

FIRST-YEAR COLLEGE STUDENTS' PERCEPTIONS OF THEIR EXPERIENCES USING
INFORMATION AND COMMUNICATION TECHNOLOGIES IN HIGHER EDUCATION

by

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B.A., Kansas State University, 1994
M.L.S., Catholic University of America, 1997

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

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Department of Special Education, Counseling, and Student Affairs
College of Education

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Abstract

The increasingly integrated presence of Information and Communication Technologies (ICTs) on university campuses in recent decades has prompted calls for a better understanding of how students use ICTs in higher education, including the transition to college. While research indicates that students with higher self-efficacy are more likely to persist in college, current research makes few connections between students' self-efficacy with ICTs and persistence. Additionally, researchers in the area of student retention call for educators to understand how their students perceive the college's cultural environment so as to help students fit in at an institution and persist. Exploration of ICTs as part of a student's social, academic, and cultural experiences at the university offers educators and administrators the possibility of modifying the college's cultural properties in response to student needs.

This qualitative study investigated first-year college students and their use of technologies to address the following research question: How do first-year college students perceive their experiences using Information and Communication Technologies (ICTs) in the higher education environment? Employing interviews and a phenomenological approach, this study explored the experiences of 19 undergraduate students. Six faculty members or instructors were interviewed about their teaching experiences with first-year students and the extent to which ICTs were incorporated in those experiences in order to provide triangulation of data.

Through the analysis of interview transcripts and open coding, three themes emerged regarding how students experience ICTs in higher education. Statements from students and faculty suggest that students experienced ICTs in higher education as: a process of academic integration; situations for which they held internal or external loci of control when using them for academic purposes; and tools to use when becoming socially integrated into the university.

The findings of this study have the potential to assist university faculty, instructors, and other staff who are designing courses and services for first-year students. First, the study's findings indicate that instructors need to be as explicit as possible with their expectations of student use of technology. When students are expected to demonstrate certain behaviors with ICTs those behaviors should be both supported and modeled by faculty and instructors. Secondly, when using ICTs for academic purposes, faculty can help students feel more

responsible for their learning by providing them with opportunities to make decisions about how ICTs are used or to incorporate their own problem-solving or learning techniques with ICTs when completing coursework. Finally, faculty, instructors, and other staff should be aware that when first-year students are using ICTs socially, they are trying to create and maintain in-person relationships. Faculty, instructors, and other staff can guide first-year students to events and resources that will help them meet people and locate a social group in which they feel like they fit in.

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Approved by:

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ICTs are used or to incorporate their own problem-solving or learning techniques with ICTs when completing coursework. Finally, faculty, instructors, and other staff should be aware that when first-year students are using ICTs socially, they are trying to create and maintain in-person relationships. Faculty, instructors, and other staff can guide first-year students to events and resources that will help them meet people and locate a social group in which they feel like they fit in.

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Chapter 1 - Introduction

An engineering student recently stopped by my office in the university library and asked if I could show him how to insert an equation into a Word document. While the question itself was unique, it illustrates the type of questions for which students seek answers when encountering information and communication technologies (ICTs) in higher education: a combination of the commonplace (a word processing program) and the specialized (communication needs of an engineer.) When four-year colleges in the United States still see first-year students leaving college at an average rate of almost 21.3% (Knapp, Kelly-Reid, & Ginder, 2012), student persistence remains a concern for educators. Student self-efficacy and a sense of fitting in have been identified as contributors to student retention (Bean, 2005; Tinto, 1993). Existing research about student use of ICTs in higher education is predominantly focused on student self-efficacy in terms of using specific ICTs as tools to complete tasks (S. D. Smith & Caruso, 2011). There has been little attention paid to the roles that ICTs play in the social and literacy practices of students (Wilber, 2008). However, a developing field of studies known as “New Literacies” explores the ways in which ICTs transform what it means to be literate by tying social practices to how people use ICTs (Lankshear & Knobel, 2007). This study will explore how first-year students perceive their experiences with ICTs in higher education by framing ICTs as a social practice, rather than as a tool. By learning more about the social practices of students related to ICTs and their sense of fitting in, this study may provide insight into student retention issues related to the university environment.

This introductory chapter describes the current status of ICTs in higher education. The developing theory of New Literacies is briefly described in order to provide an overview of the framework in which ICTs will be discussed (Lankshear & Knobel, 2007; Leu, Kinzer, Coiro, Castek, & Henry, 2013). The chapter then explains some of the concerns associated with ICTs in higher education in light of student retention. The chapter will describe the purpose of the current study, present the questions to be addressed by this research, and address the significance of this study for higher education in general and for student retention in particular. The chapter concludes with the definitions of relevant terms used in this study.

Information and Communication Technologies in Higher Education

College students use many types of ICTs for both academic and personal activities, including email, online courses, library resources, instant messaging, and gaming (Jones, Johnson-Yale, Millermaier, & Pérez, 2008). A majority of students reported owning a dozen technology devices, and the average student used approximately 21 different kinds of software applications (Dahlstrom, de Boor, Grunwald, & Vockley, 2011). Yet, when surveyed, half of college students did not find that ICTs helped them to be more productive, and half reported entering college feeling unprepared to use ICTs in college (Dahlstrom, de Boor, Grunwald, & Vockley, 2011; S. D. Smith & Caruso, 2011).

Socioeconomic background, gender, race, and age have all been identified as factors that may contribute to a student's access to and use of ICTs. Within the broad spectrum of undergraduate students, research indicated that how students used ICTs and their self-efficacy with regards to using them varied, frequently in relation to gender or socioeconomic status (Ching, Basham, & Jang, 2005; Goode, 2010; He & Freeman, 2010). Disparities in the use of specific ICTs was found to correlate with race (Flowers & Zhang, 2003; Junco, Merson, & Salter, 2010). However, findings are not consistent from one study to the next. This discrepancy in findings may be partially accounted for by the fact that the studies occurred over a span of years that saw rapid changes in ICTs. Additionally, many studies examined either different ICTs or different uses of ICTs, making it difficult to compare the findings. Perhaps the only certain conclusion that can be drawn from the literature is that within any population, individuals are going to have different access to and uses for ICTs.

Researchers reported mixed results when studying the impact of ICTs on retention, persistence, engagement, and student development. Certain uses of ICTs in higher education were positively associated with student engagement in educationally effective practices such as active and collaborative learning, student-faculty interaction, and academic challenge (Nelson Laird & Kuh, 2005). Other studies found little connection between students' computer or email use and four measures of student development (Flowers, Pascarella, & Pierson, 2000). Nora and Snyder (2008) suggest that mixed results and absences of links "between technology and performance indicators/ outcomes such as grade performance, course completion, re-enrollment, persistence, and graduation rates" can be ascribed to a " huge gap in the research literature

specifically devoted to the empirically- and theoretically-driven investigations of the link” (p. 16)

New Literacies

New literacies is a developing concept that explores how technology transforms what it means to be literate. While new literacies is not yet formally defined, there are three common tenets to which many researchers in the field refer. First, literacy is a social practice (Gee, 2012; Street, 2008). Second, new literacies are deictic (Leu et al., 2013). And third, new literacies mobilize new values or ethos in how people practice literacy (Lankshear & Knobel, 2007).

New literacies defines literacy as a social practice, one in which texts only have meaning within the context of a society (Lankshear & Knobel, 2007; Street, 2003). When literacy is defined as meaning making within the context of a social group or community, then literacy, or communication of meaning, may occur through language and texts, or through visual, gestural, kinesthetic, or three-dimensional modes (Street, 2008). Members of a social group or community of practice are fluent in a set of common knowledge and practices, or Discourses, wherein

A Discourse is a socially accepted association among ways of using language and other symbolic expressions, of thinking, feeling, believing, valuing, and acting, as well as using various tools, technologies or props that can be used to identify oneself as a member of a socially meaningful group or “social network” to signal (that one is playing) a socially meaningful “role,” or to signal that one is filling a social niche in a distinctively recognizable fashion. (Gee, 2012, p. 158)

An individual typically acquires a primary Discourse growing up at home. According to Gee (2012), this primary Discourse forms who that person is in his or her “every day” life. When an individual becomes a member of new social groups or communities of practice, such as a religion, a school, or a sports team, that person will learn or acquire secondary Discourses. The concept of literacies as social practices that incorporate multimodal ways of making and communicating meaning opens the door to defining ICTs as a new literacy when they are used by a social group in a socially meaningful way.

New literacies are deictic, meaning that they exist only in a particular time and context. Each new ICT or upgrade to an existing ICT requires new literacy practices (Wilber, 2008).

Defining new literacies as deictic reminds researchers that literacy practices are no longer stable for years but that they continuously and rapidly change (Leu et al., 2013).

Finally, Lankshear and Knobel (2007) suggest that a literacy is “new” when it both incorporates new technologies and is part of an ethos or paradigm shift. The ethos of new literacies is more “‘participatory,’ ‘collaborative,’ and ‘distributed’” and “less ‘expert-dominated’ than conventional literacies” (Lankshear & Knobel, 2007, p. 9). That is, new literacies reflect an insider mindset while conventional literacies operate more within the producer-consumer ethos (Lankshear & Knobel, 2007). New literacies encourage collaboration and participation, as may be seen with blogs (Mortensen, 2008), fan fiction sites (Black, 2007; Ward Black, 2008), and learning management systems (Baskin & Anderson, 2008). With new literacies, everyone is encouraged to be an insider.

Student Retention and ICTs

The puzzle of why students stay at a college and why students leave a college has engaged researchers for decades. Students most likely to leave after the second year of college shared the same demographics as those who left before that (Kuh, 2001/2002). Students who felt isolated were more likely to depart a college or university than even students who struggled academically (Tinto, 1993). Bean (2005) referred to this idea of students fitting in as “institutional fit.” As researchers explored how diverse students and institutions fit, they suggested that if colleges validated students’ cultures, then students could retain their prior cultural habits and would experience less stress while becoming members of the new college culture (Rendón, 1994; Rendón, Jalomo, & Nora, 2000). In order to understand why students from different cultures or backgrounds do not feel like they fit in, educators must learn about student perceptions of the college or university (Johnson Jr., 2000; Rendón, 1994; Rendón et al., 2000; Tinto, 1993).

Self-efficacy, a student’s belief about his or her ability to complete tasks, is one of the strongest predictors of student retention (Robbins et al., 2004). Students who are self-efficacious about college “believe in their ability to survive and adapt in an academic environment” (Bean, 2005, p. 220) and are more likely to persist. College students have exhibited diverse levels of self-efficacy in regards to ICTs (Cooper, 2006; Goode, 2010; He & Freeman, 2010; Hu, Zhang, Dai, & Zhang, 2012).

Certain uses of ICTs in higher education were positively associated with forms of educationally effective practices such as active and collaborative learning, student-faculty interaction and academic challenge (Nelson Laird & Kuh, 2005) along with academic outcomes and student satisfaction (Astin, 1993). Gains in college, such as students' perceived levels of learning or development, correlated to students' use of ICTs (Strayhorn, 2006). However, some studies did not find correlations between the use of ICTs and student outcomes (Flowers et al., 2000). Many researchers have called for more studies of how students use ICTs in higher education, including how students transition to college (Timm & Junco, 2008; Wilber, 2008), because, "The reality... is that we do not know enough of the benefits or misperceptions of technology as they related to important student outcomes" (Nora & Snyder, 2008, p. 16).

Statement of the Problem

Higher education institutions continue to struggle with student persistence. In the United States, first-year students leave four-year colleges or universities at an average rate of almost 21.3% (Knapp, Kelly-Reid, & Ginder, 2012). Despite decades of research and theory development, educators are still working to understand why students leave an institution. Tinto's (1993) student departure model indicates that students who feel isolated, or who do not fit in, are more likely to depart a college or university than even students who struggle academically. In order to understand why students from different cultures or backgrounds do not feel like they fit in, educators must learn about student perceptions of the college or university environment (Johnson Jr., 2000; Rendón, 1994; Rendón et al., 2000; Tinto, 1993). Another theme in student retention theories is that students who are self-efficacious about college "believe in their ability to survive and adapt in an academic environment" (Bean, 2005, p. 220) and, thus, are more likely to persist.

Certain uses of ICTs in higher education are positively associated with forms of engagement, academic outcomes, and students' perceived learning or development (Astin, 1993; Nelson Laird & Kuh, 2005; Strayhorn, 2006). Yet, not enough is known enough about how ICTs relate to important student outcomes such as achievement, perception and persistence (Nora & Snyder, 2008). Research demonstrates that not all college students experience self-efficacy in regards to ICTs, but scholars have not explored connections between a student's self-efficacy

with ICTs and his or her persistence at a university (Cooper, 2006; Goode, 2010; He & Freeman, 2010; Hu et al., 2012).

New literacies is a developing concept that explores how technology transforms what it means to be literate, to include defining how socially identifiable groups use ICTs as part of that group's social or new literacy practices (Lankshear & Knobel, 2007). Wilber (2008), after reviewing existing research about how college students use ICTs, noted that when researchers focus too closely on ICTs as tools, they lose "information about the ways in which these tools shift the literacy practices of students" (p. 573).

Existing research predominantly constrains the study of ICTs used by students in higher education to their use as tools. Despite the integration of ICTs into students' personal and academic lives, little formal research exists that may provide insight into how students perceive their experience with ICTs within the culture of their colleges or universities. It is possible that, by treating ICTs as tools rather than as social practices, researchers are unable to properly study the role that ICTs play in student experiences at college.

Purpose of the Study

The purpose of this study was to identify the essence of first-year college students' experiences with ICTs in higher education. Students enter college with a wide variety of ICT competencies and encounter many new ICTs while in college (Goode, 2010). However, educators still need a better understanding of how students use ICTs in higher education, including in their transition to college (Timm & Junco, 2008; Wilber, 2008). While research indicates that students with higher self-efficacy are more likely to persist in college (Bean, 2005), current research makes few connections between students' self-efficacy with ICTs and persistence (Ching et al., 2005). Student retention theories also recognize that students who feel that they fit in at a college are more likely to persist (Tinto, 1993). Again, current research makes few connections between ICTs and how a student fits in at a college; not enough is known about how ICTs relate to important student outcomes such as achievement, perception and persistence (Nora & Snyder, 2008).

