other students</td>
<td>Second Life, Teleporting, Moving in classroom</td>
</tr>
<tr>
<td>4. When Kevin gets up to move, Fernando, his seatmate, also goes to see.</td>
<td>Exploring software</td>
<td>Proximity in classroom, Moving in classroom</td>
</tr>
<tr>
<td>5. Once Fernando sees the locations, he asks the original student, Francis, to teleport him to the graveyard.</td>
<td>Interacting with other students</td>
<td>Second Life, Talking in classroom</td>
</tr>
<tr>
<td>6. Francis doesn’t know how to offer a teleport and so asks Fernando to show him how. Francis then offers the teleport to Fernando.</td>
<td>Learning to use software, Offering/receiving help from others</td>
<td>Second Life, Teleporting, Talking</td>
</tr>
<tr>
<td>7. Fernando accepts and when he disappears from the location where he was supposed to be taking a picture, his partner, Carla, shouts across the room, asking where he went.</td>
<td>Exploring Software</td>
<td>Second Life, Shouting across room</td>
</tr>
<tr>
<td>8. Fernando offers a teleport to her. She shouts across the room again, asking what it is for. Fernando IM’s her the answer and she teleports.</td>
<td>Interacting with other students, completing assignment</td>
<td>Second Life, Shouting across room, IM, Teleporting</td>
</tr>
<tr>
<td>9. The teacher noticed the conversation across the room between Fernando and Carla. She goes to Carla’s computer, the closer, and asks what she is doing. Carla responds “I don’t know, Fernando brought me here.”</td>
<td>Looking at students computer, interacting with student</td>
<td>Walking in classroom, talking</td>
</tr>
</tbody>
</table>
Table 5.6. Finding the Graveyard. An example of hybridizing classroom and online forms of participation and communication that both challenged and complemented accepted power structures.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Teacher shouts out across the room: “Fernando, what are you doing?”</td>
<td>Interacting with students, redirecting</td>
<td>Shouting across room</td>
</tr>
<tr>
<td>11. Fernando responds: Francis found a graveyard.</td>
<td>Responding to teacher</td>
<td>Shouting across classroom</td>
</tr>
<tr>
<td>12. Teacher walks over to Francis’s computer and looks over his shoulder.</td>
<td>Looking at students computer, interacting with student</td>
<td>Walking in classroom, talking</td>
</tr>
<tr>
<td>13. The teacher then speaks to the whole class: “Ok everyone, Francis has found a graveyard. This is nice. No other class has found a graveyard. If you want to use another location for your picture, you have to ask me first.”</td>
<td>Redirecting</td>
<td>Shouting to classroom</td>
</tr>
</tbody>
</table>

The students’ ability to control the online space meant that they not only adopted practices of interaction and use of the space as provided by the teacher, but they also hybridized their practices across these spaces in tools. With the increased access to spatial resources, students became more active in their participation and development of the practices in the space. Students actively choose how to learn and complete aspects of the assignment. They frequently pursued their own interests or satisfied their own curiosity about aspects of the online space as the teacher was working with other students and not directing the work from the front. The development of practices was diffused amongst all the participants rather than directed strongly by the teacher.

The practices picked up in the online world did not remain there either. There is an interesting parallel to the way in which the students expanded in their online interactions and support of one another and then increased the interaction through both shouting across the room and physically moving about the room. When looked at a day-by-day flow, one can see the increase in interaction paralleling the student’s development of expertise with the skills and interactional methods. The changes to the physical classroom facilitated greater amounts of interaction of the students at their seats but also
supported the movement around the classroom itself physically. Thus the take up of more in-class interaction was shaped by the changes to the space but also shaped by the changes in practice that had developed through the online space changes.

**Summary of Finding 1.** As outlined in my theoretical framework (detailed in Chapter Three), the resources and space of a specific social space make certain practices more available to those in the social space. I suggest that these resources and spatial components provide a pressure on the practices in the interactional space. This pressure does not dictate the practices that emerge and develop, but rather provides support for reshaping practices in a certain way. The three areas of pressure that I identified within these specific changes to resources and space were expansion of the interactional space, increased access to spatial resources, and open control of the online, interactional space. These spatial changes were significant changes that occurred in the units with Second Life. I have made the case that *given time to develop; the changes in the availability, accessibility, and control over the resources of the space supported the seven shifts in practice* identified in this section. These practices made use of these changes in space and resources, even hybridizing its use, in some ways, changing shape to match the space provided as water poured from one container into another. However, unlike water, the participants are individuals with choice and intent. Their movement to these forms of practice was not merely a result of the space being changed, but rather there was purpose and negotiation for their take up of this space in this way and the practices that developed from this take-up. This intentionality and negotiation is what I address in the next finding as I examine the influence of design on practice change.
Research Finding 2: As students creatively took up practices, the teacher’s revised design diverged from both the original desired outcomes of the teacher and the new student practices.

Research Question #2: In what ways does the teacher’s design for the use of Second Life influence the trajectories of practice in her room?

Introduction. Social practices and social spaces have historical elements, and it is the repeated or ongoing availability (or lack) to specific spatial or interactional resources that define those social practices most likely to emerge. These social practices then build the social space thus further restricting or support specific social practices. With this in mind I look at what social practices were restricted or made available more fully during the use of Second Life in that classroom. By tracking the social practices that emerged and connecting them with the design of the teacher, both the intended design as well as that which was implemented, I am able to see those elements emerged as part of the changes made by the teacher. Some of these were made more available through the design work of the teacher, and other social practices emerged utilizing Second Life that were either not designed or more importantly were attempted to be designed out by the teacher.

Design influenced practices and practice influenced design. When examining the relationship between design and practice, there is not a uni-directional cause and effect. Rather that influence of design on practice is complicated by the fact that design is not a single, set action or series of actions done in isolation, nor is practice simply a result of design as played out by participants. Rather design is lived through practice, and
practices take up (or don’t) the design in different ways. Thus, I will define the way that
design influenced practices and then will explain how the changing practices within and
outside of the classroom influenced the design.

**Design influenced practice.** Design, as a social practice, does indeed influence
other practices in the social space. As such, it is not surprising that I found that design
influenced practices. How this influence took place and the ways that design was also
influenced by practice is the more interesting story I will tell. I found that the design of
the teacher influenced practices but frequently not in the expected or planned for manner.
In this section, I will first describe the overarching design intent for the use of Second
Life itself. I will then describe the designed instructional strategies used by the teacher
and their impact on the practices in the room.

**Overarching design of Second Life.** I sought to understand the teacher’s goals for
the use of Second Life. At times she stated these to me. At other times during our
planning sessions and reflections, I asked the teacher why she made the decisions she did.
I identified 89 different comments that Ms. Savvin made explaining her reasons for using
Second Life. I was able to conduct a content analysis of these 89 comments and identified
7 desired outcomes with the corresponding, prevalent approach she was intending to use
listed in Table 5.7.

<table>
<thead>
<tr>
<th>Intended Outcomes (when completed, these are the benefits that would be realized)</th>
<th>Through (anticipated method of design)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Expanded experiences for students</td>
<td>Interacting with others in and out of schools</td>
</tr>
<tr>
<td>2 Practice of English language skills</td>
<td>Using, building and creating objects</td>
</tr>
<tr>
<td>3 Development of technical expertise</td>
<td>Building and creating objects and use of avatars</td>
</tr>
<tr>
<td>4 Participation/contribution in the online space</td>
<td></td>
</tr>
<tr>
<td>5 Student self-expression</td>
<td></td>
</tr>
</tbody>
</table>
6 Taking on different points of view  Use of avatars and role-play
7 \textbf{Experiences outside of the students normal/closed lives}  \textbf{Interactions with a 3-D virtual world}

Table 5.7. Teacher’s stated desired outcomes and means to achieve these outcomes at the onset of the project.

These initial desired outcomes provided directionality for her planning. These desired outcomes, though stated, were not explicitly identified as the actual goals for the use of Second Life in her classroom. These were her ‘why’ and ‘how’ during her initial planning sessions prior to meeting her students or starting the school year and the development of the social space for that classroom.

Further analysis of the teacher’s planning showed that there were 1) items that the teacher felt were an important part of the unit and 2) other items that the teacher hoped to see in her unit. I identified the level of importance through her own words “I really want to see this happen”, the number of times she mentioned these items, the passion with which she discussed these items, or that she said that they were essential or required for the course (learning English). Those items in bold in the above chart relate to those items she “knew” she needed to plan for. The items not in bold were item’s she hoped to see. These second items were identified when she stated them in terms such as “it would be nice if they could” or “I wish that they would” or “I hope we are able to.”

\textit{Designed instructional strategies.} From these initial, hoped for outcomes and anticipated methods of design, the teacher developed specific approaches in an attempt to meet these desired outcomes. I have defined a designed instructional strategy as any purposeful, wide-ranging change implemented by the teacher to support progression towards a desired outcome or goal. Although there were many smaller design decisions, a strategy is a wide-ranging change and of these types of changes, I found only 4 that were
implemented by Ms. Savvin: 1) change of the class location by using the computer lab, 2) new teaching approaches, 3) providing iTouches, and 4) specific skill(s) focus for each day. I will discuss these four designed instructional strategies, the desired outcome as identified by Ms. Savvin, and then how the design was taken up in the classroom.

**Design instructional strategy: Use of computer lab.** The teacher’s stated intent for the use of the computer lab was to ensure that Second Life didn’t run too slowly for the students. Ms. Savvin told me that “We need to use the computer lab because the laptops are just too slow on the WiFi connection. The computers in the computer lab are faster too. I just wish that I hadn’t taken my rights away on them” (Planning session, 9/17/09). She did design in time during the Units when they would not be in the lab. Additionally, her originally design was to start class in the classroom to allow discussion and teaching first. The logistics of moving the students in the first day however, had her redesign this item.

**Take-up of the design.** This small design decision that was in actuality made only due to the location of the technology, resulted in many of the spatial changes mentioned in Finding 1. In Finding 1, I describe not an impact of design but rather how the students took up the spatial changes that came from moving to the lab. The teacher was not attempting to decenter the classroom, provide more convenient access to other students, nor even to ensure that the students had immediate and ongoing access to the computers throughout each and every class period. Rather, these were all side-products of her actual design decision to move to the computer lab so that students would have reliable connection to Second Life on the faster computers. As such, the take-up of the actual
design strategy to create reliable access was almost unnoticed by the students as it merely removed a potential barrier to success with the teacher’s lessons. The take-up of these side-effects was of much greater interest and influence in the classroom as already discussed in Finding 1. This impact of the spatial choices she made, that was unintentional actual had one of the more enduring effects through the students’ take-up of the practices that this change made more available.

*Design instructional strategy: Changed teaching methods.* The teacher changed her approach to teaching during her introductory unit to Second Life. This was an intentional change based on multiple comments she made throughout the planning and reflections sessions:

- “I am trying some new approaches,” (Teacher planning, 10/16/09)
- “I am going to try some of the ideas you [the researcher] had suggested,”
  
  (Teacher planning, 9/17/09)
- “I am going to run this unit different than others I do,” (9/17/09)
- “I think maybe I had too many new ways of doing things for the students”
  
  (10/19/09).

When I asked what new approaches she was using, she identified two differences: 1) she wanted the students to use their English skills to follow directions without her having to stand up and walk them through each part and 2) she wanted to have the students focused on specific tasks that they had to complete so they could show her they really knew how to use Second Life.
In order to identify how she brought these desired changes into actual instructional changes, I analyzed her structure of lessons and activities before the unit and then during the unit. I found that she used a few methods that did, as seen in Finding 1, decrease her time in-front of the students ‘teaching.’ Below I outline her regular approach to units and then those observed during the Second Life Units.

Structure at the start of the unit: Part of the classroom social space is the historical social practice of a ‘lesson’ for a particular classroom community. School practice typically defines the teacher as the designer of the actual activities that students will do during the specific time they are in that space. Different teachers have implemented this practice in different ways. The teacher in this study had a typical structure for the lessons she taught. This structure was defined by not only observation but also the discussions with both teacher and students prior to starting the Second Life unit when I inquired ‘what do you usually do in class?’ and ‘how do you learn in this class?’ Recognizing that a teacher is creative and may deviate from a standard practice, this is none-the-less what emerged as her ‘way of doing’ teaching. Units were typically focused on learning and using a specific software application. As her program was an English as Second Language program, she also discussed embedding the teaching of English in two ways. One was that she provided supplemental support tools and instruction for the students to learn the content of the course. Her primary example of this was that of teaching the vocabulary ahead of time. The second way she embedded the ESOL support was through providing tasks and assignments that were not as complex and providing more time for the students to complete these tasks.
The units lasted between two to four weeks and followed this basic sequence of activities:

1. One to three days: Overview of the software with vocabulary handout.
2. Three to five days: Model and walkthrough of basic features. Students complete the exact same task together using the same template.
3. Four to seven days: Demonstration and walkthrough of advanced features. Students then have a project to complete using a standard template. Teacher helps students who were absent.
4. One to two days: The assessment for units was either the finished product that was displayed during class, with vocabulary quizzes during the unit or a combination of vocabulary and skill demonstration on a final exam.

The three units prior to the Second Life unit starting, Introduction to the Laptop, Microsoft Word, and Email, followed this pattern.

*Teaching practice(s) seen during the unit.* Through analysis of the video recorded class sessions, I was able to identify the ways that the teacher ‘got things done’ in regards to ‘teaching’ during the introductory unit of Second Life. The teaching to the students, as defined by both the teacher and the students, was the time when she would provide information or demonstration for the whole class. Using her ‘typical approach’ as a model, I was able to examine the extent to which her structures shifted during the Second Life unit.

*Continuation of previous practices.* Some of the observed teacher practices with Second Life were typical of practice in the classroom prior to Second Life. Though they
had a different topic, the space was different and the students had access to different resources, the following teaching practices of the teacher were the same.

- **Teacher Walk-through with accompanying worksheet (3 days):** The teacher still provided a walkthrough of some of the critical aspects of the program (logging in, movement, chatting, changing of appearance) and more difficult processes (organizing inventory). In these instances, she provided worksheets with the directions on them rather than vocabulary to enter or steps to write down. This occurred on *days 2, 3, and 8* and was a typical practice for her.

- **Teacher demonstrations prior to student practice/activity (4 days):** She conducted demonstrations for the students on days 2, 4, 6, and 9 of the first unit prior to directing them to either a practice or an activity. During *days 2 and 9 she did not allow the students to log in until after* she had conducted a demonstration with explanation of the concept and steps for proceeding through certain aspects of the program. This was also a typical practice for the classroom.

  *Changed/new practices:* The teacher did develop a new practice for teaching the students during the Second Life unit. That is, how she provided information to the students was different. I will address the actual use of the iTouches and structure of the activities in more detail later. This particular practice is in regards to how the teacher herself presented the lesson supports for the whole class.

- **Initial, brief directions or demonstration with activity information and how-to’s on sheets and iTouches (7 days):** On days 4, 5, 6, 7, and 9 of the introductory unit *and both days* of the follow-up unit (Unit 4), the teacher provided directions and
the iTouches with a slideshow for all of the directions for all the major functions needed in Second Life. She opened each of these days (save day 9) with simple directions and then instructed the students to refer to the handout/iTouch for the task for that day.