Using a phenomenological framework, I sought to understand the essence of the common, shared experience first-year students have with ICTs in higher education (Patton, 2002). Phenomenology has particular value in regards to studying ICTs in higher education,

because its methods permit the researcher to ask a participant to explain his or her actions and beliefs and what meaning she or he places on the phenomenon being studied (Polkinghorne, 1989). In this study, I explored ICTs within the developing concept of new literacies. It is hoped by studying ICTs as social practices, rather than tools, new insights can be learned about the role ICTs play in college cultural environments. When studying institutional fit, Kuh wondered if there were occasions when an institution should consider modifying, “certain of its cultural properties to respond to the changing characteristics, needs, learning styles, and interests of students” (2001/2002, p. 28). By understanding how students experience ICTs, this study provides insight into whether reconceptualizing ICTs as new literacies with social practices can offer educators and administrators opportunities to improve the institutional fit for incoming students, including the possibility of modifying the college’s cultural properties in response to student needs and experiences with ICTs.

Research Question

The following research question guided this phenomenological study: How do first-year college students experience using Information and Communication Technologies (ICTs) in the higher education environment?

Significance of the Study

Despite ICTs being common on college and university campuses for more than a decade, scholars are calling for a better understanding of how students use ICTs in higher education, including in their transition to college (Timm & Junco, 2008; Wilber, 2008). Additionally, researchers in the area of student retention call for educators to understand how their students perceive the college’s cultural environment so as to help students fit in at an institution and persist at that institution (Johnson Jr., 2000; Rendón et al., 2000).

This study contributes to the understanding of how students perceive the college’s cultural environment with specific attention being paid to the role ICTs play in that environment. This understanding will help educators, student services professionals, and administrators at colleges design courses and services that integrate ICTs for first-year students who exist all along the digital spectrum. It is hoped by knowing and meeting students’ needs, more first-year students will feel as though they fit in and will stay at the college or university.

This study also contributes to the developing concept of new literacies. Leaders in the developing field of new literacies have called for researchers in disparate fields to collaboratively contribute to “the important task of understanding the extraordinary complexities that now define literacy as it continually changes and becomes richer and more complex” (Leu et al., 2013, p. 1157). Wilber (2008) identified college students as, “a key population for research aimed at understanding new literacies...while little research has been done through this lens to date” (p. 576). It is hoped that by developing an understanding of the common, shared experiences of ICTs by first-year college students, this study will help define new literacies and provide other researchers in higher education with a new lens through which to observe their work with college students.

Researcher’s Interest in the Topic

As an academic librarian at a large public university, I regularly interact at the help desk or in the classroom with students who demonstrate a diversity of skills and responses to ICTs. Observing the disparate student behaviors when encountering new ICTs both puzzles and fascinates me. Some students are dismissive, as if their time is being wasted learning something so obvious. Some students apply what they already know and unlock the new ICT on their own. Other students turn to classmates for peer assistance. Some students ask their instructor or myself for guidance, as if seeking the authoritative answer. Finally, some students retreat once they hit a wall. These students sit quietly, their screens set on the last page they used as they wait out the clock and can leave.

With so many academic resources online, particularly library resources, I wonder how interacting with so many ICTs affects the students, particularly in their ability to succeed in college. When I see students struggle with or appear apathetic towards ICTs, I wonder if they need help in ways that they cannot (or do not) readily express. When I can only observe behavior, the diversity of their actions only adds layers of confusion. I was hoping, through this study, to develop a more complete understanding of why students respond the way they do to ICTs. With this understanding, I plan to modify the ways in which I engage with students when they are using ICTs in order to encourage student success.

Definitions of Terms

Deictic—derived from *deixis*, “a word used by linguists and others (Fillmore, 1972; Murphy, 1986) for words such as *now*, *today*, *here*, *there*, *go*, and *come*. These are words whose meaning change quickly depending on the time or space in which they are uttered” (Leu, Kinzer, Coiro, & Cammack, 2004, p. 1591).

Digital spectrum— the range in access to the Internet and ICTs, and how, when, and why people use the Internet and other ICTs (Lenhart & Horrigan, 2003)

discourse—small “d” discourses are “language in use, or connected stretches of language that make sense, like conversations, stories, reports, arguments, essays, and so forth. So, ‘discourse’ is part of ‘Discourse’” (Gee, 2012, p. 151).

Discourse—

“‘Discourse’ with a big ‘D’ is always more than just language...A Discourse with a capital ‘D’ is composed of distinctive ways of speaking/listening and often, too, writing/reading *coupled* with distinctive ways of acting, interacting, valuing, feeling, dressing, thinking, believing with other people and with various objects, tools, and technologies, so as to enact specific socially recognizable identities engaged in specific socially recognizable activities.” (Gee, 2012, pp. 151-152)

Ethos—values, priorities, norms, and sensibilities that are part of a society’s literacy practices (Lankshear & Knobel, 2007).

First-year students—those students attending college for the first time and who have not finished a semester of college at this or another university.

Information and Communication Technologies (ICTs)— technologies that include, but are not limited to, computers and other devices that can be used to do the following with information:

- Communicate
- Search for
- Create
- Edit
- Store
- Share

Locus of Control—

“The belief in one’s ability to influence life events. Someone who accepts both positive and negative outcomes and consequences as the result of their own behaviour is considered ‘internal’ whereas someone who considers others to have influence over both positive (luck) and negative (other’s fault) results is considered ‘external.’” (C. A. Smith & Mihans II, 2009, p. 63)

new literacies—literacy practices developed in response to ICTs and the internet. They are social (Gee, 2012; Street, 2008), deictic (Leu et al., 2013), and mobilize new ethos (Lankshear & Knobel, 2007).

new literacies theories (aka lowercase theories)—“explore a specific area of new literacies and/or new technology...explore a focused disciplinary base...or a distinctive conceptual approach” (Leu et al., 2013, p. 1157).

New Literacies Theory (aka uppercase theory)—“the broader, more inclusive concept, includes those common findings emerging across multiple, lowercase theories” (Leu et al., 2013, p. 1157).

Retention—“the proportion of students who remain enrolled at the same institution from year to year” (Hagedorn, 2012, p. 91).

Self-efficacy—when a person undertakes and assuredly performs activities that she or he judges himself or herself capable of managing (Bandura, 1982).

Summary

The role that ICTs play in how students perceive the academic culture of their colleges is still largely unknown. We know what ICTs students use, and to a certain extent, how students use those ICTs (Dahlstrom, de Boor, Grunwald, & Vockley, 2011; Jones, Johnson-Yale, Millermaier, & Pérez, 2008). Students with access to ICTs, however, do not necessarily have self-efficacy when using those ICTs. Additionally, educators know little about the role ICTs play in students’ perception of the university culture and how students fit in to that culture. Educators know that student self-efficacy and a sense of fitting in both contribute to student retention (Bean, 2005; Tinto, 1993).

The frame of new literacies provides an opportunity to study ICTs as part of a social practice (Lankshear & Knobel, 2007). A phenomenological study of first-year students’

experiences with ICTs will provide insight into both student self-efficacy and institutional fit. This insight may be used by educators to create services and learning experiences that more effectively integrate ICTs for first-year students in order to support student success and retention.

Chapter 2 - Literature Review

The research question and methodology for this study were developed based upon three fields of study. The use of information and communication technologies (ICTs) in higher education and questions about student access to and ability to use ICTs provide the context of the study. The developing concept of new literacies provides a theoretical framework to guide how the question may be asked and analyzed. Finally, the area of student retention offers insight into why the experiences of first-year students are of value for study in higher education.

Information and Communication Technologies in Higher Education

Students attending colleges and universities enter an environment where ICTs are ubiquitous. Several organizations and researchers, including EDUCAUSE and the Pew Internet & American Life Project, track how students use ICTs through regular, if not annual, studies (Caruso & Salaway, 2007; Dahlstrom, de Boor, Grunwald, & Vockley, 2011; Jones, Johnson-Yale, Millermaier, & Seoane Perez, 2009; Kvavik & Caruso, 2005; Madden & Jones, 2002; S. D. Smith & Caruso, 2011). When read for historical perspective and context, the most striking aspect of these reports is the fluidity and dynamism of ICTs and how students used them. Some ICTs, like e-mail, remained a constant presence over the years. Meanwhile, new ICTs, like e-readers, emerged and were added to the mass of technologies. Students shifted their focus from one ICT to another as access and convenience dictated.

Merely a decade ago, in 2002, only half of college students reported using the Internet before college (Madden & Jones, 2002). By 2009, a majority (87%) of college students reported using the Internet for at least six years (Jones, Johnson-Yale, Millermaier, & Seoane Perez, 2009). Not only were students active online, using e-mail, instant messaging, and social networking sites like Facebook, they also were more likely than the broader population in the United States to pay their bills online, to write a weblog (blog), and to play games online (Jones, Johnson-Yale, Millermaier, & Seoane Perez, 2009). Academically, students used email to contact their professors and classmates, enrolled in online courses, used course websites, and searched for information online via library resources or search engines (Jones, Johnson-Yale, Millermaier, & Pérez, 2008). A majority of students reported owning a dozen technology

devices, from laptops to smartphones to printers, and along with these devices, the average student used approximately 21 different kinds of software applications (Dahlstrom, de Boor, Grunwald, & Vockley, 2011).

Yet, with all of those devices, not even half of students participating in a survey reported that the ICTs helped them be more productive, only one third of students felt more connected, and, again, only one third of students found that ICTs made learning more engaging and relevant (Dahlstrom, de Boor, Grunwald, & Vockley, 2011). Additionally, some students reported lacking confidence in their ability to use certain core software, such as spreadsheets, presentation software, course management systems, and word processing software (Dahlstrom, de Boor, Grunwald, & Vockley, 2011). Only half of the students in a 2010 EDUCAUSE survey reported entering college feeling prepared to use ICTs in college; this, of course, means that half of the students entering college did not feel prepared to use them (S. D. Smith & Caruso, 2011).

As the students themselves indicated, simply having access to a wide variety of ICTs was not equated with having high levels of competence across a wide range of applications. Teens who participated in a Pew Internet & American Life Project study said that their writing online (texting, email, instant messaging) had little impact on their writing for school (Lenhart, Arafeh, Smith, & Macgill, 2008). These same students also believed that more in-class computer-based writing instruction would improve their writing. Kirkwood and Price (2005), in a study of online students in the United Kingdom, found that familiarity with the use of email did not imply expertise in rigorous online debate and discussion. In addition to mixed competency levels, students as a group also expressed a range of attitudes about ICTs. Duffelmeyer's (2000) study of students in a first-year composition course applied critical literacy to how students "support, challenge, or even demonstrate an awareness of prevailing discourses about technology" (p. 290). The study revealed three types of attitudes from the students about ICTs: I love it (hegemonic); I hate it but have to use it (oppositional, lack of agency); or I like it, but have reservations (negotiated). While Duffelmeyer focused on the students' application of critical literacy, her research provided insight into the diversity of student attitudes about technology.

There is extensive and rich research examining ICTs in higher education. Researchers surveyed attitudes about ICTs by particular college student populations such as Hispanic students (Slate, Manuel, & Brinson, 2002) and students at an American Pacific island university (Inoue, 2007). Researchers studied college students' use of specific ICTs such as the Internet (Anderson,

2001; Selwyn, 2008), Facebook (Hyllegard, Ogle, Yan, & Reitz, 2011), instant messaging (Junco & Cotten, 2011), and blogging (Nackerud & Scaletta, 2008). Each study provided another piece of insight, yet the study results have been so disparate that it is difficult to draw substantive conclusions about the use of ICTs in general by college students.

ICTs have also been studied in regards to retention, engagement, and student development. Astin (1993) found that the number of hours per week a student used a personal computer had positive effects on both academic outcomes and student satisfaction. More recently, Laird and Kuh (2005) found that certain uses of ICTs in higher education were positively associated with engagement through educationally effective practices such as active and collaborative learning, student-faculty interaction, and academic challenge. A study of students' self-reported use of ICTs found relationships between the use of those ICTs and the students' overall gains in college, such as their perceived level of learning or development (Strayhorn, 2006). Not all researchers agree, however, that there are positive correlations between use of ICTs and student outcomes. Flowers, Pascarella, and Pierson (2000) found little connection between students' computer or email use with four student outcomes: critical thinking, reading comprehension, mathematics, and composite cognitive development. Nora and Snyder's (2008) review of the literature related to ICTs in higher education and their impact on student achievement, perceptions, and persistence found such mixed results that they concluded, "The reality... is that we do not know enough of the benefits or misperceptions of technology as they related to important student outcomes" (p. 16).

Digital Spectrum

Socioeconomic background, gender, race, and age have all been identified as factors that may contribute to a student's ICT use or digital literacy. The United States National Telecommunications and Information Administration published the first in a series of reports about access to the Internet and computers in 1995. The initial report revealed that household access to a computer and the Internet, or lack thereof, was correlated to certain socioeconomic conditions: race, income, education, sex, age, household status (two parent families with children, single parent families, households without children) and geographic location (United States National Telecommunications and Information Administration, 1995). The rural poor, in particular Native American, African American, and Hispanic households, were overwhelmingly

less likely to own a computer or to have modem access to the Internet than urban, European American households (United States National Telecommunications and Information Administration, 1995). Other groups with low access rates were young households (under 25 years old), senior citizens, and those with lower education levels (United States National Telecommunications and Information Administration, 1995).

"Digital divide" is a common term describing the gap that exists when computing and Internet resources are unevenly accessible to members of a population. As technology has advanced, some researchers prefer the term "digital spectrum" to more accurately describe the range in access to the Internet and other ICTS and how, when, and why people use the Internet and other ICTs (Lenhart & Horrigan, 2003). Although many authors have continued to use the term "digital divide," this study will use the more expansive "digital spectrum." A major caveat to the discussion of the digital spectrum and socioeconomic groups is that, while the findings regarding one particular socioeconomic demographic may have been reported as a whole, one individual may claim membership to many groups. For example, a report may generalize that Hispanics or African Americans have lower Internet connectivity than European Americans or Asians, but an African American professional with a Bachelor's degree or higher with an income of over \$70,000 is as likely to be as connected as a European American professional with the same education and annual income (Lenhart & Horrigan, 2003).

Within the broad spectrum of undergraduate students, research indicates that how students use ICTs and their confidence using them varies, frequently along the lines of gender or socioeconomic status. For instance, multiple studies found that male students have higher levels of self-efficacy and confidence when using the Internet and other ICTs than do female students (Cooper, 2006; Goode, 2010; He & Freeman, 2010; Hu et al., 2012). Researchers suggested that this has less to do with the ability to use ICTs (Hargittai & Shafer, 2006) and more to do with how frequently students used ICTs, with male students using them more (Ching et al., 2005; He & Freeman, 2010). When reading the literature about college students and ICTs, a researcher can almost always find a study with findings that counter the findings from another article just read. In this case, a study of college students in the United Kingdom found that female students were more likely to search the Internet for information about their university studies or assignments and that all students (male and female) reported feeling competent when using the Internet (Selwyn, 2008).

Students from families with high incomes used a wider spectrum of technology more frequently (Ching et al., 2005) and used ICTs for more research and evaluative work than students from lower income families or those who attended schools in lower income areas (Cuban, Kirkpatrick, & Peck, 2001; Goode, 2010; Goode, 2004). A 2000 study of first-year students seems to contradict those studies, finding that background factors, including gender, race, or socioeconomic status did not influence computer use at four-year colleges (Flowers et al., 2000). However, within the same study, being female or African American negatively influenced the use of e-mail by first-year students (Flowers et al., 2000).

Many studies found disparities by race with regard to use of or competency with ICTs and indicated that those disparities correlated to specific ICTs, rather than to the broad spectrum of ICTs. A study by Flowers and Zhang (2003) found that a high percentage of American Indian/Alaskan Native students reported often searching the Internet for information for homework or research (83.4%), followed by Native Hawaiian/Pacific Islander, then Asian, African American, European American, and Hispanic (71.8%) students. Meanwhile, Lenhart, et al. (2008) found that use of computers for writing by teenagers correlated with a student's race, "One in five white teens (19%) typically do their school writing on a computer, compared with one in ten blacks (11%) and English-speaking Hispanics (9%)" (p. 16). A study to identify predictors of ICT use by college students did not find that a student's race or ethnicity was a predicting factor (Ching et al., 2005). But the researchers also acknowledged that socioeconomic status and race have been frequently confounded and that, while 46% of their study sample was comprised of students who self-identified as African American, Hispanic, Asian, or multiethnic, there were not enough students within each ethnicity to identify statistically significant differences (Ching et al., 2005). In many studies, socioeconomic status seemed to play as important a role in ICT use as race. Goode's (2004; 2010) studies of students who lived in communities on the West coast found that students from high schools that served predominantly students of color and low income students had more shallow and rote ICT skills than students from predominantly European American, Asian, and/or higher income schools. This differential use of technology carried forward to their university experiences, leaving some students scrambling to achieve the benefits from ICTs that their classmates experienced.

A recent study of how college students use communication technologies, such as cell phones or smartphones, found that students who are African American, male, and/or students

from the lowest parental income levels were less likely to own a cell phone than students who were European American, female, and in upper income brackets (Junco et al., 2010). However, the same study noted that students who are female, African American and/or from a high household income bracket were positively associated with the number of text messages sent in a week. A Pew Internet & American Life report regarding mobile technologies revealed slightly different results for the wider population in the United States (Zickuhr & Smith, 2012). For instance, African Americans and Spanish-speaking Hispanics were as likely to own mobile phones as were European Americans and used their phones for a wider range of activities. However, still registering the digital spectrum, more African Americans and Hispanics had access to the Internet only on their smartphones than did European Americans, possibly reflecting lower rates of high speed Internet access in the homes of African Americans and Hispanics (Zickuhr & Smith, 2012).

A literature review conducted in the database Education Fulltext using terms such as *nontraditional college students*, *age differences*, *computers*, or *Internet* resulted in few articles addressing nontraditional, undergraduate students (25 years of age or older) and ICTs outside of the context of distance education. An exception was an Australian study of mature students (45 years of age or older) and low socioeconomic status students that found these students would have found value in a specialized computer course, especially as mature students over the age of 45 reported limited computer skills (Tones, Fraser, Elder, & White, 2009). Another study asked students in a community college, freshman-level course to reflect on their technology experiences (B. Q. Smith, 2004). The students ranged in age from 20-54 and their experiences were wide-ranging, from students who wanted to avoid the complications of ICTs, students who wished they had taken opportunities in high school to learn more about computers, students who actively sought out ICTs because of perceived advantages, and students who associated ICTs with specific work-related tasks or skills. Other research about non-traditional students focused on topics such as graduate students and distance programs (Lake & Pushchak, 2007), lessons learned developing an undergraduate distance program (with no mention of student digital literacies) (Rodriquez & Nash, 2004), and transition and engagement issues for nontraditional students (Gilardi & Guglielmetti, 2011; Wyatt, 2011).

The most striking trend that arises from a review of the digital spectrum literature is the diversity of findings. Some studies contradicted each other; other studies reached similar

conclusions. This may be partially accounted for by the fact that the studies occurred over a span of years that saw rapid changes in ICTs. Additionally, due to the diverse and dynamic nature of ICTs, almost every study seemed to be examining either different ICTs or different uses of ICTs. Perhaps the only certain conclusion that can be drawn from the literature is that within any population, every individual is going to have different access to and uses for ICTs. Every educator must be aware that, within one classroom, there will likely be students from all points of the digital spectrum.

ICTs and K-12 Education

When studying first-year college students, particularly students who are entering college soon after graduating from high school, it is natural to look back at their grade school and high school experiences to learn how those experiences may have affected their use of ICTs. The literature surrounding K-12 education and technology highlights the digital inequities inherent within a digital spectrum. These inequalities rarely seem to stem solely from technology itself but have old roots in the socioeconomic status of the communities in which the schools reside (Attewell, 2001; Cuban, Kirkpatrick, & Peck, 2001; Goode, 2004; Huang & Russell, 2006; Natriello, 2001).

Due to the presence of computers in schools connected to the Internet, K-12 teachers and administrators reported that their students had Internet access, thus bridging the digital divide. However, researchers questioned the theory that the presence of these computers in the schools translated to improved ICT skills for students (Cuban et al., 2001; Goode, 2004; Levin & Arafeh, 2002; Selwyn, 2006). For one thing, students experienced restrictions on their ability to access the computers because the computers were in labs that were locked over lunch hours or after school (Goode, 2004). When they were able to access the Internet, blocking and filtering software limited what they could access (Levin & Arafeh, 2002; Selwyn, 2006). Moreover, teachers did not always incorporate the Internet into class assignments--some out of recognition that all students did not have easy access to a computer or the Internet (Levin & Arafeh, 2002). Sometimes, teachers may not have been comfortable with technology themselves, may not have had adequate tech support at school, or may simply not have had time to plan for effective inclusion of technology in the classroom (Cuban et al., 2001). Teachers also used the Internet in what students perceived as an un-engaging or rote manner (Levin & Arafeh, 2002). When school

districts with minimal financial resources “purchase computers to appear current but lack the basic staff, training, facilities, and operating budgets to support appropriate computer use, the overall education effort may be diminished” (Natriello, 2001, p. 261).

K-12 students may also have had access to computers and the Internet at home. Once again, socioeconomic conditions affected the quality of their access. According to Clark, Demont-Heinrich, and Webber (2005), lower income parents and/or parents whose jobs did not include an IT component were less likely to have a computer or the Internet at home for their children. This research suggested that, although parents expressed valuing ICT skills for their children, if parents did not have ICT skills they may not have been able to evaluate if their children developed those skills. Additionally, the parents, for a variety of reasons including their own lack of ICT skills, may not have been able to help their children develop these skills, even if they offered computer and Internet access at home (Clark, Demont-Heinrich, & Webber, 2005). Additionally, Attewell (2001) commented on the inequality of computer use among children at school and at home, “Computing for already-disadvantaged children may be dominated by games at home and unsupervised drill-and-practice or games at school, while affluent children enjoy educationally richer fare with more adult involvement” (p. 257).

The effect that technology access has on academic success for K-12 students is unclear (Benson et al., 2002). Researchers have attempted to tie standardized test scores to computer/student ratios (Huang & Russell, 2006) and to contrast the computing course offerings between schools (Goode, 2004). But, with so many variables affecting student performance (e.g., socioeconomic, teaching quality, school environment, home environment, or academic inclination), it has been difficult to parse out the precise role technology plays.

Student access to and use of ICTs in their K-12 educational experience has been unequal. The clear digital spectrum that exists in K-12 schools may partially account for students who report feeling unprepared to use ICTs when they enter college. Educators in higher education cannot assume that all students will be equally prepared to use ICTs when entering college.

Summary: ICTs in Education

Two central themes surface from the review of the literature about ICTs in education. The first is that a digital spectrum exists in terms of student access to, use of, and competency with ICTs. Educators should be aware that all students will not be equally competent with, nor

have access to, the same ICTs. This leads to the question: With such a diversity of experience, competencies, and attitudes, are there any common elements to how first-year students experience ICTs? The second central theme is that the studies focused on ICTs as tools. Students either used certain tools or did not. Each tool is unique and competencies do not always transfer. However, as will be discussed more thoroughly below in regards to new literacies, we may learn more about college students and ICTs if we stop thinking of ICTs as discrete tools and instead conceive of them as part of new literacies within social practices.

New Literacies

In this section, I will review central tenets of new literacies in order to clarify the relationship between ICTs and new literacies and will discuss the relevance of new literacies to student retention in higher education. New Literacies is a developing theory that explores how technology transforms what it means to be literate. There are several schools of thought related to this concept, including: New Literacy Studies (Street, 2003; Street, 2008) and New Literacies Perspective (Coiro, Knobel, Lankshear, & Leu, 2008). This study will refer to work from researchers across the field. Researchers recently proposed a protocol to aid in distinguishing between focused studies in new literacies and the overarching theory. This protocol uses lowercase “new literacies” to reference “a specific area of new literacies and/or new technology...a focused disciplinary base...or a distinctive cultural approach” (Leu et al., 2013, p. 1157). Uppercase New Literacies, then, refers to the developing theory and “benefits from work taking place in the multiple, lowercase dimensions of literacies by looking for what appear to be the most common and consistent patterns being found in lowercase theories and lines of research” (Leu et al., 2013, p. 1157). I will follow the protocol in this study: references to the developing theory will be capitalized, and all other uses of the term will be lowercase.

While New Literacies as a theory is not yet formally defined, there are three common tenets to which many researchers in the field refer. First, literacy is a social practice (Gee, 2012; Street, 2008). Second, new literacies are deictic (Leu et al., 2013). And third, new literacies mobilize new values or ethos in how people practice literacy (Lankshear & Knobel, 2007).

Literacy as a Social Practice

New literacies defines literacy as a social practice, one in which texts only have meaning within the context of a society (Lankshear & Knobel, 2007; Street, 2003). That is, “Different

kinds of text require ‘somewhat different backgrounds and somewhat different skills’ if they are to be read (i.e. read meaningfully)” (Lankshear & Knobel, 2007, p. 2). For instance, a book of knitting patterns will baffle someone who has never knit before. As anyone who has read Shakespeare knows, his vivid language becomes more meaningful if the reader is also aware of the social symbolisms Shakespeare used that were drawn from Greek or Roman mythology, Judeo-Christian beliefs, and the politics and culture of Shakespeare’s England. By considering literacies as part of a social practice, sociocultural theorists, like Street (2008) and Gee (2012), expanded literacy from alphabetic texts to multimodal ways of making meaning. Street (2008) described multimodalities and how modes beyond text, such as, “visual, gestural, kinesthetic, three-dimensional—play their role in key communication practices” (pp. 5-6). Gee (2012) explained how members of a social group or community of practice are fluent in a set of common knowledge and practices, or Discourses. Because Gee’s work played a foundational role in how researchers within new literacies have defined literacy, his Discourses require a more explicit review.

Gee (2012) took care to differentiate between discourse (spelled with a lowercase “d”) and Discourse, which he spells with an uppercase “D.” He explained:

I will use “discourse” with a little “d” for language in use or connected stretches of language that makes sense like conversations, stories, reports, arguments, essays, and so forth. So, “discourse” is part of “Discourse.” Discourse with a big “D” is always more than just language. (p. 151)

According to Gee (2012),

A Discourse is a socially accepted association among ways of using language and other symbolic expressions, of thinking, feeling, believing, valuing, and acting, as well as using various tools, technologies or props that can be used to identify oneself as a member of a socially meaningful group or ‘social network’ to signal (that one is playing) a socially meaningful ‘role’, or to signal that one is filling a social niche in a distinctively recognizable fashion. (p. 158)

Within Discourses, there are two key concepts: multimodal ways of communicating or making meaning and being a member of a socially meaningful group. A socially meaningful group may be a family, a religion, a profession, a social movement (feminism), a subculture (see: Haenfler, 2004), fans of a sports team, or doctoral students from around the world who form an online

support group via Twitter. Each of these groups has a unique way of making meaning: the rituals of a religious holiday, the uniform of a profession, the tattoos of a subculture, or the use of a specific hash tag (#phdchat) when Tweeting to ensure other doctoral students can participate in the conversation. One person may exist within and among many societies and move between multiple Discourses, some of which overlap and some of which conflict.

According to Gee (2012), a person has a primary Discourse, typically learned in the home. This primary Discourse forms who that person is in his or her “every day” life. Subsequent Discourses in a person’s life are referred to as secondary Discourses. A person relies upon both types of Discourses when interpreting texts, greeting someone, or communicating information. The social context helps determine the appropriate manner in which this is done. For example, colleagues who study *Tae Kwon Do* together will bow before sparring in the *dojo* but shake hands before sitting at a conference table.