**Shift in practice: In class Teacher Redirection:** The practice of redirecting students became a teaching method used during the times when the students were working on their own to ensure that they remain focused on the activity and demonstration of the specific skills needed to complete the activity for that day. This was not a new approach, but was something used with increasing frequency during the first Unit as can be seen in Table 5.8.

<table>
<thead>
<tr>
<th>Day</th>
<th>Look up here</th>
<th>Look at handout/iTouch</th>
<th>Stop non-related Second Life activity</th>
<th><strong>Total redirects</strong></th>
<th>Ask classmate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>23</td>
<td>NA</td>
<td>NA</td>
<td>23</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>18</td>
<td>14</td>
<td>9</td>
<td>41</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>12</td>
<td>18</td>
<td>51</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>17</td>
<td>19</td>
<td>17</td>
<td>53</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
<td>16</td>
<td>22</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>13</td>
<td>29</td>
<td>24</td>
<td>66</td>
<td>0</td>
</tr>
<tr>
<td>7**</td>
<td>5</td>
<td>8</td>
<td>5</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>22</td>
<td>15</td>
<td>16</td>
<td>53</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>16</td>
<td>17</td>
<td>12</td>
<td>45</td>
<td>2</td>
</tr>
<tr>
<td>10*</td>
<td>12</td>
<td>14</td>
<td>NA</td>
<td>26</td>
<td>8</td>
</tr>
<tr>
<td>U4D1</td>
<td>14</td>
<td>19</td>
<td>9</td>
<td>42</td>
<td>2</td>
</tr>
<tr>
<td>U4D2</td>
<td>7</td>
<td>16</td>
<td>6</td>
<td>29</td>
<td>3</td>
</tr>
</tbody>
</table>

* In classroom day, not in Second Life
** Select own activity day

**Table 5.8. Types of teacher redirection in unit one and unit 4**

The redirections primarily took on four types. “Look up here,” was a call to attention for Ms. Savvin. She would use this to stop the current activities and give the
whole class a redirection. The majority of statements made to the whole class by Ms. Savvin in three class periods were redirections (Days 4, 5 and 6). A second type was seen when she was asked for help or direction, Ms. Savvin would often tell them to look at their handout or iTouch. On Day 6, she made this statement 29 times. A third redirection was simply to tell the students to stop Second Life activities that were not related to the completion of the assignment. The in-world activities that were at times said to be unrelated to the lesson activity were: chatting with other students, changing appearance/clothing, playing with inventory, running into each other on purpose, driving, teleporting each other to other location, IM’ing with students, flying around, playing with tools on screen not taught by teacher, building/creating objects on own, providing help to others, and talking with people who were not from within the class. Typically the teacher would tell the students that they could conduct those activities after they had completed the worksheet.

*How design was taken up:* The students practice did take up the teacher’s approach. In fact, as evidenced by the frequency of questions and interactions with the teacher from Table 5.4 in Finding 1, those lessons or portions of lesson that were more centralized, saw more questions of the teacher. For example, on Day 8, a much more structured day with traditional practices, the students asked for help more from the teacher than they had on any of the previous three days. The redirections were also one of the highest for the unit on this day.

Most revealing were the days that had both teaching practices in evidence. On these days, the more centralized practices and focus on the teacher occurred immediately
following the walkthrough and demonstration. For example on day 6, during the
walkthrough in the first 12 minutes of the class, nearly all questions of the teacher were
asked for the period. After the initial centralized approach, only four more questions were
asked of the teacher whereas there were over 60 requests for help to other students in that
same time period.

*Alternate take-up of lesson design:* Within the design for the activities was an
unplanned aspect of design that was taken up by the students. Her design decisions in
regards to the activities themselves also influenced the practice take-up through the
structuring of the time within the classroom. Ms. Savvin desired to create only one lesson
plan and set of resources for each class period, whether this was beginning students or
intermediate students. By having activities that both her beginning and intermediate
students could complete, the intermediate students typically completed the assignments
within the first half of class. The students were then allowed free choice time as long as
they were in the Second Life world. Ms. Savvin recognized the benefit for this
exploration time and even developed one lesson in which the students had nearly the
entire class period to choose what to do in the Second Life. This change in structure of
time was significant in that the students previously were provided with specific templates
to complete rather than the more open options for choice. Although the teacher did not
purposefully design towards providing students with a large amount of time to
experiment on their own during every class period, she did recognize this as something
that the intermediate students would have and acknowledged it as beneficial.
Design instructional strategy—use of iTouches. As a part of the planning and design, the teacher and I discussed ways to provide resources to support the students in completing their tasks. The teacher had concern that the students would not be able to complete the tasks without direct instruction on the skills needed to complete the assignment. Below is the conversation with me (R) when the teacher (T) agreed to try a different approach with the use of the iTouches (Teacher planning, 10/11/09).

T: I like the idea of each day they have something they have to do. I just think that, with the language issues…
R: Right… I do think that the students could handle it. Maybe if we just showed them.
T: I could start each lesson where I show them how to do what they need to do for that day.
R: That might work… But if we want them to be more independent.
T: Ok. I could write the instructions on a worksheet. They could then fill in the vocabulary I teach them and then follow the instructions.
R: What about this. I have access to a set of iTouches. We could put the instructions on them and then the students could use them anytime they need them.
T: Oooh… I like that idea. I like that idea very much. Are you sure you can have the iPod Touches for us to use? [R nods head] Then they could watch it as many times as they want and they wouldn’t have to always ask. But that would mean we would have to sync them with the new directions each day.
R: Actually, I was thinking that we could just put all the directions and step-by-step on them. This way they can always go back and look if they need to.
T: What if they look ahead.
R: I guess I don’t see any problems with that. As long as they have what they need to do for that day, if they go ahead, good for them.
T: Well, I doubt any of them will do more than they have to.
R: But if they are inspired, then it is still there for them.
T: [Laughs] True. Then if I give you the directions I would say, you will put those on the iPod Touches?
R: I was thinking of doing a screen by screen with directions written on it.
T: OK. The kids will like that. They don’t have to listen to me now. The iPod Touches will be me.
R: Hmmm… so 14 little you’s all over the room. [Both laugh].
[Discussion of the exact format of the directions and the list of directions needed followed]
T: OK. So you are going to put these directions on the iPod Touches. I will give them out and explain how they can use them. If they don’t know how to do something, they can just look on the iPod Touches. They will have to be reminded. But this will let them feel they can do this even with the language issues, since it will be pictures. Or they can ask one of us to explain it to them. I think we should have someone from district office come and see this.

As can be seen in this dialogue, the iTouches were initially a tool for support. Through our conversation, the use of the iTouches became a strategy on its own. For the teacher, the strategy had the potential outcome of providing greater independence and making the directions more accessible to the students. She saw the iTouches as a means to provide what she would normally do for each student including personal pacing and repeated exposure when she/he needed.

*Take-up of this design:* For the teacher, the tool became a proxy for the teacher and her teaching. When I asked her what changes she had made to the way she provided help to students, she said,

I usually just show them on the SmartBoard or show them on their computer when they ask for help. Their language is a problem to just explain so sometimes I have them write down the directions. Now I gave them iPod Touches and it has directions for them in English and Spanish with the pictures. They can do it on their own. They can go back and remember. *They have the teacher right there for them, in their hands* [emphasis added] (Transcript of session debrief/reflection, 10/16/09).

The first day she provided the iTouches to the students, she actually walked through what each screen said and had the students complete the directions all together at the same time. She also did this on Day 8. During the day, she referenced the iTouches when
students had questions, redirecting them to this tool close to 35 times on one day (an average of 28 times per day on Days 3-6). She redirected the students from not only off-task activities but even when other students were trying to help them. “Kevin, she does not need your help. She has an iPod Touch. You should sit down and look at yours too.” (Classroom Observation Transcript, 10/20/2009).

The students utilized the iTouches when directed on the days listed above. Three students walked through every tutorial on the iTouch on the first day. One male student, Ricardo, quickly discovered that by shaking the iTouch, the screen will advance to the next slide. He showed other students how to do this small item that the teacher didn’t know about. When she had him show her and congratulated him on showing her something she didn’t know, the student responded: “Ms. You mean I taught you something? Who’s the teacher now?” Ms Savvin responded, “I am still the teacher and you are my lovely, lovely and smart student” (Classroom recording, 10/16/09). Overall, the students attempted to use the iTouches only in the first two days. Though the teacher thought of the tool as a proxy for the teacher, the majority of students quickly found other resources to use as a replacement.

*Design instructional strategy: Daily focus on specific skills to learn.* During her planning time in September, Ms. Savvin identified that she was concerned with the focus of this year’s students. As such, she wanted to have the students working on specific skills on each day and not just a task that they are to complete. She developed the progression of needed skills for the students and plotted those across the days in Second Life for the Introductory Unit. Her stated goal for this was to “be sure that the students
were actually staying focused and learning the basic movements and how to use Second Life” (Planning time, 9/19/2009). She ensured this would happen by having those skills be needed in the task the students had to perform on each day. The first two columns of Table 5.9 below shows Ms. Savvin’s strategy of each day having specific skill(s) for the students to focus on.

<table>
<thead>
<tr>
<th>Second Life Skills</th>
<th>Introduced by teacher</th>
<th>First emergence</th>
<th>Majority of students have done</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>Day 2 (9)</td>
<td>Day 2</td>
<td>Day 2</td>
</tr>
<tr>
<td>Chatting</td>
<td>Day 2 (9)</td>
<td>Day 2</td>
<td>Day 2</td>
</tr>
<tr>
<td>Friending</td>
<td>Day 2 (9)</td>
<td>Day 2</td>
<td>Day 5 (22)</td>
</tr>
<tr>
<td>Changing appearance</td>
<td>Day 3 (18)</td>
<td>Day 2 (9)</td>
<td>Day 2 (9)</td>
</tr>
<tr>
<td>Accepting teleport</td>
<td>Day 3 (18)</td>
<td>Day 3</td>
<td>Day 3</td>
</tr>
<tr>
<td>Using/Changing clothes</td>
<td>Day 4 (17)</td>
<td>Day 3 (18)</td>
<td>Day 3 (18)</td>
</tr>
<tr>
<td>Using inventory items</td>
<td>Day 4 (17)</td>
<td>Day 3 (18)</td>
<td>Day 3 (18)</td>
</tr>
<tr>
<td>IM’ing</td>
<td>Day 5 (22)</td>
<td>Day 2 (9)</td>
<td>Day 3 (18)</td>
</tr>
<tr>
<td>Taking items into inventory</td>
<td>Day 5 (22)</td>
<td>Day 5</td>
<td>Day 5</td>
</tr>
<tr>
<td>Flying</td>
<td>Day 5 (22)</td>
<td>Day 2 (9)</td>
<td>Day 3 (18)</td>
</tr>
<tr>
<td>Student offering teleport</td>
<td>Day 6 (24)</td>
<td>Day 3 (18)</td>
<td>Day 5 (22)</td>
</tr>
<tr>
<td>Using the map</td>
<td>Day 6 (24)</td>
<td>Day 4 (17)</td>
<td>Day 7 (5)</td>
</tr>
<tr>
<td>Sending Pictures</td>
<td>Day 6 (24)</td>
<td>Day 6</td>
<td>Day 6</td>
</tr>
<tr>
<td>Organizing inventory</td>
<td>Day 6 (24)</td>
<td>Day 8</td>
<td>Day 8</td>
</tr>
<tr>
<td>Running</td>
<td>Day 8 (16)</td>
<td>Day 3 (18)</td>
<td>Day 3 (18)</td>
</tr>
<tr>
<td>Using Cars</td>
<td>Day 3 (18)</td>
<td>Day 3 (18)</td>
<td>Day 4 (17)</td>
</tr>
<tr>
<td>Group Im’ing</td>
<td>Day 4 (17)</td>
<td>Day 4 (17)</td>
<td>Day 4 (17)</td>
</tr>
<tr>
<td>Giving items</td>
<td>Day 5 (22)</td>
<td>Day 5 (22)</td>
<td>Day 5 (22)</td>
</tr>
<tr>
<td>Interacting with others not in class</td>
<td>Day 5 (22)</td>
<td>Day 5 (22)</td>
<td>Day 5 (22)</td>
</tr>
<tr>
<td>Changing day/night</td>
<td>Day 6 (24)</td>
<td>Day 6 (24)</td>
<td>Day 6 (24)</td>
</tr>
<tr>
<td>Redesigning Clothes</td>
<td>Day 6 (24)</td>
<td>Day 6 (24)</td>
<td>Day 7 (5)</td>
</tr>
<tr>
<td>Building items</td>
<td>Day 7 (5)</td>
<td>Day 7 (5)</td>
<td></td>
</tr>
<tr>
<td>Combining objects</td>
<td>Day 7 (5)</td>
<td>Day 7 (5)</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.9. Timeline for student completion of individual Second Life skills.
Student take-up: Skill acquisition done prior to teacher teaching. Though the teacher focused the first Unit on developing the skills to function in Second Life by having specific skill(s) each day, a different practice for learning skills emerged. The new pattern was that a few students would learn a new skill or find a new object or location and then would show it to others. The few, developing ‘experts’ learned these skills through exploration, using the iTouches, websites, learning from a student from another school, or occasionally asking the teacher or fellow-student.

I analyzed my observations within Second Life, the screen recordings from one student’s perspective, and the end of day quick notes on what they had learned that day that they did from Days 2-9. I used this information and mapped it against when the teacher introduced specific skills. Table 5.9 outlines the day the teacher first introduced a concept, when I first saw or a student reported using a skill and when a majority (at least eight) of the students had done this skill. I also identified whether the demonstration of this skill was conducted as part of completing the lesson or if it occurred outside of the requirements of the assigned tasks of the teacher. As can be seen, only six of the 15 skills that the teacher wanted to ensure they had learned were first enacted during the activities involved with completing the lesson.

This table exhibits the way that the students learned the skills and use of Second Life was not primarily through teacher instruction. Of the 15 skills the teacher wanted the students to learn as part of this project within the program, the majority of the students took up six as a result of the teacher’s lessons. The other nine skills, along with six additional skills were learned outside of the lesson. When I tracked each skill, I found
that those introduced by the teacher, six were exhibited by the majority of students on the day they were introduced, seven were exhibited by the majority of students prior to its introduction and the remaining two skills were actually picked up by the majority of students after they had been introduced by the teacher as part of the lesson. Ms. Savvin did also notice that the students were working outside of the planned lesson and skills. In parenthesis next to each day, I have listed the number of times the teacher redirected students for doing non-lesson related activities in Second Life. As can be seen, this number increased as time went on. On Day 7 and 8, we do see a dip in the number of redirects. On day 7 the teacher allowed free choice of activities and then on Day 8 the teacher had a controlled walk through of the lesson rather than allowing students to move at their own pace.

Though the teacher had planned to roll-out the various skills she considered essential to function in Second Life slowly over the unit with Day 7 being a day to reinforce and Day 9 being a day to provide final demonstration, the students picked up and demonstrated these skills much more quickly. By the end of Day 2, six of the desired 15 skills had already been demonstrated by at least 1 student and 3 had been demonstrated by the majority of students.