A newcomer to a society may become fluent in that society's Discourse in two ways: acquisition and learning (Gee, 2012). Acquisition occurs when existing members of a society model behavior that the neophyte observes and attempts to emulate. And, learning occurs when someone in the role of a teacher role explicitly tells the student what was to be done. Gee (1990) suggested, "We are better at performing what we acquire, but we consciously know more about what we have learned.... Discourses are mastered through *acquisition* not *learning* (p. 146. Emphasis in the original).

Some families incorporate secondary Discourses into their primary Discourses (Gee, 2012). Gee explained that a family who places high value on their religious beliefs will incorporate evening prayers into their home. Or, a parent who values education will incorporate education related literacies, such as analyzing stories or math puzzles, into their children’s primary Discourses. When a secondary Discourse complements a person’s primary Discourse, it is simpler for that person to acquire the secondary Discourse (Gee, 2012). A child raised with education related literacies may find that starting school and talking about themes in a story already makes sense because it was something his or her parents taught the child to do at home. When a person’s primary Discourse conflicts with a secondary Discourse, perhaps because of social values, there may be a struggle as the person realigns her or his primary Discourse or perhaps finds him or herself existing on the periphery of the secondary Discourse. However, Gee noted that those individuals whose primary Discourses do not completely mesh with a dominant

culture's Discourse, such as first generation students attending college, might be enactors of social change. Social change is achieved when the individual succeeds within the dominant culture's Discourse but infuses his or her experience within the secondary Discourse with aspects of his or her primary Discourse (Gee, 2012).

Some people may never become members of a Discourse. In higher education, this can mean that a student leaves the college. The concept that someone may not become a member of a Discourse hearkens to Kuh's (2001/2002) research into student retention that revealed that some students leave an institution because they cannot "successfully navigate the distance between their cultures of origin and the institution's dominant culture" (p. 28). Additionally, the premise of literacies as social practices, or Discourses, carries hints of identity development theories commonly referenced in the student development literature. Josselson (2005) noted, "Identity is what we make of ourselves within a society that is making something of use. Identity 'makes sense' only within the context of a particular social and historical time" (p. 191). Recognizing common ground between theories related to ICTs and theories of student retention and development, that identity and meaning are formed in the context of a society, offers the researcher reassurance that bridging theories of technology and theories of student retention and development is realistic.

The concept of literacies as social practices that incorporate multimodal ways of making and communicating meaning opens the door to associating ICTs with new literacies. The advent of technology, particularly the Internet, transforms how text works and raises the question, "Does literacy mean comprehension of print or comprehension of a message that has a permanence in ways that a nonrecorded oral message does not?" (Leu, Kinzer, Coiro, & Cammack, 2004, p. 1583). If applying the sociocultural concept that literacy is social practice, then what is defined as literacy should reflect a society's Discourse. The extensive research conducted on the use of multiple ICTs in higher education indicates that ICTs are integrated into the Discourse of higher education in the United States. If members of the higher education community use ICTs to think (read e-books, write papers with word processing programs, discuss ideas on course management discussion boards), feel (emote on Twitter), believe (participate in an e-mail list discussing evolution), value ("friend" the university's LGBTQ center on Facebook), and act (take notes on a tablet), then surely those ICTs elicit a new literacy.

New Literacies are Deictic

The term deictic comes from *deixis*, “a word used by linguists and others (Fillmore, 1972; Murphy, 1986) for words such as *now, today, here, there, go, and come*. These are words whose meaning change quickly depending on the time or space in which they are uttered” (Leu et al., 2004, p. 1591). In reference to the new literacies of ICTs, deictic means that new literacy practices only exist in a particular time and context. Each new ICT or upgrade to an existing ICT requires new literacy practices (Wilber, 2008). Consider word processing software. Though it has been a tool that has been available for decades, each upgrade to the software creates new ways to format and to encode information, meaning that the word processing software of today is not the word processing software of ten years ago. Furthermore, the new literacies elicited by word processing have transformed alongside the technology. Defining new literacies as deictic reminds researchers that literacy practices are no longer stable for years but that they continuously and rapidly change (Leu et al., 2013). Admittedly, this can be an unsettling reality with the potential to overwhelm researchers trying to define new literacies and their practices.

However, this reality encourages the researcher to study the underlying essences of new literacies. If new literacies are deictic, then attempting to define the new literacy elicited by a specific ICT almost guarantees that the definition will only be a snapshot from a particular time and context and will almost surely be outdated by the time analysis is completed. If a researcher instead asks how people experience the phenomenon of these new literacies, without focusing on a particular ICT, it is possible that the shared human experience will provide a stable insight into new literacies. If there are always ICTs, then individuals are always adjusting to the new literacy practices elicited by the ICTs, and the way in which they experience those changes must have a common essence.

New Literacies, New Ethos

Another approach to defining new literacies is to consider what sets them apart from other literacies. Clearly, if researchers were to only rely on the temporal definition of “new,” the onslaught of new ICTs would make studying them impractical. Fortunately, Lankshear and Knobel (2007) offered the theory that what makes a literacy “new” is that it both incorporates new technologies and is part of an ethos or paradigm shift. The ethos of new literacies is more “‘participatory,’ ‘collaborative,’ and ‘distributed’” and “less ‘expert-dominated’ than

conventional literacies” (Lankshear & Knobel, 2007, p. 9). That is, new literacies reflect an insider mindset (Lankshear & Knobel, 2007). Conventional literacies, according to Lankshear and Knobel, operate more within the producer-consumer ethos. The producer-consumer ethos is seen in publishing (text, music, or software) where the information is compiled, produced, and distributed by an “expert” to readers or listeners who in many cases only have the option to consume the information. New literacies encourage collaboration and participation, as may be seen with blogs (Mortensen, 2008), fan fiction sites (Black, 2007; Ward Black, 2008), and learning management systems (Baskin & Anderson, 2008).

The intriguing aspect about the insider mindset of new literacies is that everyone is encouraged to be an insider. Gee (2007) described the insider mindset within the context of an affinity space, a website that anyone can visit, for a computer game, *Age of Mythology*. The website is comprised of a variety of sub-sites and resources, all designed to create and to share information about the game. While Gee explored an affinity space for a game, a quick search of the Internet brings to light affinity spaces for fans of television shows; sports enthusiasts, like marathon runners; knitters; chemistry students; and many other groups with common interests or endeavors. Gee (2007) detailed eleven features that define an affinity space (although he noted that all eleven features do not need to be present for a site to be considered an affinity space, just many of them):

1. People are brought together by a common endeavor, rather than by age, race, gender, or disability.
2. Experts and neophytes share the same space.
3. The affinity space may generate new content (maps, graphics, stories) related to the common endeavor.
4. The affinity space may change the content of the common endeavor based upon the reactions or activities of the members.
5. The affinity space encourages both in-depth (intensive) and extensive knowledge.
6. The affinity space encourages people to build their internal knowledge base and to share their own knowledge with others.
7. The affinity space encourages people to use knowledge found external to the space.
8. The affinity space supports tacit knowledge.

9. People may participate in the affinity space in many ways.
10. People may achieve status in the affinity space through many routes.
11. Leaders are resources, not bosses.

Gee (2007) expressed the belief that affinity spaces do not yet exist in the classroom. Whether that still holds true, the insider perspective of new literacies may already affect how students experience the use of ICTs in higher education outside of the classroom. Some students find or create academic affinity spaces. Chemicalforums.com is an example of an affinity space for students studying chemistry. The site provides strict guidelines about how students might seek help. For instance, a student cannot post asking for the solution to a question for an assignment. Instead, the student must show the work he or she already completed and describe what he or she did not understand. Only then will other members of the site step in and guide the student to a solution. And “guide” is the key word in this scenario. Students are not simply provided with an answer; instead, the postings operate as virtual tutoring sessions whereby the student participate in a series of questions, answers, and comments in order to solve the question. Knowing that affinity spaces such as Chemicalforums.com exist, fully embracing the new ethos of new literacies, how might this affect how students’ experiences using ICTs in higher education?

New Literacies Summary

When studying how first-year college students experience ICTs in higher education, it is expected that not all ICTs will elicit new literacies. For example, an enrollment management system, while online and subject to frequent upgrades and modifications, does not embody the new literacies ethos of being participatory or distributed. The information offered in the enrollment management system is controlled by a set group of people, and users cannot modify the information nor can they participate in a discussion about the content. However, the university environment is rife with many types of ICTs used personally and academically that elicit new literacies, if examined as more than just tools. Wilber (2008) noted that when researchers focus too closely on the tools, we lose “information about the ways in which these tools shift the literacy practices of students” (p. 573). New literacies offer a framework to researchers trying to understand how students use or engage with ICTs, how they bring with

them new literacy practices from other parts of their lives, and that, although sometimes ICTs are tools, they are also embedded in the social practice of the university community.

College Student Retention

The puzzle of why students stay at a college and why students leave a college has engaged researchers for decades. First-year students leave a four-year college or university at an average rate of almost 21.3% (Knapp, Kelly-Reid, & Ginder, 2012). Students most likely to leave after the second year of college share the same demographics as those who left before that (Kuh, 2001/2002). By studying why first-year students leave an institution, we may also gain insight into why students leave an institution later in their college careers. There are many aspects of a student's experience at a college or university that are posited as related to student retention. Bean (2005) identified nine themes, two of which may provide particular insight into how students use ICTs in higher education and retention: institutional fit and self-efficacy.

University Environment and Institutional Fit

Tinto's (1993) student departure theory holds as its central theme the need for each student to become a "competent member of the social and intellectual (academic) communities of the college" (p. 136). Students who felt isolated are more likely to depart a college or university, he suggested, than even students who struggled academically. Bean (2005) referred to this idea of students fitting in as "institutional fit." Tinto's early work (1987) placed the pressure to fit in on the students, describing the movement into college as a rite of passage that entails students leaving behind their old habits and taking on new ways of being in accordance with the higher education environment. However, in his later work, Tinto (1993) recommended that colleges and universities should do more to help students adapt to the university environment and to recognize the cultures and needs of students. Bean (2005) reinforced this idea by stating, "Where a student comes from affects how the student interacts with the institution and likelihood of survival" (p. 226). This is very similar to Gee's (2012) discussion of how a person's primary Discourses complements or is in tension with the secondary Discourses that person encounter.

Some theorists take the idea of institutional fit a step further and ask how a university should adapt to its students. Kuh (2001/2002) wondered, "Under what conditions, if any, and to what extent should an institution attempt to modify certain of its cultural properties to respond to the changing characteristics, needs, learning styles, and interests of students" (p. 28). As

researchers explore how diverse students and institutions fit, they re-examine Tinto's theory, questioning the acculturation/assimilation framework that still seems to call for students leaving behind their cultures in favor of the institution's culture (Rendón et al., 2000). Rendón (1994) proposed a validation model instead. This model suggests that cultures are not mutually exclusive; students can retain their prior cultural habits while becoming members of a new culture, as in college. According to Rendón, when a university validates a student's existing cultural habits, by supporting student groups for students of different races and ethnicities or by providing meeting space for non-traditional students, students find strength in their cultural habits and adapt to the new culture of the university with less stress.

Rendón's (1994) validation model shares sentiments with Gee's (2012) Discourses when Gee identified individuals from non-dominant Discourses as agents of change within dominant Discourses. By encouraging students to retain their cultural identities, those cultures may become part of the dominant Discourse. Johnson (2000), also critiquing Tinto's theory, suggested that colleges change with every student who enters; essentially, each student creates the community by being a part of it. This concept of individuals and colleges reacting to and acting upon each other has striking correlations with new literacies perspectives about how people and technologies interact: "New technologies shape and are shaped by social relations and practices" (Leander & Lewis, 2008, p. 57).

Despite existing research and theories, we are still learning why students leave an institution. One conclusion that Johnson (2000), Tinto (1993), Rendón (1994) and other researchers (Rendón et al., 2000) agree upon is that students make decisions to stay in or to leave a college in response to their perceptions of a college or university. Bean (2005) noted that a student does not leave a college because she or he is African American, but that the student may leave a college if she or he perceives it as a racist institution. Thus, if university educators want to understand why students leave, they must conduct research to learn how students perceive the university and their place within it.

Historically, research about college student retention and ICTs focused on the ICTs as tools. Despite extensive research, there are calls for a better understanding of how students use ICTs in higher education, including how students transition to college (Timm & Junco, 2008; Wilber, 2008). New literacies, by framing ICTs as being part of a social practice and embodying an insider ethos, offers a new context from which to ask students about their perceptions of ICTs.

Self-Efficacy

Self-efficacy, a student's belief about his or her ability to complete a task, is one of the strongest predictors of student retention (Robbins et al., 2004). A student will undertake an activity if she or he feels capable of completing it but will avoid those that she or he believes cannot be accomplished (Bandura, 1982). Students who are self-efficacious about college "believe in their ability to survive and adapt in an academic environment" (Bean, 2005, p. 220) and are more likely to persist. However, students who do not believe that they can complete an activity or meet a goal avoid it, hiding their lack of ability (Hsieh, Sullivan, & Guerra, 2007).

Research demonstrates that college students have diverse degrees of self-efficacy in regards to ICTs (Cooper, 2006; Goode, 2010; He & Freeman, 2010; Hu et al., 2012). Existing research, however, does not explore connections between a student's self-efficacy with ICTs and his or her persistence at a university. Additionally, the research treats self-efficacy with ICTs as something a student has or does not have, rather than something that can be developed. Yet self-efficacy increases through "personal accomplishments and feedback about those successes... an increase in self-efficacy raises educational goals and the likelihood of persistence" (Bean, 2005, p. 220). If students find resources like Gee's (2007) affinity spaces at the college, how might that affect their self-efficacy? As with the university environment, understanding how students perceive ICTs and their self-efficacy may provide insight into another aspect of student persistence.

Summary

Research in the fields of ICTs in education, new literacies, and literature related to college student retention provide the context in which this study is framed. While students use a variety of ICTs, their access to and self-efficacy when using the ICTs, varies along a digital spectrum. The developing concept of new literacies offers an alternative perspective to that of ICTs as tools. Instead, new literacies views ICTs as part of social practices, or new literacies. While recognizing the deictic nature of new literacies, researchers acknowledge that "new" is not a temporal definition, but rather, reflects a transition to a participatory, collaborative, and insider mindset. When studying ICTs in terms of student retention, self-efficacy and institutional fit are relevant themes. However, existing research makes few solid connections between student self-

efficacy with ICTs, nor the role ICTs can play in how a student perceives the culture of a college in terms of how that student fits in.

Chapter 3 - Methodology

The purpose of this study was to better understand first-year college students' experiences with information and communication technologies (ICTs) in higher education. This chapter discusses why a qualitative, phenomenological design was used to obtain this understanding the essence of the students' experiences. The process of participant selection, data collection, and data analysis is also outlined. This chapter also describes the researcher's role, the trustworthiness of the study, and the limitations in the study design.

Research Question

The following research question guided this study: How do first-year college students experience Information and Communication Technologies (ICTs) in the higher education environment?

Research Design

In this study, I employed phenomenology in order to gain insight into how first-year students experience ICTs in higher education. Qualitative research methods are ideal when a researcher needs a complex, detailed understanding of an issue or phenomenon (Creswell, 2007). In contrast, quantitative research is effective when the researcher want to measure and compare responses of many people to a set of previously identified concepts or theories (Patton, 2002). However, when a researcher's question is about what meaning people or social groups derive from an experience or problem, qualitative research methods are most appropriate (Creswell, 2007). The qualitative method of phenomenology encourages the participants to explain their actions and beliefs and what meaning they place on the phenomenon being studied (Polkinghorne, 1989).

A key aspect of phenomenology is its intent to understand how a participant perceives a phenomenon. Giorgi (1994) explained that perception of a reality might be more important than a more accurate or veracious account. The perception, after all, is what guides the participant's behavior or meaning making. For instance, students writing their first college research paper may resist when a librarian tries to teach them how to use library databases for their research. These students insist that they needed printed resources, even if the assignment does not indicate this.

Upon further discussion, students reveal that their instructor told the class they could not use Internet resources. Some students perceive this to include anything online when, in reality, the instructor meant students needed to use academic resources, like the library databases. In such cases, the students behave in accordance to their perception of the reality.

In regards to this study, several researchers in the area of student retention agree that students' decisions to stay or to leave a university are in response to how the students perceive the institution (Johnson Jr., 2000; Rendón et al., 2000; Tinto, 1993). As discussed in earlier chapters, we do not know enough about students' experiences with ICTs in higher education. In this phenomenological study, students were encouraged to explain their use of ICTs in the higher education context.

Phenomenology coalesces the perspectives of several people who experienced a phenomenon into an understanding of the common, shared experience (Creswell, 2007; Flick, 2007). This common, shared experience is then pared down to an essence, or essences, that would be understood by anyone who experienced the phenomenon, no matter the particularities of an individual's experience (Patton, 2002). This aspect of phenomenology has particular value in regards to studying ICTs in higher education because of the sheer diversity of ICTs and of the students who may (or may not) use them. Attempting to understand students' perceptions of each ICT would not only be unwieldy, but would be quickly outdated. But to try to understand the essence of students' experiences with ICTs may provide a more lasting and inclusive insight. Finally, the phenomenological study is designed to develop a social perspective, which dovetails well with the new literacies definition of literacies as social practices (Lankshear & Knobel, 2007; Street, 2008).

Participants and Sampling Strategy

Two groups of participants were interviewed during this study: first-year students and instructors of first-year students. First-year students were the focal participants as they are the ones who experienced the phenomenon (Moustakas, 1994; Polkinghorne, 1989; Van Manen, 1990). Instructors of first-year students were interviewed in order to provide triangulation of the data through their perspectives as the individuals who created the learning environments for students

This study was conducted at a mid-sized public university in the Great Plains, Keyboard State University. The university is comprised of three campuses, two of which offer a combined 250 undergraduate majors and options. The third campus is home only to graduate programs. All participants attended or taught at the university on either of the two campuses with undergraduate degree programs.

Simply finding first-year students and faculty willing to participate in the study was not enough. Polkinghorne (1989) describes two requirements of participants in a phenomenological study: they must have experienced the phenomenon and they must be able to articulate their experience. Once I identified interested students, I contacted them for a short introductory conversation to break the ice, to explain the study in more detail, to determine if the student was a first-year student, and to ascertain if the participant could communicate in depth about the topic. I then determined whether students could communicate in depth about ICTs by how they responded to one of two prompt questions:

1. What technology do you dream of owning?
2. What technology do you wish didn't exist?

Instructors and faculty who participated in the study were those who I either engaged in a brief conversation about ICTs in college or who I had engaged in similar conversations at some point in the past.

Students

Students for this study were recruited from over 3500 first-year students at the university. Unlike quantitative research when methods such as random sampling are employed to establish certain target percentages of the population in order to ensure the generalizability of a study, qualitative research focuses instead on the objectives of the research and the availability of resources (Patton, 2002). There is no established number of participants needed for a phenomenological study. Polkinghorne (1989) notes that studies vary from three participants to 325. Nineteen students participated in this study.

In this study, I used maximum variation sampling with established criteria to guide the sampling strategy. Maximum variation sampling involves "purposefully picking a wide range of cases to get variation on dimensions of interest" (Patton, 2002, p. 204). By starting the study with the intent to maximize differences, the findings were more likely to reflect different perspectives

(Creswell, 2007). While seeking a common, shared experience, maximum variation takes the heterogeneity of the sample in account and makes it a strength of the study. As Patton (2002) stated, “Any common patterns that emerge from great variation are of particular interest and value in capturing the core experiences and central, shared dimensions of a setting or phenomenon” (p. 235). For this study, the maximum variation sampling criteria were based upon the demographics of first-year students at the university obtained from the “Undergraduate Enrollment and Demographics” section of the university’s *Fact Book* for 2011, the most recent data available at the start of the study, as well as evidence from the literature to identify dimensions of low use or high use populations along the digital spectrum (Kansas State University, 2012).

I started with the goal of recruiting at least 10 first-year participants and proceeded until saturation and the criteria for maximum variation sampling were reached. Saturation, or the point of redundancy, occurs when new interviews, or other points of data collection, no longer reveal new information (Creswell, Hanson, Clark Plano, & Morales, 2007; Patton, 2002). Criteria for maximum variation included diversity based on gender, race, socioeconomic status, age, self-identified ICT skills, and course enrollment. Each of these is discussed below in greater detail. More information about the role gender, race, socioeconomic status, and age play in the use of and access to ICTs is discussed in greater detail in Chapter 2.

Student participants were recruited using a variety of methods. I sought a wide variety of first-year students and encouraged those who embraced ICTs, struggled with ICTs, or who did not care one way or another about ICTs to participate. Due to the commitment needed by participants for up to three meetings, I anticipated that identifying enough participants who could both discuss their experiences and commit to the study would be a hurdle. For that reason, I offered students who participated in both interviews a gift card as a token of my appreciation.

The first phase of recruitment involved widespread advertising at the two campuses with undergraduate student enrollment. I posted informational fliers across one campus at the start of the semester and, a few weeks later, a colleague assisted me by distributing fliers at the second campus. I distributed electronic versions of the fliers to instructors who were involved with the university’s first-year experience program and to student academic support professionals to share with their students. The promotional fliers produced few volunteers. I then contacted colleagues who taught courses with predominantly first-year student populations. Through these contacts, I

visited a variety of classes, many of which were associated with the university's first-year experience program. The majority of students were recruited from these class visits. Two participants learned of the study through their instructors. One student volunteered after learning of the study on a Facebook page for his residence hall. I recruited another participant after a conversation at a campus event. Recruitment continued through November, when the researcher determined that saturation and the criteria for maximum variation sampling were reached. Basic demographics of student participants are available in Table 1.1, and more complete profiles of the student participants are available in Appendix A.

Two patterns emerged when recruiting students. First, achieving a diversity of students from a variety of racial backgrounds and identifying a student who was non-traditional took the longest amount of time. The second pattern was that the definition of first-year students as being those who were in their first semester of college was not as clear in practice. As noted earlier, the first conversation I held with students included confirming that the volunteer was a first-year student. During these conversations, questions arose about situations such as students who transferred from other universities, students who participated in summer bridge programs, students with concurrent credits, and even students who started college elsewhere but had not finished the semester. I discussed these questions with my major professor in order to seek guidance. We decided that, unless students had already completed a semester or more of college non-concurrently with high school, they were considered first-year students for the purpose of this study. One student who had been initially considered outside the definition of a first-year student due to participation in a summer bridge program was subsequently contacted and invited to participate, but that student never responded. Otherwise, I am not aware of a student volunteer not being included on the basis of first-year status once the definition was clarified. It is worth noting that many of the student participants were enrolled in classes through the university's first-year program.

Gender: The population of first-year students at the university is almost evenly split 50% female, 50% male (recorded data does not report transgendered or intersexed persons). In recent years, gender gaps in use of ICTs have diminished, although there remain some gender differences in what ICTs are used and how (Ching et al., 2005; Cooper, 2006; Goode, 2004; Hargittai & Shafer, 2006; He & Freeman, 2010; Hu et al., 2012; Selwyn, 2008). This study included 7 men and 12 women, as self-reported.

Race: The university's first-year population for the fall 2011 semester was comprised of: 79% White, 6% Hispanic, 5% Black, 3% Multiracial, 2% Asian, and 1% Unknown students. The cohorts of American Indian and Hawaiian/Pacific Islander students were small enough that they did not rise to even 1% of the first-year student population. (Percentages calculated based upon undergraduate student demographics reported by the university.) Race continues to be associated with different access to or use of ICTs (Ching et al., 2005; Flowers et al., 2000; Flowers & Zhang, 2003; Goode, 2010; Goode, 2004; Junco et al., 2010). Students who participated in the study identified themselves as:

- African American – one student
- Asian – one student
- Caucasian or White –15 students
- Filipino/Caucasian (specified as: Welsh, Irish, Swedish, English) – one student
- Other (Black/Caucasian/Native American) – one student

Socioeconomic status: Socioeconomic status remains a correlate of ICT use or non-use (Ching et al., 2005; Cuban, Kirkpatrick, & Peck, 2001; Flowers & Zhang, 2003; Goode, 2010; Goode, 2004; Junco et al., 2010). Students in this study were asked to describe their family's economic status or circumstances. While a clear comparison chart may permit for a more concise overview, asking participants to self-report their family's financial or economic status allowed for greater insight and also highlighted the economic transitions participants experienced while growing up and when entering college. The participants' self-reported socioeconomic statuses included: lower class, middle class, upper middle class, and "pretty well off." Greater detail about each student's financial or economic status, including clarifying statements by the students, is available in Appendix A.

Age: Although the majority of first-year students at this institution are the traditional 18-19 years of age, non-traditional students who are 25 years of age or older provide an alternative perspective of ICTs that is not commonly discussed in the literature in regards to first-year students at four-year institutions. About 11% of all undergraduates at the institution are 25 years of age or older according to percentages calculated based upon undergraduate student demographics reported by the university (Kansas State University, 2012). This study included one student who was 17 years of age, 17 students aged 18-19 years of age, and one non-traditional student who was 43 years of age.

Disparate self-identified ICT skills: Students enter college with a wide range of self-identified ICT skills (Ching et al., 2005; Cooper, 2006; Hargittai & Shafer, 2006; He & Freeman, 2010; Hu et al., 2012; Selwyn, 2008). Including participants who self-identified as expert, comfortable, or not comfortable with ICTs ensured that the study did not focus on participants at either end of the range. This study included students who self-reported at all levels of ICT skill. Students were asked to describe their proficiency with ICTs before college and then their proficiency after they had been in college. Participants included those who reported not being good with ICTs or not being as good as their classmates, and students who reported to being very proficient. The majority of participants qualified their proficiency by indicating what types of ICTs they were comfortable with or in what situations. Greater detail about each student's proficiency, including clarifying statements by the students, is available in Appendix A.

Disparate majors and classes: This study included participants from a diversity of majors including: Biology, Business Administration, Civil Engineering, Computer Technology--Networking, Criminology, Elementary Education, Kinesiology, Microbiology, Open Option, Physical Therapy, Pre-Nursing/Life Sciences, Psychology. Participants were enrolled in a variety of classes. Due to recruitment, some participants were enrolled in the same class but no more than five students were enrolled in any one class together. Recruiting students from a variety of classes was done to avoid the possibility of all the participants' perceptions being colored by their experiences with one shared course and instructor.

Table 1.1 Student Participant Demographics.

Name	Age	Race	Gender	Major
Abby	18	Caucasian	Female	Elementary Education
Bethany	18	African American	Female	Open Option
Brandee	19	Caucasian	Female	Open Option
Brandon	19	Caucasian/White	Male	Business Administration
Brittany	18	Caucasian/White	Female	Biology
Christine	18	Caucasian/White	Female	Open Option
Cody	18	Caucasian	Male	Criminology
Craig	43	White	Male	Computer Technology- Networking
Daniel	17	Caucasian/White	Male	Civil Engineering
Ellen	18	Caucasian/White	Female	Microbiology
Erica	18	White/Caucasian	Female	Psychology
Jacob	18	Filipino/Welsh/Irish/Swedish/English	Male	Psychology
Lisa	18	Caucasian	Female	Pre-Nursing/Life Sciences
Michael	19	White	Male	Criminology
Mingxia	19	Asian	Female	Open Option
Nate	18	Caucasian	Male	Open Option
Rachel	18	Caucasian/White	Female	Open Option
Samantha	18	Caucasian	Female	Open Option
Yolanda	18	Other: Black/Caucasian/Native American	Female	Physical Therapy; Leadership minor

Note: All information self-reported. More complete profiles can be found in Appendix A.