As this was over time, I plotted the skill take up over the lessons. What can be seen in the visual display is that there was a trend of individual student trying of skills, then other students trying the skills and then the teacher taught the skill. This interesting pattern suggests that the students were not learning from the teacher except the first day and then for a few, typically less essential or desired skills.
Summary of influence of design on practice. What I found in the analysis of the influence of the teacher design of instruction strategies on practice was that the teacher’s instructional strategies had inconsistent and sometimes unintended influences. The change of the teacher’s own practice in terms of moving from teaching to supporting the students as they learned had the most influence as intended. However, this strategy was inconsistently implemented as shown in the analysis of the daily plans. When she utilized lesson formats that allowed for greater self-direction, the students’ practices took-up those strategies to become more individually successful and mutually supportive. However, when her strategy was more centralized, the students’ practice resumed the more traditional interactional pattern with her.

In the case of the use of iTouches, the teacher envisioned these as proxy for her own teaching time. However, students did not take these up as intended. Rather a few students learned from them and then took on the role of the teacher for the other students. The students became the teachers and the iTouches were little used by the second half of the unit unless directed by the teacher. The use of the computer lab had the desired influence on practice, though it had more unintended influences, as seen in Finding 1. These influences on practice were not necessarily undesirable by the teacher, but were indeed unintended as part of her design strategy.

Another strategy that was not taken up as expected was that of having a focus skill(s) for each day. This strategy was meant to support the students in a less structured environment still attain the necessary skills. This strategy was not taken up as most students learned the skills ahead of time. The teacher ended up needing to redirect the
students more and more. Eventually, on Days 8 and 9, she actually adjusted her teaching approach to ensure they remained focused on the specific skills. These ongoing adjustments to her approaches along with both the rationale and reaction are what I address in my next section addressing changing design.

**Practice influenced design.** As I have already made the case in my theoretical framework and previous findings thus far, design is not an isolated event, detached from practice. Design is in fact a social practice of the space and both draws on the resources of the social space and also helps to construct that space. As such, I cannot merely discuss the influence of design on practice without also recognizing the influence of practice on design. In my study, the teacher’s design shifted significantly over the course of the 8 months we were engaged with design and implementation. This can be seen in the planning of the teacher and how it changes over time. The changing practices of the students and the teacher’s past practice both influenced a change in the teacher’s design away from her initial intent and desire towards a focus on learning or simply experiencing the software.

For this section of my finding, I will tell the story of the teacher’s changing design from initial conception through to the final decisions she made for the subsequent year. Utilizing interviews with the teacher, classroom observations, planning sessions and documents with the teacher and my own field notes, I have created the overall progression of design from the teacher’s point of view. This provides the context for examining the relationship between design and changing practice. For each step in this progression, I highlight the practices that impacted the decisions of the teacher. I am able
to make this connection through the teacher’s own words as she references these practices either on her own in the planning process or when prompted by me when she stated she was making a change to her plan.

*Ms. Savvin’s Story of Design.* I named this section with the teacher’s pseudo-name. This is to recognize that Ms. Savvin is a real teacher who walked through this data. She had passion for her work and students. Though I am critically analyzing the process of design and practice, I am not looking to be critical. She was, and continues to be, someone who tries to realize the possibilities of technology for reshaping education in her classroom in meaningful ways. She was thoughtful and considerate of her students while working within a system that brings its own restrictions for practice. She attempted to bring a new technology into her classroom when few others had been successful. There are still few classrooms that can be found in the research that have successful integrated this type of open technology as a meaningful aspect of their classroom. She was successful in that she exposed students to this technology and provided them with the opportunity to experience learning in a different type of environment, both online and also with the changed practices of her classroom. With this preamble in mind, I will present her story of changing design.

Ms. Savvin developed a full scope and sequence for the first unit that she termed the introduction unit. During this unit students would first enter the world, learn the skills and have opportunities to do some basic building and interacting with others. This decision on how to construct the unit was based on the project work conducted in the previous year.
Alignment of initial plan to teacher’s desired outcomes. Using her planning sheet, I aligned each of these topics to the desired outcomes in table Table 5.10. I was able to do this through the conversational procedure mentioned above whereby I would ask her why she was planning topics and activities and how she was planning to conduct those topics or activities. The first three columns in the table outline her plan as she had developed it in August, prior to the school year starting. The desired links listed in brackets are those that she did not explicitly identify in discussion, but that I saw alignment to in our conversations. As can be seen, the progression of activities moves from less involved to more involved, including more of the hoped for outcomes as the time continued.

Throughout the plan, she did specifically link through our discussion every desired outcome to at least one activity in her plan.

<table>
<thead>
<tr>
<th>Day</th>
<th>Initial plan</th>
<th>Desired Outcome Link*</th>
<th>Implemented Activity</th>
<th>Desired Outcome Link*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>Intro to Second Life presentation and outside person ‘visiting’</td>
<td>1, 2, 7 [3, 4, 5, 6]</td>
<td>Smartboard presentation where showed Second Life. Discussed the potential of Second Life in multiple areas.</td>
<td>7 [1, 2, 3, 4, 5, 6]</td>
</tr>
<tr>
<td>Day 2</td>
<td>Intro to Lab and walk/jump (handout on how to do this)</td>
<td>Tower- because easier then teleported out</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 3</td>
<td>Appearance</td>
<td>5</td>
<td>Changing Appearance- teacher walked through and let them change as they went</td>
<td>5</td>
</tr>
<tr>
<td>Day 4</td>
<td>Changing clothes</td>
<td>5, 6</td>
<td>First day of iPods with directions on them. Changing clothes [Realized in debrief that she has no grades for this first week]</td>
<td>5</td>
</tr>
<tr>
<td>Day 5</td>
<td>In classroom: demonstration/review and interviews</td>
<td>2, 5</td>
<td>Shopping at the mall- Worksheet to complete: Has students writing down the name of 3 stores, the name of 3 objects, answers 2 additional questions on the sheet (one a yes/no, the other to label 3 cars)</td>
<td>[2], 7</td>
</tr>
</tbody>
</table>
### Table 5.10. Initial VERSUS Implemented Activities

*Numbers representing desired outcomes, reference table 5.7

\[
\] represents outcomes with minimal alignment

As a part of the planning session, I also asked the teacher to define what her goals were for each unit and then for the overall project. This helped her to state explicitly the large-scale goals from her point of view. I defined what to count as “goals” with this explanation: “You will know you have done what you wanted to do when you see this.”

As can be seen in the chart, her goals for each unit were also progressive and supportive.
of the final Unit becoming a place for students to fully participate in the Second Life interactions as part of the classroom space. Her overall goal was for the students to participate fully with the Skoolaborate project. For her this meant: 1) “developing and running an activity in Second Life for others in the Skoolaborate project,” 2) “regularly interacting with those from other schools in English through Second Life,” and 3) using Second Life to think differently about their own learning and life (Teacher planning, 8/23/09).

*Student practices and take-up of typical teaching approaches influence a change to initial plan.* At the start of the school year, Ms. Savvin and I met to discuss the logistics for the first Unit and to develop any materials we needed for those days. During this time she explained that it was an interesting group this year. She expressed concern that not all of her students would be able to handle the complexity of language necessary to learn to build anything in the first weeks. She felt with the time that they had in the first unit, they would only be able to learn how to use the software for basic tasks. As she valued the interaction with other schools as a higher priority, she decided that they would not build during any of their units in Second Life but look for opportunities to interact.

She also felt strongly that language level should not dictate the depth of content in this first unit. As such, she wanted to plan each lesson so that the beginning level students could be successful. Her plan was to allow the older students more time to ‘play at the end after their work is done. Then they will be better with the skills’ (Teacher planning session, 9/17/2009). She did feel that the second time they returned to Second Life, only the intermediate students should do that unit. She felt that the high amount of interaction
required in Second Life with individuals from outside of the school would frustrate the beginning students and those from other schools. With this change to the larger picture, she refocused the work for the first unit on learning the skills and vocabulary necessary to function in Second Life. The intermediate students would have more time to practice these so that they would be ready for more in-depth interaction later in the year.

Once the school year started, she began to develop the lesson plans and activities for each day in more detail. The design and activities that she actually implemented into the classroom were only partially aligned to the desired outcomes and resembled the more typical unit design of learning a software than her desired participation in the project throughout the year. Looking at the original plan that Ms. Savvin had created for her use of Second Life in the classroom and the activity that was the final planned and implemented lesson can best illustrate these changes in design as seen in Table 5.10. By tracing the initial desired outcomes in the original plan and then in the actual activities conducted, I highlight the way in which the changes in the initial plan to the actual lessons shifted the addressed outcomes from a slow build towards addressing all of them to one that primarily focused on experiencing Second Life. The initial plan had the building of objects and role-playing during specific times, with the interaction, use of English, and experiences outside of their lives are threaded throughout. With the adjusted plans, the teacher focused on activities that primarily allowed for interaction with the 3D World with the hopes for providing experiences outside the students’ normal lives, participation in the online space through the use of created objects, and self-expression through adjusting the avatar’s appearance and changing its clothes. Even in Unit 3, when
the students did create items for Second Life, these were graphics created in a different program and then brought into the Second Life space by the work of the researcher on behalf of the students and teacher in my role as a support to the teacher.

*Tracing the shift in design away from the initial, desired outcomes.* The change from a plan that attempted to address all 7 initial desired outcomes to the one that resulted was not a single decision. Rather, the ongoing shift occurred as small decisions were made. In Table 5.11 below, I have outlined how the teacher’s goal or purpose for each Unit changed as she revisited the entire plan during her planning sessions for the subsequent stage. Her goals for the four units during her initial planning sessions had a heavy focus on moving from participating in other’s activities to develop their own items and activities for others to use and participate with. This focus shifted to simply experiencing Second Life. Creation was done outside of Second Life.

<table>
<thead>
<tr>
<th></th>
<th>Initial Planning Sessions</th>
<th>Unit 1 planning Sessions</th>
<th>Reflection and Unit 2/3 Planning Sessions</th>
<th>Reflection and Unit 4 Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1</strong> Goal</td>
<td>Learn basics of movement, building, and interacting. Participate in-world activities</td>
<td>“Experience and be able to function in Second Life”</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unit 2/3</strong> Goal</td>
<td>Create items in Second Life, Design our activity, participate in-world.</td>
<td>Create items that we can use in Second Life, Design our activity, participate in-world</td>
<td>Use picture from Unit 1 to create a picture in another program that we might show in Second Life.</td>
<td></td>
</tr>
<tr>
<td><strong>Unit 4</strong> Goal</td>
<td>Use English to role-play our own activity in-world with students having built the materials to use</td>
<td>Use English to role-play our own activity in-world</td>
<td>Use English to run an activity we find in-world</td>
<td>Participate in activity in-world using items students created in Unit 3.</td>
</tr>
</tbody>
</table>

*Table 5.11. Shifting Goal of units*
The slow shift of the goals and implemented plan away from her initial was not due to the teacher’s lack of desire to incorporate the technology. Rather the changes were based on multiple smaller decisions made throughout the planning process that had the effect of disconnecting the implemented activities and plan from the desired outcomes.

During the reflection and planning sessions, the teacher expressed her thinking behind the rational for her decisions related to the set-up of the classes. As such, I was able to access her rationale for her design decisions. The teacher based her decisions primarily on the following rationale as stated by the teacher: Time, assumptions about the students’ abilities and levels, requirements of course, past way of teaching, and restrictions of the environment.

I have outlined the design decisions made by the teacher and the point in the process of design and implementing those decisions where made. In table 5.12, I organize the rationale, as described by the teacher, for her decisions regarding each desired outcome.

<table>
<thead>
<tr>
<th>Desired Initial Outcomes</th>
<th>Design Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial Planning sessions</td>
</tr>
<tr>
<td></td>
<td>→ → → PROGRESSION OF PLANNING TIME</td>
</tr>
<tr>
<td>Expanded experiences for students by interacting with others in and out of school</td>
<td>Students will create projects with others outside of school.</td>
</tr>
<tr>
<td>Practice of English Language skills in real interactions with others</td>
<td>Students will have real interactions with others around the world.</td>
</tr>
<tr>
<td>Development of technical expertise through building and creating objects</td>
<td>Learn to build during units 2/3 and use those creations in 4</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Participation/ contribution in the online space by using, building and creating objects</td>
<td>Unit 1: use what others have built Unit 2/3: Build and create Unit 4: Use what we have built</td>
</tr>
<tr>
<td>Student self-expression by building and creating objects and use of avatars</td>
<td>Develop our own in-world space where others can learn about us</td>
</tr>
<tr>
<td>Taking on different points of view use of avatars and role-play</td>
<td>Role-play in Unit 4.</td>
</tr>
<tr>
<td>Experiences outside of the students normal/ closed lives interactions with a 3d virtual world</td>
<td>Frequent interactions in Second Life will allow them to become different students.</td>
</tr>
</tbody>
</table>

**Table 5.12. Shifting focus of teacher as revealed by activity planning decisions**

As can be seen in this table, the shift away from many of these initial, desired outcomes was not made all at once, but rather over time as each unit was lived and the next was planned. Of the seven initial, desired outcomes, only four of them were still being partially addressed by Unit 4. There was a shift from students being creators and co-producers of the Second Life world to their becoming users of the space. Additionally, as Unit 1 became primarily about the development of the skills to be able to function in the world, the activities became disconnected from participation in the world.

Development of the practices leading to true participation was shifted to Unit 4 and in so doing became displaced for the focus on skill development.
Take-up of design influences daily decisions about design. The changes in design for each unit didn’t happen in a single planning session either. As can be seen in Table A.1 (appendix A), there was a shift during Unit 1 from excitement, to frustration that the students weren’t progressing step by step through the environment as she had planned, to eventually managing the students so that they would stay focused on the steps of the activities she had planned.

Adjustments made to interim units 2 and 3. After unit 1 Ms. Savvin reflected that at times, the classroom was chaotic and that the students didn’t produce much work. She identified the need for more structure for the students. Due to this, she decided that in Units 2 and 3, they would not return to Second Life to create anything. Rather they would create items in their other programs that we might be able to work into the activity that they would do with another class. The teacher reflected on the interest and excitement that had carried over into other projects when connected back to Second Life. Specifically, the teacher was impressed with the quality of work that the students did when using the pictures that they had created in Second Life. “I have done this project for a couple of years [comic page of themselves]. This year I told them to create a second page where they use their Second Life picture. They were so creative and did more than just copy the example I told them to use” (Teacher reflection and planning, 12/8/09). Due to this, she decided to commit to doing more with the final project with the students. The focus for our time during Units 2 and 3 was really to find another class to work with and project to do for Unit 4 when the students returned to Second Life.
Changes to the final project. Although Ms. Savvin and I both spent many hours trying to find another class or group that was willing to participate with us in a project, we did not find a match due to time differences, class format difference, and that Ms. Savvin wanted one group for all her classes. Finally, one group was willing to go through our scavenger hunt related to the History of the Internet and leave a comment on the pictures at each location. They were not able to be in during all our class sessions, but they were willing to leave the comments during the time when the students would be back in Second Life. Ms. Savvin decided that she would just have the students go through their own project and read any comments posted by the other class to her students the day right before February break as a special treat rather than having the students read them in world. In this case, it was not the practices of the students that were the final determinate of the project but rather our ability to make the connections with another class that would match the structure she had developed for this mini-unit.

Design take-up and practices influences decisions for subsequent year. After Unit 4, Ms. Savvin decided that she would not do Second Life for all her classes next year. She expressed some of her thoughts during the final reflection sessions with me (February 16 and June 18, 2010):

- “The students don’t stay on task. They are all doing their own thing and you don’t know what they are doing. Some are doing what they should but others are not.”
- “We can’t make them do it. Some want to but most of them just want to play with their clothes and drive the cars.”
• “Unless we can have another group or have our own land [space in the virtual area] we aren’t able to really able to do what I want to do.”