Faculty

Six faculty members were recruited through a mix of a call for volunteers at a meeting with instructors in the university's first-year experience program and snowball sampling. While snowballing can be used on its own as a method of purposeful sampling (Creswell, 2007; Patton, 2002), for this study, I used it to ask contacts on campus to recommend faculty whose attributes

would round out the study sample for maximum variation and who would be interested in participating. Basic demographics of the faculty participants can be found in Table 1.2, and more complete profiles of the faculty participants can be found in Appendix B.

Although this study uses the term “faculty,” the participants at this level were tenure-track/tenured faculty (professors) and non-tenure track (instructors). Graduate teaching assistants were not included in this study as they have less autonomy in how they teach their courses. Participants were instructors of at least one course that predominantly enrolled first-year students, during the fall semester. Recruiting instructors who were teaching first-year students during the fall semester was done in order to ensure that the faculty perspectives were contemporaneous with those of the students in the study.

The target for maximum variation of faculty participants was inclusion of at least one faculty member who was comfortable with and incorporated ICTs into the class and one faculty member who was not comfortable with and did not incorporate ICTs in the class. The faculty members qualified their levels of comfort with ICTs and the degree to which they incorporated ICTs in their first-year classes. Three of the faculty participants reported feeling comfortable with ICTs and using them in their classes with first-year students. When analyzing the interviews, I realized that none of my professors were both uncomfortable with ICTs and did not incorporate them into the class. However, within my faculty participants was one who decided not to use ICTs in his class with first-year students and several faculty participants who expressed not being comfortable with various aspects of ICTs. One professor reported feeling as though she was still learning ICTs, but was increasing her use of them in classes. Another professor reported that he felt about average in terms of his comfort with ICTs but decided not to use them at all in his first-year class. And, finally, one professor reported feeling competent with in-class ICTs, but not social ICTs such as smartphones or Facebook. More details about each faculty participant’s ICT comfort and inclusion levels in their first-year classes are available in Faculty Participant Profiles in Appendix B.

Faculty members were from the sciences, arts, humanities, and academic support. Their years spent teaching first-year students ranged from four to 12. They were each thanked for their participation with an offer of coffee or lunch.

Faculty and student participants were not actively recruited from the same classes; however, it is possible that a faculty participant taught one or more of the student participants. As

will be detailed later in Chapter 4, Professor Fforde and one of the students, Daniel, did relate their experiences with the same online homework program. Otherwise, generally speaking, faculty and student statements do not necessarily reflect experiences in the same classes.

Table 1.2 Faculty participant demographics.

Name	Field	Years Teaching First-Year Students
Professor Xavier	Humanities	4-5 years
Professor Bhaer	Academic Support	8 years
Professor Darnay	Arts	8 years
Professor Dashwood	Humanities	9 years
Professor Eyre	Sciences	Since 2008
Professor Fforde	Sciences	15 years

Note. More complete profiles appear in Appendix B.

Data Collection

The data for this study were collected through face-to-face interviews with first-year students and face-to-face interviews with faculty. Face-to-face interviews offered participants the opportunity to describe how they lived the experience and to provide context for their behavior (Pollio et al., 1997; Seidman, 1991). The initial design of the study included conducting focus groups with the student participants. (The plan to use focus groups and the decision, in the end, not to conduct focus groups is discussed below.) During focus groups, participants would have been able to hear each other’s responses and contribute their own comments in response (Patton, 2002). While it is possible that participants would not have independently or consciously made their own meaning of their experiences with ICTs prior to the study, the dialogue within an interview or focus group supported meaning-making within the natural give-and-take, question-answer-clarification process of a phenomenological interview (Pollio et al., 1997). Building upon Gee’s (2012) Discourses, one of the benefits of interviewing students who may not be full members of a Discourse –that is, they are still relatively new to the university culture -- is that Gee posits that marginal members of a Discourse may actually have acquired a meta-knowledge of that Discourse in order to function.

Seidman (1991) recommends a three-interview process that “combines life-history interviewing... and focused, in-depth interviewing informed by assumptions drawn from phenomenology” (p.9). The three interviews are arranged thusly:

Interview One: Focused Life History

Interview Two: The Details of the Experience

Interview Three: Reflection on the Meaning (Seidman, 1991)

Polkinghorne (2005) also recommends a three-interview per participant process based upon the belief that participants will not be comfortable enough to open up on the first interview.

Students

This study slightly modified the three-interview process when interviewing the first-year students. I met with participants for two individual interviews and invited all students to participate in a focus group. The two interviews followed Seidman's model. The first interview focused on life history related to the participants' use of ICTs prior to college, and, in the second interview, participants were asked to describe their experiences with ICTs in college. Furthermore, participants were to be asked to "reflect on the meaning of their experience" during the focus groups (Seidman, 1991, p.12). Every student who participated in the first interview also completed a second interview.

The individual interviews averaged one hour in length. Some were as short as 30 minutes, while others lasted for over an hour and 20 minutes. Interviews were scheduled at a time that was mutually acceptable to the participant and myself. The majority of the interviews were held in an unused private office in the main campus library. The main library is physically located at the center of campus and already a common meeting place for students. Due to scheduling conflicts, one interview was held in the library's 24-hour study area on a Sunday morning. A fire alarm in the middle of another interview necessitated relocating to the Student Union mid-way through the interview. Both participants were agreeable to the relocations.

In each interview, I provided participants with a definition and sample list of ICTs (see Appendix C) to ensure that everyone discussed the same thing and to stimulate the dialogue in case the participant initially struggled to identify experiences with ICTs. Each participant was also provided with an informed consent form outlining the objectives of the interview (See Appendix D). The interviews were guided by a series of open-ended questions designed to capture and to describe "how people experience some phenomenon--how they perceive it, describe it, feel about it, judge it, remember it, make sense of it, and talk about it with others." (Patton, 2002, p. 104). Patton describes six types of questions that may be employed in qualitative interviews: experience and behavior questions, opinion and values questions, feeling

questions, knowledge questions, sensory questions, and background/demographic questions. Moustakas (1994) offers seven questions for a phenomenological interview that similarly incorporate feelings, thoughts, experiences, and behaviors, plus an inquiry about how the experience affects significant others in the participant's life.

When interviewing the first-year students, background and demographic questions were asked in the first full interview to ensure the research participants represented diverse backgrounds and experiences. The first interview, focusing on the participant's history, integrated background questions with the experience and behavior questions (see Appendix E). The second interview employed experience and behavior questions, plus opinions and values questions as participants were asked to reflect on their meaning of their experiences (see Appendix F). Feeling, knowledge, and sensory questions, plus queries about how the experiences affected those close to them, were called upon to help the participants more thoroughly describe their experiences in both interviews.

I scheduled time immediately after all interviews to record notes and reflections about the specific interview. These included reminders to follow up on a question in a later interview, notes when a participant was reluctant to answer a particular question, recording that a certain question was misunderstood, and to generally reflect on the interview. Analysis of the data may begin within minutes of the end of the first interview when the researcher records reflections on the interview (Patton, 2002). However, Seidman (1991) cautions against delving too deeply into analysis at this point. As the *epoché*, or setting aside personal expectations by the researcher, is an integral aspect of the phenomenological study and analysis (Moustakas, 1994; Polkinghorne, 1989; Pollio et al., 1997), I followed Seidman's approach and confined the interview reflections to focus on the methodology of the data collection, rather than as an opportunity for analysis.

Following the individual interviews, student participants were invited to participate in focus groups. Focus groups are typically comprised of participants with similar backgrounds or experiences (Creswell, 2007; Patton, 2002). The focus groups for this study were to be formed based upon two extremes: students who described themselves as comfortable with ICTs and students who described themselves as uncomfortable with ICTs. Rather than placing students in groups based upon their socio-economic demographics and looking for commonalities in their ICT use, the focus groups were intended to reveal commonalities in backgrounds and experiences among students with similar self-perceived ICT skills that did not arise in individual

interviews. Opinions and values questions were to be asked during the focus groups to guide participants in reflecting upon the meaning of their experiences (See Appendix G).

Unfortunately, despite initial student interest, the focus groups were unable to be held. I attempted to schedule focus groups with 14 of the 19 student participants who indicated that they would or might be interested in participating in the focus groups. The focus groups were scheduled for the week before Thanksgiving. Six participants responded but, ultimately, none were able to participate that week. I contacted the six students again to schedule focus groups early December, before semester final exams. Only two students responded. By that point in the semester, scheduling focus groups with the original participants was no longer feasible.

I then explored alternative options for focus groups comprised of homogenous first-year populations. These included contacting the professor of a class known to incorporate high levels of ICTs, the managers of the university's information technology help desk, and a student at the university who was member of an international online community. Unfortunately, the class was not using ICTs to the degree it had in the past. The IT Help Desk did not have enough first-year student employees to comprise a focus group. And the student could not identify any first-year students at the university who were also members of the online community.

After consultation with my major professor, I proposed modifying the study by eliminating the focus groups. This was done for several reasons. First, nearly double the base number of students and the base number of faculty participated in interviews, increasing the amount of data available for study. Secondly, the focus groups were intended to be part of data triangulation, as sometimes ideas or trends are uncovered or reinforced in a group conversation that do not arise in one-on-one interviews. Triangulation was still present in the study, though, through the student and faculty interviews. Students were interviewed twice each, permitting internal verification of their perceptions of their experiences. The faculty interviews provided context or corroboration for the experiences students described in the interviews.

I also considered the implications of not conducting focus groups, particularly as the focus group questions were designed to ask participants to "reflect on the meaning of their experience." I determined that questions asked during interviews, especially follow-up questions about specific experiences, did ask students to reflect how their experiences changed their behavior or beliefs or affected those close to them. Additionally, trends and commonalities could be gleaned from individual interviews. Presented with the circumstances and the considerations

described above, my supervisory committee approved the aforementioned modification to the study; focus groups were not included.

Faculty

Faculty members were invited to participate in individual, face-to-face interviews. Each faculty member was interviewed one time for approximately one hour. At the beginning of the interview, the faculty member was provided with a definition and sample list of ICTs (see Appendix C) both to ensure that everyone discussed the same thing and to stimulate the dialogue in case the participant struggled to identify experiences with ICTs. The faculty member was also provided with an informed consent form (See Appendix D). The focus of the faculty interview was to explore how they expected first-year students to use ICTs. The questions crossed the span of question types: experience and behavior questions; opinion and values questions; feeling questions; knowledge questions; sensory questions; and background/demographic questions (See Appendix H). The interviews were conducted in an unused private office in the university library. The researcher recorded notes and reflections about the specific interview immediately after each interview.

Data Management

All interviews were recorded using both primary and backup audio devices: an iPod with an internal microphone and an iPad with an internal microphone. These recordings were saved as a common audio file for transcription. The audio recordings, transcriptions, and other notes were stored on an external hard drive. A second external hard drive was used for back up storage. Printed copies of the transcriptions and notes are stored in a locked file cabinet in my home. Throughout the interviews, I used a minimum of hand-written notes, as they could be distracting to the participants and to me. Immediately at the end of each interview, I wrote a reflection on the interview that included notes about how well the questions worked, what happened in the physical environment, if the participant gave particular non-verbal cues, and other general insights.

Epoche

Phenomenology requires that the researcher consciously review his or her expectations, prejudices, and prior judgments, and then set those aside in order to become open to the

experiences, expressions, and perceptions of the participants (Moustakas, 1994). This is commonly referred to as epoche or bracketing. During the study, I kept a journal to reflect upon my personal use of ICTs, memories of experiences learning them, and expectations of the research. The journal was not treated as data and was not analyzed. Highlights from my reflections are shared below in order to provide a sense of my biases.

I consider myself a child of the *Oregon Trail*. I first used a computer in the fourth or fifth grade, in the mid 1980's, when each student in my class was assigned time to play the computer game *Oregon Trail* or a math program. My family was extremely late in adopting many ICTs, so my access to computers was limited to what I could access in school. Through a keyboarding class and a basic programming class, in which I programmed a turtle that moved in a square on my screen, I achieved a basic level of computer literacy by the time I graduated from high school. However, because we did not have computer at home, I wrote the majority of my papers on a typewriter. I was jealous of my classmates who were wealthier than my middle-class family or whose parents taught at the university in my town because they were able to write their papers on computers. I knew that they merely had to hit Delete when they made a typo on a paper, while I had to rip out the page and start over.

I attended a large public university and majored in English. I wrote most of my papers on my brother's word processor that offered me two things a typewriter could not: the ability to save my paper on a disc and a small screen where I could view and edit about ten lines of text. I was delighted with this technology. While there were computer labs on campus that I could use, I never felt comfortable in them. After college, I bought a computer in anticipation of graduate school. I was the first person in my family to buy a computer. I cannot remember if I followed guidelines for my graduate program in deciding what features I needed on my computer. I did ask a family friend who worked in IT on campus for advice, and I made sure my computer had a modem, although I do not remember if I anticipated specific uses for it, or because the magazines said it was needed. By this time, Mosaic, the internet browser, had been released and I remember a co-worker telling me with awe about being able to see pictures on the screen. I literally could not imagine this.

I developed a confidence with ICTs in graduate school. My library science program was steeped in technology, as library resources were moving online. Additionally, my computer crashed several times during my first year in school. I spent hours on the phone with technical

support, learning to take apart my computer to get to my hard drive. I installed new chips, learned to reboot my computer, and realized that I could dig around in my computer without damaging it.

ICTs are now an integral part of my life. I am very comfortable troubleshooting my computer. I teach students to use databases and help them troubleshoot problems with word processing programs. Personally, I am typically a second-wave adopter. While I try many things, I only adopt that which I have a use for, personally or professionally. My cell phone only texts and calls, but I do own iPods and an iPad. During grad school I developed an ICT literacy that I continuously apply in learning new ICTs. As I tell students learning to search in library databases, it's a lot like learning to drive a car. You do not learn to drive a Ford or a Subaru, you learn to drive a car and then you apply that knowledge to every car you drive.

My expectations of this study were that I would learn something that would help me bridge the gaps between what I understood about ICTs, what I assumed students knew based upon my observations, and the ways students used ICTs that I could never imagine. I clearly remember the moment when I realized that college students used technology in ways that I never conceived of. I was teaching a class and trying to use television stations as an analogy to something with library databases. The students looked at me blankly when I asked talked about cable contracts and then explained to me that they watched television shows on the internet. Because I adopted technology late, I also wondered if there were students today who were late adopters as well and to what extent that affected their experiences in college. Finally, I was really hoping to learn something that would offer a more nuanced perspective of how students used ICTs than the stereotypes of Millennials that propagate the news and popular culture.

Data Analysis

After collecting the data, I began “organizing and analyzing the data to facilitate development of individual textural and structural descriptions, a composite textural description, a composite structural description, and a synthesis of textural and structural meanings and essences” (Moustakas, 1994, p. 104). The data, in this case the transcripts from all of the interviews, was analyzed as described below. The data analysis was iterative, involving multiple passes between the texts, reviewing the codes or themes, and peer debriefing. Peer debriefing is a

form of validation that may include a peer, or colleague, of the researcher questioning the methods or meanings as an external check on the research process (Creswell et al., 2007).

The interviews were analyzed as two distinct sets. The one-on-one student interviews were analyzed as one set. The one-on-one faculty interviews were analyzed as another set. Each set of interviews was analyzed separately and sequentially – that is, the researcher proceeded through the entire analysis for the student interviews prior to analyzing the faculty interviews. Separating the transcripts supported the triangulation of data, as the perspectives of the students were analyzed separately from those of the faculty, permitting me to compare the two perspectives (Patton, 2002).

The first step in organizing and analyzing the data was transcribing the interviews from audio recordings to text. A professional transcription company transcribed some of the interviews, and I transcribed the others. Permission was obtained from all participants whose interviews were transcribed by the company. I compared all of the transcripts against the audio recordings and made edits to the transcripts as needed. Through this process, I began establishing an intimate awareness of the texts, spending hours with each interview, affording me the opportunity to “generate emergent insights” (Patton, 2002, p. 441). I tracked these ideas and insights in a notebook.

I shared the transcripts with the participants who were asked to review the transcripts in order to identify errors or to clarify muddy points such as timeline inconsistencies. At this point, the goal of the sharing the transcript with the participant was not member checking, *per se*, but to ensure that the transcripts did not contain factual errors or discrepancies with the participant’s memory of the interview. Ultimately, all except four participants confirmed or provided edits to their transcripts. Those four were contacted two to three times via email for confirmation, but they did not respond.

Once all of the interviews were conducted and transcripts returned and corrected, I began close and repeated readings of the transcripts (or texts) in order to identify key themes and ideas. To that end, I used the qualitative analysis program, HyperResearch, to aid in this process. HyperResearch was chosen for two reasons. The first reason was its compatibility with the Mac computer that I use. Secondly, the program tracked all applications of a label or code to the text. This permitted me to generate reports comprised of the text that had been labeled with one or two codes.

Beginning with the codes or labels initially identified during the transcription process, I analyzed a total of 19 student interviews, which included Interviews 1 and 2 for nine participants, and Interview 1 for one participant. I analyzed each of the 19 interviews, breaking the texts down into data units (Rudin & Rudin, 2005). This entailed reading the texts and labeling a section of the participant's response with a code like, "communicating with instructor." Within that particular section, there might be a portion that discussed when a participant would email an instructor or when talking in-person was preferred. That section would also be labeled "email vs. in-person." That e-mail vs. in-person section might overlap with a section when the participant spoke about being nervous composing an email to an instructor for the first time, so that portion was labeled, or coded "nervousness or anxiousness."

I analyzed 19 of the 38 interviews this way, attempting to closely analyze the data both for its discrete meaning and emerging patterns that developed within and across interviews. By the 19th interview, the process generated an unwieldy 775 codes, with some interviews bearing upwards of 150 labels. Creswell (2007) notes that this high number of codes is not unusual for beginning researchers. Alongside the coding, I created a new document to identify developing trends and themes within the texts and fleshed out patterns that struck her as significant to the phenomenon.

I then met with a colleague who was experienced in qualitative research to review, or to peer check, the initial analysis. The peer checking helped identify those codes that addressed the phenomenon and those codes that were too narrow or irrelevant to the phenomenon. While my initial coding was intensely granular, I used the process to gauge the depth of analysis necessary and to increase my immersion in the data. I pared the codes down to approximately 20, which is much closer to the 25-30 suggested by Creswell (2007, p. 152).

I returned to the interviews by uploading fresh (i.e. un-coded) versions of all interviews into HyperResearch. This time, I put the codes to the side and embarked on phenomenological reduction that Moustakas (1994) describes as the process whereby the researcher first treats each statement equally, and then pares away those that are irrelevant or redundant, leaving only the texts that address the phenomenon, what he terms, "horizons." Given the functionality of HyperResearch, the process followed a variation offered by Seidman (1991) that entailed reading the text and highlighting or bracketing the sections that were interesting. I exported the horizons into a separate document where I organized them into categories or clusters (Seidman, 1991).

Some of the clusters had previously been identified in the transcription process or in the initial close analysis. Other clusters were new. I studied the clusters to identify unifying patterns that could be connected into larger themes. While working with the clusters and themes, I moved back and forth between the texts and the themes to gauge the appropriateness of the themes. I also met again with my colleague to review a first draft of major themes and to identify deeper, more relevant themes. Based upon the themes, I created a textural description of the phenomenon. The textural description is, “a description of an experience that doesn’t contain that experience (i.e. the feeling of vulnerability expressed by rape victims)” (Patton, 2002, p. 486).

The next step in the data analysis was imaginative variation (Moustakas, 1994). Through imaginative variation, I once again studied the themes, this time to create structural descriptions that described the “the underlying and precipitating factors that account for what is being experienced; in other words the ‘how’ that speaks to conditions that illuminate the ‘what’ of experience. How did the experience of the phenomenon come to be what it is?” (Moustakas, 1994, p. 98)

Once I created the textural and structural descriptions for each set of data, I shared them with the participants from those groups. The participants were asked if my descriptions matched their experiences. This member checking ensured that I interpreted the data in such a way that it reflects the experience of those who lived it (Moustakas, 1994; Pollio et al., 1997). Finally, I combined the textural and structural descriptions “into a unified statement of the essences of the experience of the phenomenon as a whole” (Moustakas, 1994, p. 100). The essence is the shared, common experience of the participants. The essence also underwent member checking.

Trustworthiness

The trustworthiness of this study was established by adhering to the tenets of phenomenological research (Creswell, 2007) and by ensuring that any finding or themes were based upon the evidence of the participants’ self-described personal experiences (Pollio et al., 1997). As described in prior sections of the methodology, I based the study on the tenets of phenomenology. The phenomenon to be studied was clearly communicated and the procedures for data collection and analysis followed those described by key phenomenological researchers.

I used several techniques to ensure that the findings of the study have a basis in the textual evidence. These include triangulation, member checking, and peer debriefing. Creswell

(2007) recommends triangulation with multiple sources of data in order to corroborate evidence. This study incorporated triangulation in two ways. The first was by interviewing faculty in addition to first-year students. The faculty interviews provided context or corroboration for the experiences students described in the interviews. Secondly, students were interviewed twice, which provided internal verification of their perceptions of the experience (Patton, 2002). Participants were asked to member check, or to review, the essence to ensure that I accurately described the experience (Moustakas, 1994; Pollio et al., 1997). As of this writing, 15 of the student participants replied: 14 confirmed that they could see their experiences in the essence, and one could not. I contacted that participant for clarification, but have not received a response, as of yet. I used peer debriefing in order to ensure that the research methods were adhered to and that the findings are supported by the data.

Finally, I used thick, detailed text to describe the phenomenon. The text included quotes from the transcripts in order to provide readers with “textual evidence supporting the interpretation, and whether the goal of providing a first-person understanding was attained” (Pollio et al., 1997, p. 53). The rich, thick description will allow the reader to determine if the findings can be transferred to other universities or situations (Creswell, 2007).

Limitations of the Study Design

The primary limitation of this study design was that I was unable to identify enough participants who wished to, or could commit to, the focus groups. The study was limited to participants from one university, so the findings may not be generalized to all universities. The study also held limits in perceived social inequity or power issues between the interviewer and the participants (Seidman, 1991). Perceived social inequity or power issues may cause a participant to be reticent or to respond in a way that does not truly reflect her or his experience of the phenomenon. While this cannot be entirely accounted for, multiple interviews with the same individual can provide internal verification of a participant’s perceptions of the experience (Patton, 2002). An unanticipated limitation of the study design was the use of an iPod and an iPad to record the interviews. While the devices were chosen for convenience and quality, comments made by some of the participants led me to realize that assumptions were made about my level of proficiency with technologies, particularly in comparison with the participant’s perceptions of their own skills. For instance, one participant, when illustrating a point said that,

“I’m assuming you know a lot more about computers because of your iPad. And, I would feel embarrassed having a conversation with you because you would use terminology over my head.” However, since I was asking him about his experiences with ICTs, rather than the technical details of a computer, he was able to fully participate in the interview with deep, rich details. Other students assumed that I knew more about smartphones that I did because they saw my iPod or mistook it for an iPhone. In those instances, I either clarified that it was an iPod or merely asked them follow-up questions to ensure I understood their experiences.

Summary

In this study, I used the phenomenological approach to explore how first-year college students experienced ICTs in higher education. Employing maximum variation sampling, I recruited 19 first-year students to participate in two one-on-one interviews each. Maximum variation sampling and snowball sampling identified six faculty or instructors of first-year students who participated in single one-on-one interviews. Triangulation of data was achieved by interviewing each student twice and by comparing the students’ perspectives with that of the faculty. The interviews were audio-recorded and transcribed verbatim. The transcripts were uploaded to the qualitative research software, HyperResearch for analysis. Participants were asked for feedback, or member checking, on the study’s findings. I also employed peer debriefing, and thick, detailed text to strengthen the trustworthiness of the findings. Those findings are discussed in the next chapter.

Chapter 4 - Findings

This chapter presents the findings of this phenomenological study. Based upon an analysis of data, three themes emerged regarding how students perceive their experiences with information and communication technologies in higher education. The students' own stories are used to describe their experiences. Stories from instructors of first-year students provide additional context to the experiences.

How first-year students perceive information and communication technologies in higher education.

Based upon student statements, three themes emerged regarding how students experience ICTs in higher education. Statements from students and faculty suggest that students experienced ICTs in higher education as: a process of academic integration; situations for which they held internal or external loci of control when using them for academic purposes, and tools to use when becoming socially integrated into the university. This chapter will describe these themes and then come together to describe the essence of the students' common, shared experience.

Academic Integration

Students entering college were almost immediately made aware of expectations about their use of ICTs in the academic arena of the university, helping them to become academically integrated into the university through compliance with the university's "explicit norms" and "normative academic values" (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006). These norms, or expectations, included what ICTs that they needed to use, how they would use the ICTs, and in what context the ICTs were to be used. Many instructors explicitly communicated their expectations. However, students encountered other norms that were implicit or encompassed assumptions about their knowledge of ICTs or ability to use ICTs. Within all of these expectations, students and their instructors experienced expectation dissonance when their understandings of or implementations of the expectations were not in accord.

Explicit Expectations

Many students remembered the first few days of classes as a time when their instructors reviewed basic course expectations, including the ICTs that the students needed to use. This was frequently when students heard about the university course management system, Keyboard State Online; the need to regularly check their university email; and other ICTs like online homework or quizzes. Through their personal experiences students learned the consequences or benefits of using the course ICTs in light of their professor's expectations. As the semester progressed, students were introduced to more nuanced expectations like the etiquette for communicating with professors via email. Finally, instructors incorporated ICTs into the lectures and coursework as a way to illustrate expectations for the content they expected students to learn.

Course ICTs

Instructors communicated their expectations during class and reinforced them through guidelines like the syllabus. They not only communicated the expectation that an ICT would be used, but that the students had a level of personal responsibility for using those ICTs. Professor Eyre used humor to ensure that students remembered that it was their responsibility to their progress on the course management system:

I actually play a video clip... on the first day of class. And, it's a stupid little animation on YouTube. It's about "I'm worried about my grade" and there are like these little bears you know with the, with the robot voice... I show that and I say, "Don't be this bear. You always know what your grade is. All you have to do is go to [Keyboard State Online] and you know exactly what your grade is at that point in time." And, you know there's-- so, there's no excuse for the last week of class saying, "God, how can I be doing so bad? Can I do extra credit?"

Professor Fforde explained that for his classes:

It's clearly delineated in the syllabus at the beginning that any information that might come up that might be important to you will be delivered via email to your [Keyboard State] email address. You are responsible for making sure that you check your email at least once a day. So, it's their responsibility. If they don't -- they don't.

Daniel, a student in Electrical Engineering, recounted being taught how to use the online textbook for one of his classes: “On the second day they had the representative coming to show you how to login, how to get to your assignments, how to use the review stuff, then that was the whole class.” He had never used an online textbook before and appreciated the orientation, “I really had no idea where to start on that thing. They were like, ‘OK, here's where you start.’ [Laughter] I can do this.” Even though Nate, a student in Open Option, had never taken an online quiz or test before college, he was fairly comfortable with the process, particularly after one of his professors spoke with the class to establish his expectations:

The instructor was, like, “It's really simple. Make sure you save your progress often enough, so that, in case the worst is to happen, you've got that saved progress.” And basically, it's -- you know, “95% of the class is going to do this fine. The 5% that doesn't, or that messes up, lose power, lose Internet connection, or it freezes, something like that,” he said, “Oh, I'll talk with you, and we'll figure out a way, but for the -- most of you,” he was basically making sure that 60 minutes wasn't going to be, you know, extended... “Most of you will be fine, so don't come crying to me, like, ‘Oh, I didn't finish the test in time, because I was -- I don't know, busy procrastinating or daydreaming or whatever.’”