• “I think it is good for them, but they don’t do anything. I guess we could show their pictures but that was really in Comic Life [another computer program].”

• “Unless the district is going to support this so I can have more time to plan and have things I can use in Second Life, I don’t think I want to do this for all my classes next year.”

**Summary for Practice influences Design.** As I have demonstrated, there was a slow shift for Ms. Savvin from a design aligned to seven desired outcomes related to changing the practices of students within the room to unit plans and implantations that reflected her more traditional approaches to her classroom. This shift was not a philosophical change but rather resulted from design decisions made over time that were informed by the teacher’s interpretations of classroom practices. The way the design was taken up did not match the classroom practices she was comfortable with and saw as proper for learning. Although she designed out of many of her desired outcomes, the tools to reach those outcomes were still available within the classroom. As Ms. Savvin did provide time in each class to work on their own, the students did take up practices that made more full use of the space.

**Summary: Shifting design and practice creates tension.** The teacher’s ongoing design for the use of Second Life influenced and was influenced by the practices in the room in multiple ways. Although she did design specific instructional strategies related to the resources, the planning and her teaching approach, these strategies had varying levels
of take up by the students. Primarily it was those strategies that impacted the ongoing structure of the classroom and its space that most influenced practices. These changes to the ongoing structure were 1) the change of the spatial resources of the computer lab and Second Life, and 2) the shift in teaching approach to provided more time for students to choose their own actions for completion of assignments and pursuit of interests. These designed instructional strategies were taken up in practice. The focus on demonstrating only a few skills each day, the worksheets for focus, and the use of the iTouches as proxy for the teacher’s teaching were not taken up as the teacher desired.

This inconsistent take-up of the designed strategies subsequently influenced the teacher’s ongoing planning process. The teacher’s ever-developing design adjusted to those practices perceived to be developing in a specific manner in an unexpected way. She redesigned to focus the activities and her redirection of students towards completion of the assignments and development of specific skills rather than towards her initial desired outcomes for the use of Second Life. This redesign took place over the course of the entire semester of units and planning with a slow shift away from her desired outcomes as she made daily decisions that were deemed necessary for the students to learn the needed skills. The student take-up as seen in both Finding 1 and Finding 2 began to develop practices that extended beyond the design and ongoing redesign of the teacher. Thus, the practices supported by the teacher were different than those being developed by the students although both were focused on the use and learning of Second Life. It is this tension between practices that I address in Finding 3.
Research Finding 3: The social space began to be constructed from the margins of space and time.

Research Question 3: What was the nature of the social space that emerged from the changing social practices?

As my third research question asks to describe the nature of social space as emerging from the changing practices, by very definition it must be understood within the context of the previous two findings’ discussions of the changing practices in that social space. In Finding 1, I explained how the changes in space were taken up through practices that were 1) multi-directional, 2) diffused, and 3) hybridized. In Finding 2, I identified teacher’s design that most influenced practices. However, the take-up of the various strategies and changes to the space influenced a redesign away from her initial, desired outcomes and towards more traditional classroom practices (and roles). Thus, the changes in practices of the students through the take up of design and space were in tension with the changes in practices of the teacher as she sought to redesign the social space. In this section, I will examine the resultant social space as constructed from these changing practices and negotiated tensions.

To describe the nature of something is not to describe its components, but rather how the essential elements interact to create that nature over time. I defined the elements of social space as the interactional structures of the space, the resources of the space, and the people in that space. To understand the nature of the social space, I need to additionally understand how these changed and influenced one another over time. In this
way, I operationalize social space by examining the inter-relatedness of these three aspects within the social practices overtime.

In order to best understand the ways that the different elements connect together, I have chosen to use specific stories of three students to expose the nature of the social space that emerged from the changing practices. The first looks at Kevin, a student who contributed significantly to changes in the classroom social space by developing a set of practices around providing assistance to other students. The second story is about Gabriela, the girl who was recorded throughout her time while in Second Life. Our access to Second Life through Gabriela allowed us to see the development of practice and social space as students interacted with students from outside the school. The third story is about Julian, a student who desired to build in Second Life. His story traces his own development of the skills to build and his eventual creation of objects in Second Life.

**Need help? Ask, call, IM, chat, or walk over: Kevin’s story of changing expertise.** Kevin’s story revealed the way that the changing practices related to access to new interactional tools and spaces combined with a decrease in teacher-directed time to allow for shifting the practices of providing help. The social space that emerged was one that saw multiple, though at times, competing approaches to sharing that expertise and thereby providing help to others.

One of the practices frequently enacted in the classroom was that of getting and receiving help. This practice shifted during the time of the Second Life and was one of the few practices that continued to remain changed after the units completed. Table 5.13 provides a view of the progression in change for the whole class around this particular
practice as the number of requests for help from the teacher decreased and the number of requests for help from others increased. I was not able to include the data from students helping online within the table. Though I observed this occurring an increasing amount with the most on any one day being 15, I was unable to document every such interaction, as our view into Second Life interactions was limited to one computer recording or what I observed in passing.

<table>
<thead>
<tr>
<th>Day</th>
<th># of Requests</th>
<th># of students</th>
<th>Kevin</th>
<th>Others</th>
<th># of Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>32</td>
<td>10</td>
<td>8</td>
<td>6</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>U4 D1</td>
<td>18</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>U4 D2</td>
<td>9</td>
<td>4</td>
<td>12</td>
<td>9</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th># of Requests</th>
<th># of students</th>
<th>Kevin</th>
<th>Others</th>
<th># of Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>U4 D1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U4 D2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5.13. **Emerging Practice of Help.**

Over the time of the Second Life Units I found a steady decline in the requests for help to the teacher. Kevin became the individual that others in the class turned to for help in Second Life. This was a slow transition that can be tracked through the class sessions I observed. Interwoven in this story is how the changes made to the classroom space and structure by the teacher allowed/supported/positioned the space for Kevin to take on this role. At the same time there was an increase in the amount of time that first Kevin and eventually three other students were out of their seats and helping others in the class.

Also of importance is that though the number of requests decreased, the students asking
the teacher for help dropped so that in the last four sessions in Second Life, the average number of students who requested any type of help from the teacher was five with three of these students being the same. The teacher’s practice also changed in that she stopped showing the students how to do specific actions in Second Life as much and shifted to directing them to the resources she had provided (iTouches and handouts) that had the information on them.

**Initial foray into providing help.** Kevin was a student who took up the increased access to expertise and learning opportunities made available through the changes in space and time such as access to multiple tools of interaction, closer proximity of classmates, and allowance of time at the end of class to work (described in Findings 1 and 2). As he did, there developed a tension between his desire to explore and learn in Second Life as quickly as he could and Ms. Savvin’s control of student activity driven in part by her desire to make sure all students had learned the skills through the preset activities of her lesson plan.

Day 1: During the initial introduction to Second Life, Kevin was corrected twice by the teacher for interrupting as he discussed what he would do when he made it into Second Life.

Days 2 and 3: During the first two class periods in Second Life, the teacher also reminded him that he needed to be following along during her walkthrough. During the second class session, Kevin changed the appearance of his avatar to be extremely unique, with giant bat-like wings. Other students in the class started shouting over to him on how he had done this as they could see him in-world. Ms. Savvin responded that they could ask him when they finished their work. Kevin, then showed those who sat next to him and also got up to show other students. The teacher asked him to go back to his seat on seven different occasions. All seven times, he did, but then would get back up when other students requested (Analytic memo of the classroom video descriptions, 10/13-15/09).
In day two and three, Kevin first begins to help other students. The teacher recognizes this but directs that help is to be given only after the regular assignment is done, thus placing this practice as something to be done in the periphery.

**Taking on the role.** As the practices within the social space had changed, the social space had also shifted to allow for the development of certain practices on the periphery. When there was opportunity, however, Kevin facilitated the movement of these practices from the periphery into the more formal, lesson portion of the classroom interaction. He did this by taking on the role of support when the teacher was not able and so left a gap. Note the following log from my field notes:

Day 4 of the unit (the third day in Second Life): The teacher provided iTouches for all the students, with the directions for performing all the basic skills in Second Life. This day also happened to be the day that the software unexpectedly had to be updated during class in order for anyone to log on. Kevin spent his time, first reading the skills on the iTouch and then practicing them on his computer. As other students were able to log on and they experienced difficulties or confusion, they would ask for Kevin for help as the teacher was busy installing the software. Kevin initially only helped a few students and the teacher thanked him for this. The rest of that class period he helped anyone who asked (10/16/09).

**Negotiation of the practices in the Social Space.** As Kevin continued to take-up the opportunities provided by the social space, the same tension in the space emerged between the teacher’s focus on each student learning for themselves through the tools provided and the emerging practice of students helping fellow students. As the teacher continued to redirect Kevin to sit down, he took-up the online tools as a means of continuing the practice. Again, note the documentation provided in my field notes:

Day 5 of the Unit: Kevin was again up and helping other students rather early in the class period. Ms. Savvin spoke to one female student in the back of the class, “Ok class, I am noticing something. [holds up worksheet], you have to do this. You have to do this by the end of class or you have no money.” Kevin was helping
another student at this point. Ms. Savvin walked up to Kevin and said, “Do you have iPod touch? Where is it? Directions are on there.” Then walks away. Kevin returned to seat at this point and completed his own worksheet. He then waited until the teacher was working with another student and would get up to help his classmates, returning to his seat whenever she finished with one student (10/19/09).

Day 6: Kevin began the class by completing most of the directions on the sheet. He was again asked to get up by classmates and help them. The teacher asked him on three occasions to return to his seat. He did and then would again get up to help other students. The teacher gave him a stern statement to sit down and to remain in his seat. Kevin did comply. In-world, he began to visit other students and ask them if they needed help. He provided this help through the chat or IM feature. Once a majority of students were completed with the assignment and other students were also being allowed to move around the room, Kevin continued to work with students by going to their computers and showing them how to teleport him so he could then come and help them (10/20/09).

**Emergent practice shifts social space.** As the practice of students helping other students in the classroom and within Second Life continued to be taken up, the role of who could provide help continued to expand to other students. This change in the roles of the individuals in the classroom meant that they also took up the tools available in the classroom in different ways. Additionally, although students did continue to comply with the teacher’s specific requests, the practices of moving around and helping others continued. Thus, the social space developed to be one in which the flow of help from students moved around the teacher, taking up the available resources to continue this work. The teacher was still someone who provided help, but was no longer the sole source for this help.

Day 7 of the unit: The teacher assignment was for each student to choose what they wanted to do for the day and then write 5 sentences about it at the end of the period. During this period, there was an increase in those who were getting up and moving around the room to help others. Kevin worked much more online, interacting with other students, teleporting them to various locations when they wanted to see what other students had done. Kevin continued to work both online
and moving around the room to help classmates, but an additional six students were seen doing the same. This meant that half the class was moving around to help other students at some point during the class session (10/21/09).

Day 8: The teacher conducted a step-by-step walkthrough for more than half the class period. As she demonstrated each step in what she wanted the students to do, she would then provide them with time to do what she was doing. During this time, Kevin attempted to get up and help others, but the teacher asked him to sit back down. He then began to chat online with other students, asking if they needed help and what they were doing. When the teacher was about to move to the next step, she looked around the room at students’ computers and saw Kevin exploring and said, “ok Kevin is not ready- stop flying [in Second Life] and get on your ipod touch. Follow directions on ipod touch please.” At this point Kevin said in a lower voice, “Ya lo hizo. [I did it already].” The teacher said to the entire class, “If you are not on your inventory, you need to be on your inventory” (Classroom recording transcript, 10/22/09).

As the teacher released the students to complete the second part of the activity of organizing outfits, Kevin was again up and moving around to help others. However, he primarily focused on helping the boys and two girls who wanted to drive cars. There were three girls who were up and helping other girls to adjust and find outfits. During this time, there was also an increase of in-world interaction about the clothes being worn (Field notes, 10/22/09).

Day 9: Kevin continued to move around the room and in Second Life to help other students. However, other students were also up and trying to help their friends. As Kevin moved to more online support and less movement in the room, Ms. Savvin didn’t ask Kevin to sit down. He was seen in-world asking for teleports to different students and then asking if they needed any help. One interesting moment was when Marcela was helping Gabriela. Gabriela was the student who was at the computer recording. Kevin was also in-world trying to help her. Ms. Savvin directed Marcela to return to her own seat and get to work. Marcela returned to her seat and Kevin left that area in-world. The teacher then sat down and helped Gabriela work through the worksheet and assignment. After 2 minutes of the teacher helping Gabriela, Marcela began to move to other students in the room again to help them (Analytic memo from parallel analysis of video and in-world video, 10/23/09).

During Unit 4 of the Second Life series: The class returned to the computer lab and Second Life. The assignment was to follow a specific path to pre-set locations throughout Second Life and collect information at each location. The points in the path were the items created by the students during Units 2 and 3. Kevin did not get up as much as he had during sessions 5-9 of the first unit. However, he was seen moving from person to person and location to location in Second Life. At one point about 20 minutes into the class the teacher checked the worksheet
Kevin had been given and found it blank even though he was about 2/3rds of the way through the series of locations. She said, “Kevin, Why do you think we give you paper? To write. If you are traveling and not writing anything hello hello hello. There are two things to write. One is the name of the picture and another one is the location, what do you like about it, what is cool there. You have to have information” (Transcript of classroom recording, February 4, 2010). Kevin did return to the start of the series and completed the worksheet that day. On the 2nd day of the fourth Unit, he continued both playing in world and also helping others (Analytic memo from parallel analysis of video and in-world video, 2/4-5/10).

**Persistence of the Practice.** During the end of the unit focus group sessions, five different students, in four different groups all mentioned Kevin and how he helped them. When prompted, Marcela stated that she started getting up because Kevin was getting up to help people. Francis told the group, “I liked to help everyone. I am smart with computers. I could show it.” Gabriela said that she hated computers and so “I didn’t like Second Life but Kevin showed me how to drive cars and then I liked it. It was cool.” Julian followed up on this by saying, “Yeah, I couldn’t do nothing in the computer… in the Second Life. Then Kevin kept showing me and Marielena did [help me] too. Then I could do it” (Focus group transcripts, 2/16/10).

Even later in the year, when I returned to visit the class for a follow-up observation during their podcasting unit, one student still recognized the role Kevin had taken on with Second Life. As she helped someone else and I commented on it, she said, “I am the Kevin of podcasting” (Samantha, classroom observation, May 7, 2010).

What Kevin’s story of changing practice tells us about the nature of the social space. When examining the nature of the emerging social space as revealed by Kevin’s story, I found that each element of Social Space was influenced. The people involved in the interactions did not change in terms of who was interacting, however, their roles
within that space did certainly shift and change as Kevin, and others, began to take on expert roles and provide support and guidance typically found solely with the teacher. The location certainly changed as the students utilized multiple spaces of interaction and moved across those spaces to help support one another. The interactional structure also changed a number of times through the units on Second Life. However, the final emergent nature was one in which Kevin, and others, provided support and help to classmates through methods that were not as readily seen by the teacher. The teacher attempted to maintain the formal interactional structure whereby students were to be focused on their work and the teacher provides support. However, through Second Life, student participants subverted that power structure through persistent and creative uses of interactional tools and through movement around the room while the teacher was busy. In this way the students provided the majority of help and support to one another.

**Making friends and influencing practice: Gabriela’s story.** In Gabriela’s story, I am looking at the practice of interacting with those outside of the classroom that remained as a possibility and on occasional reality. This means that although the majority of these interactions do involve Gabriela as that was the view I was able to see and she tended to be one who interacted more frequently, there are other reported stories of interaction with students outside the classroom through Second Life documented in my field notes that I have also included. Again, I tell this story chronologically to highlight the progression of increasing confidence in interacting with others from outside of the classroom. The first set of interactions with outside students shows the uncertainty of changing practice within the interactional framework in place in the classroom. Gabriela,
and others, are not sure how they are to interact and even if they are allowed to interact with others.

Day 1 (One interaction): The teacher interacted with another teacher during her presentation to demonstrate the possibility of this type of interchange (Classroom observation, 10/13/09).

Day 2 (No interactions observed): No interactions noticed

Day 3 (One interaction): An outside student appears and greets Gabriela. Gabriela asks the teacher, “Someone just said hi to me. What should I do? I don’t know.” Teacher responds, “I mentioned this might happen.” And then returns to helping another student. Gabriela then asks Samantha sitting next to her, “What should I do” Samantha responds, “I don’t know.” At this point the online student messages: “Ok. Goodbye” and walks away. (In-world recording, 10/15/09)

Day 4 (Two interactions): There were two different interactions with Gabriela. The first one, she calls me over and again asks, “What should I do?” I respond, “Say hello, ask her name.” Gabriela does just that. The two exchange names and then walk away. The second interaction with an outside student is similar. [End of class heard on the audio recording. Translated from Spanish.]

Samantha: What did you do today?
Gabriela: Nothing. I did talk to two students from another school.
Samantha: Me too. I mean one. Who did you talk to?
G: Sabrina and … someone else.
S: Oh. I talked to Ryan.
G: No. I talked to two girls. It was cool. I wish we could talk to them more.
S: I know. That would be fun. I wonder if Ryan was good looking. He is fifteen.
G: You are so lucky.
S: I know.
Teacher [to class in English]: OK class. Second Life… quit. Then shut off computers.
(In-world recording, 10/16/09)

As interacting with outside individuals became a more frequent occurrence in the Second Life portion of the social space, Gabriela, and others, engaged more frequently and for more prolonged interactions. Interacting with “outsiders” was not specifically a part of the lesson designed by the teacher. The teacher’s redirection to work on assignments defined this activity as not appropriate activity during the lesson time. As
you will see, there were a number of times when the teacher’s directions were misunderstood as redirections. At other times, the teacher did indeed define outside interactions as something that should take place after completion of the worksheets or even, on the last day in Second Life, outside of the classroom. Whether misunderstood or actual, the students assigned meaning to the teacher’s redirections and so the practices related to outside interactions were thought to be a ‘non-lesson’ activity.

Day 5 (One interaction): A student approaches Gabriela and they exchange names, ages, countries where from and Gabriela just asked, “So what music do you have there?” The audio from the classroom picks up the teacher’s voice saying, “Giselle, Kevin, Joshua, Samantha, you should not be talking about other things. Do your worksheet.” Gabriela is heard to say, “Oh no.” She then types into the chat box. ‘I have to go. Bye.’ The other student responds with, ‘Ok. Bye.’ (In-world recording, 10/19/09)

Day 6 (Three interactions): Two of these interactions were reported by students in the room. They did not provide much detail beyond that ‘they talked with them.’ The one student told the teacher and the teacher replied, “that is cool, isn’t it. Some of them may have helped build these places. You could ask them” (Research field notes, 9/20/09)

The final interaction was between Gabriela and Megan. The assignment for that day was to find a partner and to take pictures in three different locations with that person. Gabriela had not found a partner but instead had gone to two of the three locations by herself. At one location she had taken a picture of herself. At the second, I had helped her by being her partner at that location. At the third location, Gabriela met Megan. After exchanging some information about each other, Megan asked what Gabriela was doing. Gabriela explained. Megan offered to be her partner. They then took a picture and began to talk about what they like to do in Second Life. Gabriela said she liked to drive around. They then both got out vehicles and drove around. They collide with some others that were also driving vehicles. Those in this larger group now laughed. Joshua shouted across the room to ask, “Que esa chica?” {Whose that girl?} Gabriela shouted back, “Mi Amiga.” {My friend.} At this point the group had been driving their cars under water. The teacher said to the whole class, “I understand that you can still drive at the bottom of the ocean but not such a good idea to drive there. Something bad can happen to those who are driving at the bottom of the ocean.” Gabriela then asks Samantha to help her get out of the water quickly. After Gabriela is teleported, she loses track of Megan as they had not friended one another. (In-world recording, 10/20/09)
Day 7 (Six interactions observed): Although there were two interactions discussed in class as reported by my field notes and four observed in world, these were only portions of the interactions. Gabriela primarily drove her motor cycle around. Through the screen recording, I was able to ‘see’ three interactions in progress before she drove away. However, the recording followed Gabriela’s movements and so I only viewed pieces of the dialogue. Gabriela interacted with one other person. However, after exchanging names, ages, and countries they parted ways. Gabriela was focused at that point on adjusting her appearance with the new wings she had discovered. The other person walked away after waiting for a response to a question. (In-world recording, 10/21/09)

Day 8 (Two interactions observed): These two interactions were also only portions of conversations as Gabriela walked by groups. Of note is that one of these had three students from her classroom and two from another class in California. (In-world recording, 10/22/09)

Day 9 (Three interactions observed): One interaction was seen only as Gabriela walked by. The second two that were ‘seen’ fell in close proximity in terms of time and influenced one another. I have included an abridged transcript below as it best demonstrates the interaction between the classroom (left) and online (right).

Gabriela: Hello. Are you the same Megan?
Megan: Yes. What happened last time?
Gabriela: I had to leave water. I couldn’t find you.
Megan: We should friend
[They friend each other]
They begin to talk more about things they both like. Gabriela shows some of her clothes.

Teacher: Guys, you need to do your worksheet. You need to use your folders from yesterday.
Gabriela: Teacher says I have to do my work.
Megan: Ok. What do you have to do?
Gabriela: Take pictures with different outfits.
Megan: Again? That’s cool. I can help.
Gabriela: Ok.
[Beginning to do work. Gabriela tries on different outfits and the two discuss them]

Teacher: Ok Everyone, you need to have a partner and be taking pictures.
Samantha: Gabriela, do you have a partner?
Gabriela: Yes.
Samantha: Who?
Gabriela: My friend from the computer.
Samantha: Cool. [Stands up and walks to Gabriela’s
Teacher: You are not supposed to be up and around. Samantha, who is your partner?
Samantha: I don’t have one. I was asking Gabriela.
Teacher: Gabriela, do you have a partner.
Gabriela: Yes, miss.
Teacher: Ok Samantha, you can work with Giselle. She needs a partner too.

[ Gabriela and Megan continue to show inventory items and talk about them.]

Marcela: Teacher, look. Someone from a different school. Can I talk with her?
Teacher: You should do your outfits and pictures first and then you can talk to her.

Gabriela: Teacher says we have to do work first and then can talk to you.
Megan: Ok. I have to go soon.
Gabriela: Sorry.
Megan: Your teacher sounds mean
Gabriela: She’s ok. I just have to do work first.

Through IM
Megan: Are you in trouble?
Gabriela: No. But I have to do my work first.

(Transcript compiled during the side by side analysis of the classroom video and the in-world recording, 10/23/09).

As can be seen in the transcript above, Gabriela had now defined the student from the other class as part of the class, to the extent that she felt comfortable having Megan as a partner for a class assignment. This was not only for the teacher but also her friend in class who asked about her assignment partner. Also clear is the teacher’s non-inclusion of the students from other schools within the formal, or lesson part of the class. Though Gabriela has begun to interact in ways that includes the outside student, Ms. Savvin has defined that interaction as something to take place on the margins of the class.
In the final entry into Second Life, the students in the class continued to include and encourage participation with the activities of the class. The teacher again redirects those interacting with outside students to the class assignment, suggesting that the interactions should take place after the assignment or even on the student’s own time.

During the two days in Second Life in Unit 2, there were many more interactions. This was likely due to the fact that there were more students from other schools as multiple schools from our time zone had joined the group by February. The interactions are much longer as the students explain what they are doing, friend the other students and, in at least five circumstances, travel together for some of the scavenger hunt. There are two interactions of note that occurred in these two days.

Unit 4, Day 1 (Seven interactions) & 2 (Six interactions):

First, two students encountered and friended a student who had helped to create the area in which they were standing at that point. They were excited about this and told these students from the other school about their own creation that was a part of the scavenger hunt. They then moved back in the scavenger hunt path to show their new friends. At this point the teacher came over and reminded the students that they needed to be moving forward and not standing around and talking. The students did move away from the other students but once the teacher had left, simply moved back. This group then traveled through the entire rest of the scavenger hunt together. The other students showed the students from class how to adjust properties on objects in Second Life (something these two had not learned yet).

The second incident that I observed involved Gabriela. She was moving through the scavenger hunt with two of her friends from within the classroom. They also begin to interact with two other students from another school in California at the second stop on the scavenger hunt path. They first explained what they were doing. They then began to drive their cars and when the teacher started to come near, they teleported to the next location. They started to laugh as they teleported looking like they were still sitting in the car but left the car behind.

Teacher: ladies ladies ladies, using the cars to teleport is not a good idea.
Gabriela: ok
Teacher: You will lose the cars. Then who will go and find them? Because
you are trashing other peoples property. So I think it is not a good idea to
use the cars.
[Students laugh again]
Teacher: get off and take them back
Gabriela: ok
Teacher: when you are done if there is free time, you can play with them.
Let me see your papers.
[Students show papers that have the first location completed.]
The teacher then raised her voice and address the whole class, "Guys, guys, you
need to write the information down. You can get back on and talk to them
later.” At this point Gabriela and her two friends leave the students from
the other location. When they reach location six, however, they find those
same two students again. The other two students share that they had
actually been going through the scavenger hunt and leaving comments for
them. The group of five then continued to the end of the period together.

(Transcript compiled during the side by side analysis of the classroom video and
the in-world recording, 2/4/10).

When I asked in the final focus group if anyone had interacted with others outside
of class, Gabriela shared that she did not go on Second Life outside of class, but she did
wish she could talk with them more. She explained, “This was cool. I mean this was the
best thing. I had so much fun. I liked computers” (Focus group, 2/16/10). Her last
statement is significant, as Gabriela had introduced herself to me as someone who “hates
computers” (Student interview, 10/13/09)

What Gabriela’s story of changing practice tells us about the nature of the
social space. In Gabriela’s story, the social space became two-fold. The teacher nearly
exclusively interacted in the classroom. The online space was observed from outside,
over the students’ shoulders, or was managed when inside Second Life, such as
teleporting students to the appropriate location for the purposes of keeping the tasks
moving. For Gabriela, Second Life was a rich environment for interacting with others
outside of the classroom. However, the space was not as divided. When she was required to have a partner for an assignment, for example, the online one was just as valid as a classroom partner until the teacher clarified this. On the final two days, multiple groups made of students from a variety of locations interacted together. Certainly the number of individuals who were a part of the Social Space had changed with the additional of Second Life. The number of interactions seen with Gabriela merely walking around suggests the likelihood of a larger number of interactions for other students that had not been viewed by me. However, these interactions were not sustained over time. Although interacting with outside individuals became a regular activity in the social space, it was an inconsistent part of any one individual’s space due to the inconsistent appearances of outside individuals. Part of the development of practice and social space is that it occurs over a period of time. This lack of consistency meant that the outside individuals themselves were not a part of the space.

A second part adding to this inconsistency was that it was unknown for the student if they would be allowed to interact with the other students. The role the teacher and the classroom space played on the interactional framework was interesting. There were multiple times when the teacher was redirecting the entire class to focus on the task, and Gabriela interpreted this as something meant for her directly. On Day Five, the teacher was actually talking with a completely different set of students about an unrelated item, but Gabriela took the teacher’s redirection to mean she also had to stop what she was doing. By the end of the time, however, the teacher’s management from the classroom space of the Second Life space and the interactions occurring there became
less of an impact. The students continued to complete the assignments and complied with
directives provided by the teacher, but they also continued their interactions with others.
The nature of the social space was one in which these passing outsiders where more
involved with the some of the work of the students as they were in Second Life, than the
teacher.

**Learning on the outside: Julian’s story.** Julian was very interested in the
Second Life program. He equated it to other games he had played. He had a special
interest in learning how to make parts of the environment. He asked about making things
in class on the first day. In addition, he asked twice more on the first time in-world to
clarify that the environment had been made by the users. Julian pursued his interests and
eventually learned to build in Second Life. He continued this practice into at least May of
that school year. His journey to learning this skill was not a clear trajectory, however.
Nor did he learn during the class period. The developing practices in the classroom
supported Julian, but he also went beyond these classroom practices to include others,
outside of the class, in helping him learn what he wanted to learn.

**Covert learning.** In learning to build, Julian first needed to learn the basic skills.
He did learn these during the class time. However, when he struggled in completing the
tasks, he developed a new process for learning skills. He learned from classmates and
outside people. This can be seen on Day 5 when Julian struggled with the tasks set before
him that day. His struggle was on understanding not just the directions of the assignment
but also how to do it, that is, the actual skills. The abridged transcript of this event from
the classroom video (10/19/09) is below:
Julian sighs and leans back in his chair. He looks around the room and raises his hand. The teacher walks over to Julian and Julian says, “I don’t know how to do this.” The teacher responds, “You have an iPod Touch? That is what it is for.” She then speaks to the entire class, “People, people, Follow the directions on your iPod Touch. Everything you need is on the iPod Touch.” After the teacher leaves, Julian turns to Marielena who was sitting next to him. He speaks to her (inaudible) and she shrugs her shoulders. She then raises her hand. The teacher comes over to Marielena. After Marielena asks her for help, the teacher gives her directions on how to complete that portion of the task, including verbal directions on how to complete the skill needed. Marielena thanks the teacher and the teacher moves to another portion of the room. After the teacher leaves, Marielena turns to Julian, who had been watching the whole time, and smiles. He smiles back at her and turns to his computer and begins working. This story is a rather striking example of the students working around the teacher’s insistence that students use the iTouches as their primary sources of help. The teacher had utilized this approach to help students, such as Julian, gain confidence through using tools and resources to learn on their own. Julian’s fellow classmate, Marielena, continued the emerging practice of students supporting each other already discussed by helping Julian. She did this not by actually showing him how to do the task, but by having the teacher show her, and thereby show Julian. Although this example is the most detailed time when Julian learned through others, there are a total of 8 different times when Kevin was also with Julian helping him. Marielena and Julian often were talking together as they worked. Julian also confirmed this during the focus group at the end of Unit 4. Interviewer: “How did you learn when you were in Second Life?” Julian: “My friends. Mostly they showed me” (2/16/10).

As Julian’s skills increased, his desire to build came into play. Here are four different interactions related to Julian’s progression around learning to make objects in Second Life. This series demonstrates Julian’s desire to learn to build and the way that
the teacher’s response defines building as a practice that is not done in this classroom’s social space. He did use the time provided by the teacher for exploration to learn about building from me as I had some level of expertise.

Day 4: After I show students the special jacket I had made for the students to wear in-world.

    Julian: Mister, you made this?
    Researcher: Sort of. I used a jacket that already existed and added to it.
    Julian: Wow. Ms. Savvin, can we make something like this?
    Teacher: We will see. That is very difficult to do. Mr. Frink is very good in Second Life.
    Researcher: There are some websites that can take you step by step through how to do things like this.
    (Transcript of classroom video, 10/16/09)

Day 5: When teacher shows the mall to the class.

    Julian: Other people made all of this?
    Teacher: Yes, other students made all of these things. Isn’t that cool?
    Julian: Can we make stuff?
    Teacher: Today we are not making things, we are taking things. On your iPod touch, you will see directions for how to take something. It is very important to…..
    (Transcript of classroom video, 10/19/09)

Day 7: At the start of the free choice period

    Julian: How do I make car
    Teacher: I’m not planning to do that. It would take too many minutes to do that. Right now we are just learning the basics. You need to do that first.
    (Transcript of classroom video, 10/21/09)

[During this time, Julian did have me show him how to make an inventory item into a racetrack to drive on with a car. (Researcher field notes, 10/21/09)]

Day 9: After completing the assignment for the day (one of the first in the room to be done)

    Julian: How do I make my own stuff?
    Teacher: You don’t
    Julian: you said people all made this, how do you make it?
    Teacher: we don’t have time to do it and you have to pay money to have a place to make it.
    Julian: oh.
    (Transcript of classroom video, 10/23/09)
As can be seen by this series, the teacher had effectively positioned the learning of how to build as something not to be done in the classroom at all. The restrictions in class did not cause Julian to stop his pursuit of his interest.

Julian was persistent in his desire to learn about building in Second Life. This next example occurred during the planning time with Ms. Savvin in Second Life [Nov 6, 2009]. He was not able to utilize the time in the classroom as the teacher had restricted this time. However, the location of the social space expanded outside of the classroom. Because he had access to Second Life, he had ongoing access to this portion of the social space. Below is the transcript of my planning with the teacher and then my brief, side interaction with Julian. When I asked the teacher later, she told me that Julian had been online a couple of times when she had also been. He had also logged in one day when he had been absent during the first Unit and engaged with another class during their time in Second Life. The transcript of the online audio between the teacher and myself and the Instant Message conversation between Julian and myself are below.

Teacher: Oh God, Julian is inviting you to a voice chat call, I can’t, I’m going to decline him. He’s there, do you see him
Researcher: I was looking at someone else, oh no I must not have Julian. Oh wait, I found him.
Teacher: no he’s right there, how did he manage to get here where we are, do you see him,
Researcher: well I’m in a different spot than you are now, could you invite me, or teleport me I mean, that’s cool that he is in here
Teacher: he keeps bugging to talk to him

Jeremiah: Julian, Hey there!!
Julian: Hey mister
Jeremiah: I heard you have been in here?
Julian: I like to come here
Other kids are here now I met some
Jeremiah: REALLY??! That’s awesome.
Have you been here a lot?
Julian: Sometimes
Jeremiah: Have you found anything interesting?
Julian: This kid knows how to build things
Jeremiah: Awesome. Did he show you?
Julian: a little
[Julian logs out]
Chat Log: 11/06/2009: 2:36 PM
Researcher: you have seen him in here before?
Teacher: he keeps bugging are you talking to him
Researcher: hmm mm I’m chatting with him now.
Did you know he has been coming in here and has met some students from the other schools?
Teacher: Maybe that’s who told him about build things so much. okay I have to go a little bit earlier because my computer is off with the optics, I’ll go now, whenever you’re ready just close the door

Julian had taken up the resources of the spaces available to him to continue to learn. Though this interaction, the teacher again made it clear that she was not interested in supporting his desire for learning to build. However, Julian had expanded, through his own interests, what the social space was for him to include time outside of class time. His own practice had developed whereby he had taken up the space of the margin and the individuals who were passing through on those margins to learn the skills not available in the classroom space. In the final example, Julian brings back his practice from the margin and shares what he has created.

Unit 4, Day 2: After completing the assignment, Julian called me over to his computer
Julian: Mister, look at this. [shows a car on his screen]
Researcher: Nice. Where’d you find that one?
Julian: I did it. I made it.
Researcher: What? That’s awesome. When did you do that?
Julian: I met some students from school in Chile. They taught me.
Researcher: So you made this at home?
Julian: My aunt has a computer. She let me use it.
[Julian shows Kevin and Fernando who both ask him how he did it.]
(Researcher field notes, 2/5/10)

Although certainly the most extreme example of this, the practices within the classroom social space mirrored Julian’s own progression through learning skills. As seen in Table 5.9 from Finding 2, in many instances, students were learning the skills of Second Life prior to being taught by the teacher. Of particular interest in this finding is
that, of the 15 skills identified as “required”, eight of those skills were first learned by at least one student during non-lesson time and the majority demonstrated nine of the skills during non-lesson time. Also during the non-lesson time, nine additional skills were seen being taken up and six of those by the majority of students. This means that the practice within the classroom had developed, such that the majority (n=17) of the 24 skills demonstrated by students in the classroom were learned during non-lesson time.

*What Julian’s story of changing practice tells us about the emerging nature of the social space.* In looking at Julian’s story, there is a clear movement towards interactions, spaces, and people that did not include the teacher. Julian did not look to actively resist the teacher. Rather, his own interests, the emergent practices that supported his interests, and the teacher’s rejection of building for class meant that his interactions were directed away from the teacher, towards others students or even those outside of the classroom. He was one of the few who reported moving his Second Life interactions to include time outside of the class period. His development of the skills he was interested in, as what happened with other students, became something done on the side or even, in one case, hidden from the teacher.

As has already been demonstrated, the nature of the social space is one that supports getting help to learn the skills needed to complete the assignments. In this instance, Julian did not simply want help to figure out how to complete his assignment. He wanted to pursue his own interests in Second Life. This interest was initially something that the teacher had wanted the class to engage with. However, she had redesigned the plan and removed building objects as an objective. Thus, as Julian wished
to pursue it, she did not provide the support nor suggest a time when he could learn it. Not even the margins of the social space, namely that of the time at the end of class, was made available to him to pursue his interests. However, Julian, through his own practice, redefined the margin by taking up the extended space and other people within Second Life outside of the classroom setting. Thus, he did continue to pursue his interest, born in the classroom, through time outside of class. However, he reconnected that outside of class time back into class by showing his creation. I do not have the data within this study to clearly explore when the margins of one space begin to develop a social space of its own, however, in this particular instance, Julian did take up this space as part of his practice within the social space of the classroom. Thus, the nature of the social space is to have permeable boundaries that are defined by the practices of those in the social space as they take up resources and interactions with others.

**The Nature of this Social Space.** There are common themes and trends across all three stories and the additional classroom data provided as context within each. Each story hit upon the three aspects of social space as I have defined them but can also be utilized to highlight a specific aspect. Kevin’s story shows how the interactional framework shifted in terms of getting help. There were more people interacting more often, in differing roles, utilizing a larger variety of tools. Julian’s story highlights how the space for meaningful interactions occurred on the edges and outside of the actual class time. The location of interaction had shifted. For Gabriela, it can be seen that the interactions with outside individuals did become a regular part of the Social Space, however, there were not outside individuals who became regular participants in the
classroom social space. Interactions amongst fellow students increased and students became more open and inclusive of those from outside their own classroom when interacting together.

Interestingly, the teacher’s participation in the shift of the social space became less critical as time progressed. Rather, her planning and ongoing reinforcement began to support shifts back towards more traditional practices in her classroom and thus a more traditional construction of the social space. She did support some of the practices contributing to the shift, as long as they resided in the periphery of the class. It was not that the teacher was against the emerging changes; rather her practices were focused on the completion of the activities that had been developed to best move forward the requirements of the classroom as she saw them. What I found, however, is that the student practices continued to grow within this periphery, developing practices that supported a social space with a nature that was 1) hybridized across multiple spaces, 2) exhibited an interactional framework that was inclusive of larger participation in multiple roles and used multiple interactional methods, and 3) was developed with ever increasing participation from the individuals in the space and was open to participation from those outside of the classroom. This pressure of practice shifted and repositioned the interactional structures as the students hybridized the practices across spaces and unified their locations of interactions into one social space, inclusive of the periphery and those on that margin.

As can be seen in the Table A.2 (Appendix A), there is an interesting switch in desired future practices when aligning the initial desired outcomes of the teacher, the
practices seen of each and the future desired outcomes. As the students experienced and engaged with the practices and shifts in the social space shifts, their desired outcomes became more aligned with the teacher’s initial desired outcomes as seen in the following quotes during the final focus group session (2/16/10).

- “We should do more with people in other schools in Second Life. We can learn from them.” “We could even do an event with them.”

- “We should [be] practicing our English all the time. We can practice it here because we have to type everything we want to say.”

- “I think we could use Second Life in our school.” [Prompted] “If we learned social studies in Second Life. We could learn about much more. Like other countries and history.”

- “I thought we would make stuff. Like all the other students in there. You look at something at it says ‘created by someone’ We met one of those students. That was cool.”

These comments emerged during the final focus group session. In contrast, after experiencing the shift in practices occurring in the classroom, the teacher changed her desired outcomes to be less focused on many of her original purposes for introducing Second Life. Her direction for future design work moved away from these items that the students were most interested in having happen. It is not to say that she no longer desired these outcomes. Rather, she believed that she was not able to reach these outcomes as she had hoped. Thus, the teacher’s envisioned social space was ironically the nature of the social space that was being created by the student practices that she pushed to the margins.
Chapter 6- Discussion and Implications

Introduction

The underlying question that initiated this research study was one regarding the design and take-up of technology in a classroom. Yet, the story that emerged from my findings was not one of design and subsequent response to design, but rather one of shifting power as told by changing practices. Interestingly as the social practices continually constructed the social space of the classroom, the practices diverged from the design. The findings provided evidence and illuminating examples of nuanced ways in which practices constructed this class's social space and the social space afforded and constrained practices. In this section, I apply the theory developed in my framework regarding practice, social space, and design to better understand what happened with the integration of technology into the classroom.

The question that directed me down my path of research from my own background as a practitioner and researcher was “Why does it seem that when teachers bring technology into the classroom, the teaching and learning practices don’t change?” What I found was that teaching and learning did indeed change in my setting, just in different ways than the teacher intended. Thus, for the teacher the inclusion of Second Life was not a success. However, the inclusion did actually meet many of her initial intended goals. The way that she incorporated this immersive, interactive technology removed some of the restricting practices allowing a decentering of the classroom social space and the room for all participants to move within both the space and time of the classroom. These two connected and supporting shifts within the social space fostered a
change in how design and practice interacted, becoming dialogical as students became active in practice and developed new flow of interaction with the social space.

**Decentering Time and Space through Practice**

Underlying the changes to the social space was a change to the flow of the practices and as such the way that both space and time were positioned. The social space was decentered in a number of ways; spatially within the classroom and through Second Life, with the new interactional resources, with discussions and interactions between student and teacher, in task oversight and assignments, in the use of time, getting help, skill acquisition, and with the change in interactions.

Through the introduction of the new space of the computer lab, the expansion of space and technological resources for interaction through Second Life, and the structure of the lessons to allow for time of choice at the end, the teacher initiated the decentering of her role. The instructional focus was the completion of the task using the resources provided. The tasks she provided, combined with the resources of the space also did not restrict students to a particular path they would follow in completing the tasks. Although the teacher still controlled the activities assigned through grading, the control over social interaction was no longer through her. Students’ engagement with the tasks was through the technology as the teacher desired, but interactions were centered on their own needs and interests. Thus, it was the practices that centered the social space and as such the center moved with the ebb and flow of the use of the space.

The concept of decentering has been used in a variety of ways. Piaget (1950) utilized it to describe the development process of moving from an egocentric view of the
world to one in which the individual can see situations from another’s point of view. There are discussions of decentering whiteness as an essential move for critical pedagogy (Ellsworth, 2005). The structures and speech centered on an established, embedded, and essentializing world view are purposefully illuminated as central to the classroom and alternative thinking and approaches are introduced to decenter this underlying view. In online education, some have questioned the extent to which a teacher can effectively decenter herself without losing the important conversation that should be occurring (Anagnostopoulos, Basmadjian, & Mccrory, 2005). Feminist pedagogy also discusses decentering as a means to empower students by honoring their lived experiences and providing opportunities for the development of their voices in classroom practices (Gore, 1995). This lattermost theoretical definition merges well in thinking about the way that social spatial theorizing can be taken from discussions of Lefebvre’s city planning to that of classroom design.

Lefebvre (1991) discusses decentering when he explained that historically, centers of a city would shift depending on what was happening. He suggests that centralizing in a city is a political move to establish a base of power from which to dictate activities and flows (in his instance: that of commerce). He suggests that the center of a city is actually movable with the flows of everyday life. Within the social space of my classroom, as seen in my findings, the flows of everyday practice within that classroom shifted the center of the space.

The teacher initially provided spatial resources and removed some of the restrictions typically associated with her planning (Finding 1). However, as the class
continued, the teacher attempted to recentralize the classroom. The purpose in doing this was to unify the space with a set of approved, or as de Certeau calls them, proper practices. Through labeling practices as ‘not proper’ she was also positioning these practices as no longer part of the social space. However, the classroom had already developed practices that made use of Second Life and the structuring of the time of the class. Thus, there was a conflict between the use of Second Life and the format of the class that decentered the classroom and the recentering of the teacher that developed a divergence of practice. This divergence of practice of the teacher’s design and the everyday practice of the students created, as Lefebvre called them, contradictions and conflicts within the space. In his discussion of contradictions and conflicts within centering, Lefebvre provides us with the conceptual turn to understand the relationship of the spatial-political practices of centering and that of the space-shaping practices discussed by de Certeau of strategies and tactics. “They [contradictions and conflicts in space] are still present, along with what they imply, along with the strategies and tactics to which they give rise” (p. 333). It is through the contradictions and conflicts that have been developed through centering practices that give rise to the strategies and tactics within the social space.

**Teacher design and redirection as strategies (and tactics) of practice.**

Applying de Certeau’s concepts of strategies and tactics within the framework of centering (and decentering) illuminates how the practices developed along the margins and yet also repositioned the social space as a whole.
Design as tactic. When looking at the teacher practices that supported the development of the social space, there is an interesting phenomenon. Her practices were, using de Certeau’s terms, both tactics and strategies. In my study, I found that the teacher had an array of approaches that fluctuated throughout her time. The teacher’s instructional strategies could be seen as attempts to actually move beyond the status quo. Her use of Second Life and the instructional strategies initially conceived were designed to shift the social space of the classroom away from the traditional structures and provide new and innovative opportunities for her students. Though not a major aspect of my study, it is important to recognize that the teacher was actually utilizing the inclusion of Second Life as a tactic within the larger organization. She, herself, was also utilizing the resources within the organization that she could access to change the typical practices, what was deemed proper, and define new trajectories for herself and her students. She was one of the few teachers in the country who attempted to bring the Second Life environment into her classroom as a regular part of her curriculum.

It is interesting, therefore that it was not the curriculum or activities that she planned that most influenced student practice. The changes to the space and time were the most influential to the change in student practices. Through her one change of the inclusion of Second Life, she a) expanded the interactional space, b) increased access to spatial resources and tools, and c) permitted students the full level of control with the space and over the tools/resources. Yet my study suggests that there was one other critical element that she addressed in a tactical way: time. Although time to implement was one of the major barriers for teachers in the literature (Ertmer, Ottenbreit-Leftwich,
Sadik, Sendurur & Sendurur, 2012; Ottenbreit-Leftwich, Glazewski, Newby & Ertmer, 2010), Ms. Savvin purposefully left time for the students to explore or even play in the environment, valuing student exploration time over her own designed time. By providing decision power over the use of time in combination with the liberating nature of the spatial changes, Ms. Savvin had redefined the role of the students as designers. They had design access to each component of social space and in so doing, decentered the design process as well.

**Redesign as strategy.** Although a broad and sweeping statement, I found, as Tatar, Roschelle, Vahey, and Penuel (2003) found in their study, “Teachers want and need control over their classrooms” (p. 35). Thus, the teacher began a process of redesign with a centralizing trajectory towards greater control and direction over the students. Even so, although her practice was caught in the trajectories of social-historical, spatial practices these speak to the strength of momentum of previous practices and the controlling influence of the systems in which they developed and not the teacher herself.

Although the teacher started with an ideal, conceived space and envisioned practices with a designed trajectory to see those practices realized, the pressures of past social practices in tension with newer, emerging practice within that space influenced a shift in the trajectory. Her own practice began to utilize strategies through redirection to establish what de Certeau (1984) calls ‘proper’ practices. de Certeau suggests that by developing proper practices there is a claim of a place (the classroom) as one’s own and therefore asserts the right to determine the appropriate practices in that place. This was seen in Findings 2 and 3 with the redirections of students back to her approved practices
and the positioning of other activities and interactions as not to be done at that place or time. These substitutions achieved short-term goals but, in their simplification, actually undermined progress toward the original goals of student autonomy, agency and meaningful interactions. When social space is centralized, it shifts the focus and flow from the use defining the center of the social space to a structure or person. When a strategy is utilized to centralize a role, then the practice must bend to support that centralization. The social space must support the practices that support the role of the person as the center. Thus, the classroom was designed to redirect the practices of all involved to that center role, in this case, the teacher. However, the students’ practice trajectories took on a different directionality.

**Room to Move in Time and Space**

Decentering allows for a change in the flow of practice. It is no longer through a central figure or space. Lefebvre did provide another insight into the issues involved with centrality seen in my study. Working from a Marxist viewpoint, he suggested “it is primarily in connection with scarcity of space that the matter of centrality has arisen” (p. 333). Although I am not looking to introduce a Marxist viewpoint within this study, I do wish to build on the underlying concept that part of the need, as seen by teachers, for centralizing practice in a typical classroom is due to the limit on both space and time. There are set goals and outcomes for each class. There is limited time and a set space in which to meet those goals. As such, we centralize our practices around a set path called curriculum. This curriculum is then divided into smaller sets of time, called Units, and finally into specific lessons for each day. Although this appearance of logical progression
and division is what is seen in the process of design in classrooms, this strategy eliminates the choice of the individual to move within that space and time. The labeling and parceling of time forces a homogeneity of practice on the individual to move together as a ‘class.’ The simple phrase “right now is not the time for that’ places a defined label over the individual choice, relegating that activity as one that is of the margins rather than the approved center. This typical process of design or planning “introduces time into space by force, to rule time from space- time in the process being confined to proscribed uses and subjected to a variety of prohibitions.” (Lefebvre, 1991, p. 340).

In the classroom of my study, however, there was a change in practices. The teacher did still label some activities as not to be done at specific times. However, she had provided the time at the end of class (and one full class period) when those activities could be done. She removed the prohibitions of most activities related to Second Life during this time. There was also a change in the space of the classroom with the addition of Second Life. The interactional space was not merely expanded but became changeable based on the actions of the students. If they wanted to interact with a small group of others, the online space allowed for that. They could interact with multiple groups in different locations within Second Life. They were able to use avatars’ movements and gestures as an additional layer of communication, move to different locations if one was not interesting, change their own look or share that look with others. Said simply, through the addition of Second Life to the classroom space, there was room to move that did not exist previously.
**Student practices as “tactics.”** I have described the design practices of the teacher as strategies by which she looked to direct or provide direction for the trajectories of practice of the students. Tactics, using de Certeau’s theory, are the ways in which the students actually developed their own trajectories in ways that differed from the teacher’s. As was seen in Finding 1, the take up of the spatial changes did not result in trajectories moving in one single direction. Rather multiple paths were developed through the social space, taking up the resources of the space to develop practices that were not primarily focused on shaping the space, as the teacher’s strategies were, but rather on using the space. That is “the trajectories [of tactics] trace out the ruses of other interests and desires that are neither determined nor captured by the systems in which they develop” (de Certeau, 1984, p. xviii).

This was exemplified in my study in Finding 1 as students moved to the lab and took up these resources to hybridize practices across spaces and tools. When provided with iTouches for individual support and guidance, a few students used the iTouches to self-teach and used this knowledge to develop a system of diffused expertise. In the instance of Julian and Marielena, Marielena utilized asking help as a tactic to provide support to Julian that had initially been denied. In all of these, the students’ tactics were to take-up the changed space into practice became the resultant change in practices seen in Finding 1.

I suggest that we can understand the inconsistency of take-up seen in Finding 2 as the effect of tactics of everyday practice. As seen in Finding 1 (Shaping of practice/space), through their practice over time, participants shifted the centralized
‘place’ (as de Certeau termed it) that was being established through the strategies of practice. Thereby they prioritized not a single place of power for centralizing of practice but created multiple places with multiple resources to develop practice. Through the living of those multiple practices, connected practices and spaces together to develop a social space that was partially constructed from the margins. As seen with the charts on help and news skills in Finding 2 and 3, the students made the social space their own through working around instances when the strategy of defining of proper moved their practices to the margin. Yet through tactics these practices of the margin constructed the social space in a way not designed nor envisioned by the teacher.

**Tactical development of aligned practice.** When viewed through the lens of tactics and strategies of practice, the connection between types of practice and resources within the classroom is more clearly seen. The teacher utilized her role to tactically deconstruct the typical practice of structuring lessons that provided direct, initial support in that class to provide more time for the students to both work and later explore. Her attempt to reconstruct an alternate structure that was strategically aligned to the typical teacher-centric focus was not successfully as the students developed their own practices for a structure of support. The practices persisted and developed as they were more aligned with the resources of the space; spatially, interactionally, and socially.

The new structures were not only aligned to the space but also to the students’ own trajectories of practice. As seen in Finding 3, the students had different types of trajectories that, at times, were in alignment with the teacher’s plans and at other times went in different directions. Two of these directions were that of having fun and
interacting with other students. Thus, the practices around getting help and learning new
skills became organized around playing with the environment and with one another
within the environment. Through this play the students learned new skills and helped one
another. Although the teacher utilized strategies of redirection and the use of focusing
worksheets, the students merely adjusted to work around the former and accommodate
the latter. Thus, the structures of practice that persisted were those that were aligned with
the resources of the space and the trajectories of practice of the participants.

**Changing Concept of Design**

In my findings about her design, we saw that she did not have a singular design
plan that was implemented across the units but rather her design changed over time.
Lefebvre (1991) provides the best view for understanding, from a social space
perspective, why her design changed throughout the course of the units. Lefebvre
discusses that there are three different processes by which social space is produced. He
explains that those who plan for and organize social space, such as the teacher in my
study, utilize representations of space or conceptual space. Representation of space is the
conceptual organization of the various components of the space. When viewed from this
point of understanding, the teacher’s initial process developed a plan or conceptualization
that included primarily those elements she had seen with her colleague from another
school. As these were separated from the spatial practices of either space, she was able to
conceptualize an ideal scenario. However, this was a concept, this was not the actual
production of the space itself. As she began her more typical practice within the school
setting, the spatial practices of her particular context came into play. She continued to
primarily develop the social space from a conceptual approach. The design of the lesson, as seen in my findings, was such that the specific skills were assigned to a specific activity in a manner very similar to what Lefebvre described in his critique of the then modern planners. These planners, who when producing social space through a conceptual process, assigned activity to specific spaces. Building on Lefebvre’s theory, I suggest that this process of connecting a specific skill with a common spatial practice (e.g. that of doing a worksheet) divorced the activity from the meaning that was attached to it in concept as the activity became merely a routine of the space with little meaning in the new social space beyond that of the routine: completion of the activity. In this way, the initial meaning of the practices she had seen was removed through the process of design.

**From the margins.** Although understanding design through Lefebvre (1991) helps to explain the curious disconnection of the activities from the initial purposes, it is through de Certeau that I wish to understand the process of design of social space through practice. As de Certeau (1984) explains, design does not define social space. Rather, the everyday practices and the use of the space provide meaning to social space. Thus, to describe a change to a social space purely in terms of the changes to the physical space or the design ignores the lived nature of social space.

de Certeau (1984) explains that strategies of practice are employed to control the development of the social space. One such strategy is through the design of the social space. de Certeau discussed how city planners designed the spatial resources for the purpose of directing practice. In this process design is not a single, cause and effect. It is actually dialogical. How previous walkers of city streets acted, influenced the way that
the city planners designed the streets to attempt to direct their flow. The actual walkers of the designed street appropriated the design of the planners and traced their own paths for their use in their everyday practices. In a classroom, the dialogical aspect of the design process is more pronounced as the designer, the teacher, is there in the classroom as a participant in the space but with the role to design. Thus, the design is ongoing and can change based on the designer but also the participants of the space. The dialogue of this classroom design shifted in that the students had greater access and influence to different points of the design process and different levels within that design flow. However, the teacher did not design for student production of space and control of practices but rather didn’t intentionally restrict through design. This important distinction helps to explain the contradictory design processes seen in the teacher’s instructional strategies.

That is, the teacher’s take-up of the Second Life, as identified in Finding 2, was as a tool for students to demonstrate their skill acquisition. She defined the edges of the social space through her strategy of design as the computer screen and by so doing created an expectation only of the demonstration of skills on the computer program rather than as interactions to be experienced. For the teacher, Second Life interactions were on the very periphery or margins where students enacted the practices that she had defined as not proper. As such, the affordances described by the literature, some of which the teacher had seen and even desired such as the connections with others around the world or the chance to create the environment that is used, were not relevant to the practice trajectory that used Second Life as a program as opposed to a shared space and were thus marginalized through application of censorship or redirection.
However, for the students, Second Life became a central and integrated place and part of interactions. As the resources were used, the practices shaped the social space and the meaning around the use of those resources. As such, the tactics in the classroom moved the students from being a consumer or user of the program to being participants within that space. They interacted with others outside of the school within this space and participated with the activities available in the space. These activities were not those defined by the teacher for the purpose of moving through a prescribed set of directions to prove competence but were engaging with the environment by doing such things as driving cars, exploring landscapes, ‘playing,’ and for a very few, building. Through this participation and engagement with Second Life, the students more fully accessed the affordances found within that space.

Thus, even as the “strategies” positioned Second Life as a managed tool for class work, the “tactics” of practice were lived out that defined Second Life as a space and thereby redefine the space of the classroom. A parallel can be seen in de Certeau, Giard and Mayol’s (1998) discussion of the social space of neighborhoods. They described how within neighborhoods there were practices of inside and outside. However, overtime the practices of ‘inside’ began to appropriate the space of the neighborhood. I would suggest that my findings illuminate this same idea though with a reversal in direction. The classroom social space was constructed by the strategies of practice with trajectories toward the traditional practices. Yet, also there were the practices that emerged from the margins, the edges of the classroom social space. These practices were those of students spanning spaces to help one another using a variety of tools, of individuals owning their
own learning and pursuing skills that were not taught or even encouraged in the classroom, of interacting and including those online as participants in the space. The practices of the margin appropriated the space to the extent that, in the end, the students had taken up and redefined the desired practices, conceptualizing similar social space as the teacher had when first envisioned prior to her take up of the limitations of the spatial-historical practices of the school setting.

**Discussion Summary**

In this discussion, I am not suggesting that my findings lead to the reductionist concept that Second Life will decenter a classroom. It was the specific dynamics of this classroom social space and the approach of the teacher that resulted in a decentered social space. However, this study clearly identifies that Second Life can provide an opportunity for decentering practices. There is a pressure that exists with the use of Second Life in the classroom of these alternative practices to classroom normalizing influences. Through structure, redirection, and practices that limit students’ access to the space and the time, the teacher could certainly reduce the take-up of these alternate practices. However, Second Life provided space for the center, as defined by practice, to change. It also creates space on the margins of any classroom social space, regardless of the control imposed on it.

As the students had room in both space and time to move within the classroom social space, the teacher strategy of centering lost much of the ability to control. As was seen in the findings, when the teacher attempted to centralize how the students received help, they moved their interactions to the margins of the social space where it required
the teacher to either be right behind them in the classroom, viewing their computers or to be in location in Second Life, viewing the chats. As the space became decentered and students had room to move, the control of that space could no longer be exerted to the same extent. The social space changed from a controlled space to a viewed space. The teacher could still view practices, but this meant that her practices moved from directing to that of overseeing and possibly redirecting.

This discussion has implications on our understanding of design within the classroom around the use of technology. Design is aligning resources to support the trajectory most desired. The teacher centralized the practice in an attempt to ensure a single trajectory so that the end/goal may be reached. This research challenges this approach to classroom design. Within my study there were multiple ways that space was produced through a variety of practices that crossed the space with different directionality. The lived space is the intersection of these trajectories with each individual designing. As the teacher removed restrictions in the classroom more of the design of use fell to the students, as such they designed through own paths through the space. The students did navigate to ensure that they met the requirements of the teacher as part of that path, just within their own path. More interesting was that these paths also included the teacher’s own desired outcomes that she had shifted away from in order to centralize and unify. Thus, it was not through centralization that her end goals were met. In fact her centralization was counter productive to that path. It was rather the initial introduction of the technology with a format that allowed for the desired affordances to emerge.
Conclusion

Through applying theory to findings I can understand the development of social space from practices and see how practices come out of possibilities of that space. I defined social space as sites of social interaction defined by the same group of people engaging with a shared interactional structure at the same place over time. As can be seen in my study, each of these aspects is given meaning as they are joined together through practice trajectories into one social space. Through the use of the strategies of design and redirection, the teacher sought to define the meaning for each of these aspects and so define the proper practices within the room. The strategies of the teacher had separated those practices she determined to be “proper” from other practices, and, in so doing, categorized different possibilities of practice for the students such as interacting with students from other places, learning how to create objects in Second Life, use the tools of Second Life to provide support, and develop and share expertise. However, the social space is defined by the practices of the participants and as such, social space is always in movement. The boundaries are fuzzy as each path crosses and interacts with others to define the meaning of the space, for each member and what part of that meaning will be share amongst those within the space. It is along this boundary that the students in this class took up the resources of the space through practices with different trajectories than those defined through the strategies of the teacher. It was through appropriation of the classroom social space, that the classroom and online spaces, initially separated through strategies of practice into a proper place of primary interaction and a secondary space shifted. The unifying, but not essentializing, power of everyday practices and trajectories
of practice joined the outside margin and the inside classroom into one social space of interaction with practices taking up the resources of the space as appropriate to use.

**Implications for Future Study and Practice**

In this study, I chose to focus on the way that social practices were developed and lived and explore how the shifting practices impacted the ongoing shaping of the social space. I found that the complex interactions that effect the social practices and thus the way that the social space develops has less to do with the specific activities designed and more to do with the way the resources of the space are positioned, taken up, and allowed (or not). Though the teacher did end up doing much work around a restriction of the practice in her later design work, I want to make clear that it was largely through the affordances provided by the teacher that practices were able to be developed on the margins. Many of the practices I have discussed, Ms. Savvin pushed towards the edges. However, she was also the one who had put in place the ‘edges’ of Second Life and time at the end of classes when students could explore and develop practices. She had put in place the necessary resources of space and time for the students to develop practices.

This recognition of the role of teacher in allowing, though not formally sanctioning, suggests to the researcher that as we study the implementation of technology into the classroom, we do not focus on the activities designed and how students performed on these activities, but rather we examine the practices that develop and how these practices affected the social space as a whole and overtime. This investigative work is done by understanding the classroom, not primarily as a location to develop skills and acquire knowledge, but rather as a social space for the development of practices that
could be drawn upon for developing skills and creating knowledge. As the social space is made up of trajectories and therefore is always changing and moving, we cannot understand it through simply defining the structures of the space nor identifying the resources of the space. Trajectories define the resources available for the construction of the practices. Understanding how trajectories of practice define and connect the practices rather than the decomposition of the space into its individual elements provides insight into the nature of that space. A practice point of view can address the emerging technologies that offer a wider opportunity for practices to develop in a variety of trajectories that is not limited to a strict definition of space or location of interaction.

Thus, there are two theoretical areas that my research suggests for future research. First, we need to explore the relationship between the resources and design of social space with those tactical practices that persist. The question we would want to understand is: What are those resources and design that align best with persistent tactical practices when working with specific technologies? How do the tactical practices that persist make better use of the resources and design of the social space than those that do not?

Secondly, further research is needed to examine the various methods of decentering the classroom social space while supporting diverse trajectories of practice that are supportive of learning goals. As my research has identified, there are powerful shifts in practice that can occur as classroom social space is decentered and participants develop diverse trajectories. In this case, many of the desired outcomes came to be. However, this was not due to the intentional support of the teacher. In bettering incorporating the
learning affordances of technology, we need to better understand how to be supportive of
the creative development of practice in our classroom social space.

A final area of research that this study suggests is methodological. My analytic
process for understanding how practices were developed through and across social space
was unique. As participatory technologies with spatial qualities continue to develop and
be utilized, we will need methods to better understand how practices flow across and take
up the resources of various spaces. Additional research will be needed utilizing this
approach to refine it and fully explore its analytic potential.

For the teacher-practitioner, there is a clear need to focus on the way that the
resources of the space are handled. I do not suggest the lesson is left unplanned, but the
findings of this study highlight the need to ensure that the activities are in alignment with
the practices that are desired and beneficial to the students’ learning. These findings also
highlight the importance of leaving space for practices and structures to develop that
emerge from students’ trajectories. This is not to suggest that there should be structure
but rather that structure is very important. The teacher must engage with the thoughtful
introduction of resources and support of the development of structures aligned with these
resources and the students’ trajectories of practice. The teacher can accomplish this
through development of activities that have direction/meaning beyond the completion of
that activity. For example, nearly all the students enjoyed and engaged with driving the
cars in-world. Utilizing this direction, I showed Julian the basics of the complex skills of
building in-world through the construction of a simple race-track. This activity was
aligned with the resources of the space, continued the direction of the Julian’s practice
trajectories, and also met the overarching goals of the Unit. This example shows how the
design, both initially and ongoing, can involve student voice and meaning. In order to do
this, my findings suggest there is a need for a deeper understanding of instructional
design for teachers as it relates to the integration of technology into the classroom
specifically as it relates to what is and isn’t designed/afforded/allowed.

This study demonstrates a critical need to increase our focus on research of
technology integration in classrooms to have a greater focus on the students and how they
are developing practices. Certainly it is important to understand how students react to the
design put in place by the teacher. Yet, I propose that the next step in research of this type
is to look beyond what the students are doing in reaction to design or how they are taking
up the activities provided by the teacher. I recommend a look at what else they are doing
and why. That is to say, what are those practices that are emerging on the edges, that have
yet to be fully developed but have directionality that is different from what we are
designing for and what those practice trajectories might be able to tell us about social
practice, social space, and learning.
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### Appendix A- Tables and Lists

<table>
<thead>
<tr>
<th>Day</th>
<th>Rationale/Reflection</th>
<th>Change made for next day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>“Well, they seem very excited, especially about making money. They crack me up.”</td>
<td>No changes made.</td>
</tr>
<tr>
<td>Day 2</td>
<td>This was very frustrating. The students had a hard time reading the directions and moving. They also kept trying to go ahead.</td>
<td>I am going to create a more detailed worksheet and make sure all the students have finished each step before letting them move on.</td>
</tr>
<tr>
<td>Day 3</td>
<td>They loved doing this. The girls especially liked changing how they looked. The boys just wanted to drive their cars. I couldn’t keep all of them focused on the same thing.</td>
<td>I think we can try your idea. I will give them only a little direction and with the iPod Touches. We can see if the students can work at their own speed.</td>
</tr>
<tr>
<td>Day 4</td>
<td>I’m glad we had the iPod Touches because they could learn how to do things while I fixed Second Life. Of course, I had to keep them from driving their cars all over the place. You know what I just realized? I have no grades for this week.</td>
<td>I can have the student’s hand in the worksheet for a grade. But that will mean that they have to write more on it. I will want to make the worksheet have more directions on it so they stay more focused. Maybe, since they like driving so much, we could give them a car when they turn it in.</td>
</tr>
<tr>
<td>Day 5</td>
<td>I don’t know why they were so crazy today. They were here and there and all over the place. They didn’t even try [to follow the worksheet]. Some of them used the iPod touches but most don’t.</td>
<td>I guess I will need to make the handout have them do more. Maybe have to write sentences to show what they did.</td>
</tr>
<tr>
<td>Day 6</td>
<td>I don’t think I can let them be this crazy. They were chatting about all kids of things, they were up and around talking with each other. “everyone completed the assignment but they were just so crazy.” Do you [to the researcher] think for tomorrow we should just give them things to do and check off or write something?</td>
<td>I am still going to let them choose what they want tomorrow. Maybe that will get it out of them. I told them today they had to stay in their seats and I would come to them if they needed help but they didn’t stay still. They will have to write five FULL sentences tomorrow. That will help them to stay focused.</td>
</tr>
<tr>
<td>Day 7</td>
<td>I really liked that today. They didn’t want to do their sentences but I read them and they as good as they usually do.</td>
<td>I don’t think they can handle doing tomorrow on the iPod touch. I know we have the directions, but I think I have to show them. They don’t like to organize in their regular life.</td>
</tr>
<tr>
<td>Day 8</td>
<td>I am glad that I made them walk through it with me. So many kept trying to go ahead or were talking when I tried to explain. I think they all did it though, except Kevin because he kept moving around [He had completed the assignment].</td>
<td>I think I will lock their computers tomorrow while we show them what we want them to do. Then they can’t get on Second Life and will have to listen to the directions.</td>
</tr>
<tr>
<td>Day 9</td>
<td>They couldn’t even find partners. We kept telling them. They didn’t have to I guess. I just think it is more interesting with someone else. They all finished so fast after they found a partner. They are ready for us to keep going.</td>
<td>Maybe we could do something with these pictures since the girls like to take them so much. The boys just wanted to drive drive drive. So we can do something with the pictures.</td>
</tr>
<tr>
<td>Day 10</td>
<td>I am ready for this to be done. I think it was good but it is so hard with the kids all over doing different things. They just don’t listen. Even when you write it down and the words are in English and Spanish. They just don’t want to follow directions.</td>
<td>We will need to have detailed handout when they go in with other class. Maybe we should have a script for them to use. They can write out what they will say like they have to do for the podcast.</td>
</tr>
</tbody>
</table>

Table A.1. – Daily decisions about design
<table>
<thead>
<tr>
<th>Desired Initial Outcomes</th>
<th>Practices Seen</th>
<th>Future Desired Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expanded experiences for students by interacting with others in and out of school</td>
<td>T Encouraged students to interact with outsiders on 3 occasions. Requested that they focus on work on 7 occasions. Tried to find a set project that students could work with another class. The teacher had no interaction with others during class.</td>
<td>“I still want to have them work with another class. I just don’t know if I will have the time to plan this unless the district gives me time.”</td>
</tr>
<tr>
<td></td>
<td>S Increased interaction with others in class and also many interactions with others from outside of the school through this.</td>
<td>Ten students stated they wanted this more of this in the future. “We should do more with people in other schools in Second Life. We can learn from them.” “We could even do an event with them.”</td>
</tr>
<tr>
<td>Practice of English Language skills in real interactions with others</td>
<td>T Had them use partners (though no required English), write English sentences and learn vocabulary. Encouraged interacting with others when assignments were complete.</td>
<td>She wanted to have role-playing activities where students take on specific roles in English. “We will only be able to do this if the district gives me time to plan and has someone make the objects we need in Second Life.” [Also relevant for role-playing outcome]</td>
</tr>
<tr>
<td></td>
<td>S Almost all observed interactions with others in Second Life were in English. At times students even asked others how to say something correctly so they could enter it in the chat window online.</td>
<td>Mentioned as a positive of using Second Life in School (6) “We should [be] practicing our English all the time. We can practice it here because we have to type everything we want to say.”</td>
</tr>
<tr>
<td>Development of technical expertise through building and creating objects</td>
<td>T Decided not to work towards this desired outcome.</td>
<td>This is too tough for these students. Maybe if they had my class and then we did the after school club for just those kids, we could do this.</td>
</tr>
<tr>
<td></td>
<td>S A few students asked to learn how. One in this class (and one in another) actually built items on own.</td>
<td>Stated as an activity that they would want to do (7 stated, I described the types of work they had already work on) “I thought we would make stuff. Like all the other students in there. You look at something at it says ‘created by someone’ We met one of those students. That was cool.”</td>
</tr>
<tr>
<td>Participation/ contribution in the online space by using, building and creating objects</td>
<td>T Focus was shifted from contribution to ensuring students take care of others’ spaces.</td>
<td>Maybe work with someone else who could make what we need. Then we can use it.</td>
</tr>
<tr>
<td></td>
<td>S During Unit 4- “If we're not coming back can we leave this [scavenger hunt activity] for others to use? I want to leave a message for them.”</td>
<td>Discussion in two focus groups that they were not really part of the larger group but that they wanted to create their own space for others to use if they could.</td>
</tr>
<tr>
<td><strong>Student self-expression by building and creating objects and use of avatars</strong></td>
<td><strong>T</strong></td>
<td>Encouraged students to express through their Avatar. When students were creative, recognized it publically.</td>
</tr>
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<td>---</td>
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<tr>
<td><strong>S</strong></td>
<td>Students spent much of their own time on adjusting appearances. On Days 8 and 9 when some students accidentally changed their avatar drastically, they were very upset. One said “I don’t want to do this anymore. That’s not me.”</td>
<td>Listed as one of their favorite parts of Second Life (8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Taking on different points of view use of avatars and role-play</strong></th>
<th><strong>T</strong></th>
<th>Was not able to support this due to lack of time and resources.</th>
<th>Desired to have this be the focus in the future. Concerns of time and resources.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S</strong></td>
<td>Very little. One student changed outfit to match location when taking pictures.</td>
<td>One focus group discussed this in detail as a desired future item when they said Second Life was like a game. Two other students in different groups also mentioned being a character.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Experiences outside of the students normal/ closed lives through interactions with a 3d virtual world</strong></th>
<th><strong>T</strong></th>
<th>She provided opportunities for exploration and publically encouraged students who found interesting locations.</th>
<th>&quot;I want them to see that they can be different. I am not sure how to plan that. I think they just need to be in different situations in Second Life so they can see that they can be different.&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S</strong></td>
<td>Students did have many experiences outside of past experiences. They had the opportunity to interact through Second Life with others in other schools as part of their day. Many enjoyed the aspect of driving a car, something they couldn’t yet do in typical lives.</td>
<td>The students identified many more things they could and would want to do. They wanted to do own businesses, try out the different locations that the teacher had shown on the first day, create projects in Second Life. “I think we could use Second Life in our school.” [Prompted] “If we learned social studies in Second Life. We could learn about much more. Like other countries and history.”</td>
<td></td>
</tr>
</tbody>
</table>

Table A.2. Initial Desired Outcomes Traced through Practices and Final Future Desired Outcomes
A.3: Major interactive activities for students to use/do
1. Walk/Run
2. Fly
3. Take/give
4. IM
5. Chat/audio
6. Adjust environment setting (day/night)
7. Gestures
8. Use inventory items
9. Friend
10. Teleport
11. Avatar adjustment
12. Taking picture
13. Putting on/taking off clothes
14. Building/editing objects
Appendix B- Backgrounds of Teacher and Students from Stories

Kevin’s background

Kevin was a fourteen year old, male student from the Dominican Republic. He liked to wear hoodies to school in bright colors. His grades were above average in his class and his English language skills were at high-intermediate. During the 6 months spanning the start of the year until the end of the last unit for Second Life, he had two girls that he called his girlfriend. During the time of the first unit in Second Life, his girlfriend was in the 8th period class. He typically entered the room talking with some other student from the class though it was not always the same student. He was slender in build and would frequently stay standing until he was requested to sit down even if he wasn’t talking to anyone. During the classes I observed he was only absent one time, and that was not for a Second Life class session. This level of attendance was higher than many of his classmates. He frequently made ‘wise cracks’ in both English and Spanish, usually teasing someone else.

Kevin used one of the assignments in class prior to Second Life and both of the major assignments during the Second and Third Units to express himself. Ms. Savvin recognized his creativity in his work when she showed me his two pieces from these units. “He always likes to put his own ideas on everything. He really wanted this [the picture about himself in Second Life] to say something about him” (Interview/Planning, January 21, 2010).

Gabriela’s background

Gabriela was a fourteen-year-old female student from Puerto Rico. She typically entered the classroom with two or three of her friends, laughing. Very early on she said to me, “I don’t like computers.” She would frequently ask for help when she first encountered a problem. Her English language skills were upper-intermediate level. Gabriela was selected to be the one who worked on my computer and thus all of her in-world interactions were recorded and part of the analysis. In addition, the audio from that computer was recorded along with the screen recording. This allowed me to also hear what was said near that computer. The teacher said about Gabriela, “She will do well on your laptop. When she is by herself she works hard. She can do it unless she is with her friends. Then those girls just talk.”
Julian’s Background

Julian was a sixteen year old, male student from Chile. Julian was the oldest student in the class. He was typically quiet during presentations and lectures. He did talk with his classmates but usually only those right near him. He almost always would smile when approached by student or teacher. He usually entered the classroom by himself or with the girl who would sit next to him who was also from Chili. He almost always spoke in Spanish first and would frequently ask for others to repeat when being spoken to in English. When he discovered that I spoke some Spanish he would regularly look to teach me new words or phrases when he spoke to me. He was taller than most in the class and would sit hunched down in his seat during most of the class. He would often laugh when other’s made jokes in Spanish, adding to the joke.

Julian was described by the teachers as “a nice kid who doesn’t have much motivation. He will do what I ask him to but sometimes the language issues is in the way for him. He is a lower intermediate but I think he could do better.”