These expectations were necessary to communicate because many students did not enter college with the ICTs habits they needed to function in college. While email was commonly known, many students did not make a habit of checking it before college. Nate explained, “I would say before I came to college it was, it was very rare for me to check my email and actually use my email that much other than to, you know, have an account on Facebook or, or what have you.” Rachel, a student in Open Option, planned to play percussion in the orchestra but discovered shortly before coming to college, “I had lots of emails already and I was kind of surprised. I was like, ‘Oh, I forgot about that.’” Among those emails were some from the orchestra professor, who, according to Rachel, was

sending me emails saying that I need to tell him what instrument I play so he could give me audition music...And I was like, “Oh, I didn't realize that,” so I had to just drop it. So, maybe if I had seen it earlier I would've been able to prepare for auditions.”

Rachel acknowledged that, “I’m sure we talked about it at our orientation, but I kind of...throughout the whole summer I forgot about it and I just wasn’t even thinking about it.” Once the semester was underway, Rachel established routines to ensure she didn’t miss information, “I usually check my Webmail everyday and then I don’t check my grades everyday because nothing ever changes so I just do it every other day usually.”

Students also learned that instructors for some courses held different expectations than those held by the university population in general. Students who comprehended the reasons for the different expectations, or could continue to meet general expectations such as tracking their course progress, generally accepted the altered expectations. Craig reported that one of his instructors did not use the course management system because, “She has found in recent years that it is not reliable because her essays count as a lot of points.” Instead, “She gives you a piece of paper at the beginning of the semester. And it has Chapter 1, Chapter 2, so on, so forth, and you’re supposed to keep track.” Nate gauged his progress in a class based on the feedback he received on his papers, “He’s written on notes, and I mean, usually it’s a letter. It’s not really as much points-based. It’s just like, ‘This is -- this is what you should be doing. This is fine. You got an A.’”

Some students faced explicit academic expectations from several fronts, encouraging them to use university ICTs. Brandon, a student in Business Administration and a pledge to a fraternity, checked the course management system, “multiple times a day. I’m always checking, making sure that I got all of my assignments done, that there’s nothing coming up I don’t know about, my grades are okay.” He paid close attention to his grades because, “to become an active member you have to get a 2.5. But they’re asking us to get a 3.0 just because it looks really good as a house of having an average at around a 3.0.” Brandon noted that using the course management system made it easier to report his grades in the fraternity. Periodically, one of the active members who kept track of grades, “just asks us, he’s like ‘Hey, is it ok if I check your grades really quick?’ And so we can just sign in and he can click through them and see how we’ve been doing.”

Consequences and Benefits

Students generally reported incorporating the ICTs into their routines, particularly because their instructors actively used them, reinforcing their value. This meant that when students went to an ICT like the course management system, there was information that the

students needed to function in the class. Lisa, a student in Pre-Nursing, found that when her laptop was open, “just usually I have like [Keyboard State] Online open.” Lisa referred to the course management system so frequently because:

They post the PowerPoints, if they have them, online. And the summarization in my music class, like over what we talked about, that's a good reference to go back... to help study and stuff. And, I don't know, just posting grades, stuff like that. It's just easy access.

Brittany, a student in Biology, appreciated being able to access her course syllabi, “I've never had to use a syllabus before... So, it's just like, I'm always checking my syllabus to see what homework is coming up. When the tests are.” Cody, regularly checked his progress, and explained, “I feel like, I don't know, it gives me a sense of security that I know everything's there... And I know what I need to, to make it, you know, maybe improve my grade or if I'm missing anything.”

Some students did not immediately register the importance of using the ICTs in accordance with their instructor expectations. This resulted in the occasional shock, such as for Craig, a student in Computer Technology, when an instructor started class by announcing:

“Hand in the homework.” And I said, “Homework? You didn't say anything homework last class.” “I e-mailed you yesterday.” “Why didn't you tell me you e-mailed me yesterday? I don't look at my e-mail.” He allowed me to turn in it if I could get it in before the end of the day but that's not the point. The point is he should've let me know... I get in the habit of looking...It's my bad.

Professor Bhaer, when counseling students who were struggling academically found that:

The students who aren't doing really well, are struggling... who are just kind of generally ... clueless about some of the basic things that everybody has to do to do well. And checking your assignments and online quizzes and things like that ... is important.

After he guided students to the course management system, Professor Bhaer observed:

A shocking difference, typically...Because, I'll say, "Hey, how are you doing in your -- whatever -- Sociology class?" "Oh, I, I'm doing pretty well." "What does well mean? What grade are you getting and let's get a look at it." And then, they'd

never looked at that before, and it comes up and they are like 44% or something like that. And they go, "Oh, I see I have missed some things," so that's typically how it plays out.

Professionalism

Beyond using specific ICTs in college, students learned about expectations of their etiquette or professionalism when communicating with those ICTs. Many students described an expectation of writing, "professional" emails. Brandee, a student in Open Option, communicated with faculty and staff across campus through email as part of her job. Her supervisor told her:

Be very professional... What you should do is, you know, tell them what you're typing about in the subject, because professors don't want just flip-flop to look through... Just be very nice, get your point across, get your questions out, and it will be fine. So that, she did help me.

Ellen, a student in Microbiology, worried about being professional in her emails, "The wording of it ... I don't always know how to word it like the introduction and stuff." Fortunately, her professor, "Went over kind of the etiquette of how to email them and lines that you don't cross, like you don't put LOL and stuff like that in there. So, that was -- that made it easier I think."

Mingxia, a student in Open Option, contrasted how she was taught to compose emails in China with the advice she received in the United States, "Well, in China, teacher taught us you should say, 'Hello Mr. Blablabla and how are you doing,' and then, then my idea. And here we just need to, 'Hello,' and then idea... Here the shorter the better." Mingxia was also bemused by the "weird" emails that her instructor shared as examples of improper emails, "And I think that's really rude ... sometimes they just, 'Hey, Yo.' You can't, 'Hey, Yo,' your instructor. [Laughter]."

Students frequently referred to the emails their professors sent in response for an indication of whether or not they were "professional." When they heard clear affirmation that their emails were professional or appropriate, the students expressed relief or reassurance. When Brandee saw an email in her inbox from Dr. Smith, the first professor she sent an email, she remembered:

Before I opened it I was going, "Oh goodness, oh goodness, oh goodness. Please be nice!" So I opened it and they were all really nice sentences. And, I remember

I sent them a story and they would send it back and like, "Very nice. Good job!" I was like, "Yes!" Revel in the praise of a professor! [laughter]"

Yolanda, a student in Physical Therapy, also received affirmation of her ability to write a professional email when her instructor responded, "She told me, 'Yolanda, you don't have to keep introducing yourself to me, I know it's you.' I was like, 'Oh, okay.'"

Some professors reported making a conscious effort to advise students of what was acceptable and not acceptable when emailing professionally. Professor Dashwood felt that email was vital to her work with students, "I have tremendous communication with students, colleagues, faculty, but almost wholly with students through email... I use email in a huge, huge portion of my job." She observed, "I sometimes have to remind them that, you know, these are the rules. If I write you, you must reply. So, I work in etiquette, a lot." One of the methods that she employed was:

I demand a response. I will not send them information that I give them, you know, doing my job, without a response from them, a professional response. And, I embarrass them. I walk in and I say, "Did you get email from me?" "Oh, yeah." "You didn't respond." I say it out loud, "You didn't respond." I mean, they're on the spot immediately. And they get embarrassed.

Professor Fforde, when considering the emails he received from students, found that "they tend to be very, very professional in their email contacts. If anyone uses abbreviations that I don't like, 'U' -- say letter for 'you' -- I will tell them that I don't like that, and they don't do it again. Now, I mean, to me, that's not way to write, properly."

Content Expectations

Finally, instructors used ICTs to communicate their expectations about the content students needed to learn. Nate was enrolled in a music course where the professor augmented lectures with recordings from the textbook CD and YouTube. He observed that being able to hear and revisit the music helped him to more clearly understand what his professor wanted him to pay attention to in order to learn the content:

And that is the challenge with all music courses is saying, "Well, this is the rhythm you heard." It's like, "Well, where are you getting that?" And a lot of kids -- or, a lot of -- excuse me, peers in my class struggled with that the first couple

weeks. I think -- I think everybody's falling into kind of a -- kind of a nice little niche that they've -- they're like, "Okay, this is what he expects. This is what he means when he says this."

The use of ICTs like videos or images in other fields also helped students grasp concepts more readily. Bethany appreciated her psychology instructor showing videos in class, "because you get to see like experiments play out and stuff...it's a lot easier to understand when you're like actually seeing it instead of reading it out of a book." Professor Fforde incorporated "research presentations" into his class. He explained:

You want to try to give them a, a sort of bigger view of what their topic is, why do they have to sit and learn chapter 13, and 14, and 15. So, we try to place them in the context of something where it really makes a difference, or it really can make a difference. And give them a sense of, away from the classroom, if you also wanted to do some research, what kind of tools and techniques would you be allowed to use, or could you use, even as a little freshman person? And quite often, we get a lot of students get really excited about that, because they haven't seen that kind of equipment. They haven't seen that kind of software. They haven't seen that kind of specialized technology that would give them information that they could never, ever get in any other way

Students typically felt comfortable about using ICTs when they clearly understood what they needed to use and how to use it. Students learned to meet their instructors' expectations when there were negative consequences for not doing so or when there was positive reinforcement for doing so, such as when their instructors regularly posted grades or course materials. Students also found that when instructors used ICTs to illustrate ideas or theories they were better able to understand their instructors' expectations for learning the course content.

Implicit Expectations

While students learned to navigate the explicit expectations, many of them encountered barriers in the form of implicit expectations. These implicit expectations emerged in several contexts: when their instructors assumed that they had knowledge of an ICTs; when their instructors or classmates assumed that they could use an ICT; or when they could not readily identify a social norm in the classroom. Occasionally, students and their instructors encountered

situations with ICTs that were so uncharted, they had no expectations in which to refer. Negotiating these expectations frequently caused the students stress or anxiety.

Assumed Knowledge

It was the second day of the semester and Abby, a student in Elementary Education, was confused: “People were like talking, ‘It’s on [Keyboard State] Online.’ And I was like, ‘I don’t even know what that is. I don’t know how to get on it. I don’t know how to use it.’” By the third day of classes, Lisa was still “confused in classes whenever they talked about it because I was like, ‘What is this?’” It was three weeks into the semester and Cody, a student in Criminology, had been told by instructors that his grades were posted on Keyboard State Online and was “frustrated because I wanted to see like the grades I got. Like they would, they would get the papers back and they would have the grades but I wanted to see like the total.” Abby did not ask her instructors for more information because she thought it had already been taught in class and she assumed of her classmates, “I think somehow they learned it, and I just wasn’t paying attention or I just wasn’t -- I don’t know.” Ultimately, Abby called her older sister, a junior at the university; Lisa asked a friend in her Chemistry class; and Cody, after asking a number of people, “finally just clicked on the right thing, I guess.”

Some of their confusion can be understood by trying to decipher the messages they were sent by university faculty and staff. For instance, in addition to the course management system, the university posted final semester grades in the student information system (iSIS). When Cody was trying to figure out where to go to find the grades for his assignments and quizzes, “I thought they were on iSIS,” Meanwhile, Mingxia’s professor referred to the course management system by its acronym, KSOL [pronounced *kay saul*]; whereas she had only heard it referred to as, “KS Online. But KSOL, where is KSOL at? And my classmate, “Ah, just KS Online.” Now I know [laughter].” Ellen was flummoxed by the logic of the name, assuming “[Keyboard State] online” referred to the university’s website, “I thought it was just the [keyboardstate.edu.] I didn’t realize it was its own thing... I asked my roommate how she, she got to it, and so she told me.”

Instructors, however, did not always realize their students’ confusion about ICTs that they considered common knowledge. Many were unaware of what the students did and did not know and based their assumptions on whether students asked questions. Professor Eyre explained that during his first class session:

I go over the class, what we're going to do in class and class rules and stuff like that and how the class is going to go and the course schedule... I think they all pretty much know about [Keyboard State] Online and how to use it. I've never heard anyone say, "I don't know how to do that." Or, you know, "How do I see my grades?"

Professor Darnay remarked that she was unsure of what the students knew:

I don't know what they went over in Orientation. This would be actually helpful to know...as a teacher to know what they cover in Orientation...so, I didn't hand, hand out the syllabus, I said, "The syllabus is on [Keyboard State] Online." And, you know what, I might have had somebody open up their computer and go online.

Professors held implicit expectations about students' understanding of other ICTs, like email. Professor Fforde, assumed that students were familiar with email because, "If I know how to use email, they definitely know how to use email." For many students, though, while they understood the logistics of sending an email and understood that it was meant to be professional, they did not know how to write a professional email. Bethany, completed an assignment requiring her to email her instructor professionally but didn't receive any feedback, "I wish I would have...I don't know how professional it sounded." Michael, who Googled, "how to write a professional email" for guidance completing the same assignment, decided that getting a response from his instructor indicated that he had successfully written a professional email, "Well, he answered me... He, he did answer me. So, that's good." By not knowing what exactly the professor meant by a "professional email" before the assignment and then not receiving explicit feedback about their success, both students were left unsure of both the etiquette and their mastery of it.

Even emailing another student could cause students anxiety as they tried to meet undefined expectations for communicating within the university committee. Nate remembered, "I did contact another student about a club, and for that one, I was a little nervous. I was like, 'Wow, I want to make sure I sound, you know, okay.' All that jazz." Before sending the email off, he reported, "I reread it ... a couple times [laughter]. And I was, like, 'Yeah, that sounds good. That's me. Go. Before I lose my mind again.'"

Assumed Proficiency

Craig, a nontraditional student, discovered that his instructors and classmates held implicit expectations about what ICTs all students could use. He recalled the first day of classes when his desktop computing instructor outlined the course for the semester:

And I was embarrassed when, ah, PowerPoint came up, to be honest...I think it was the first day, she said that we're going to be going over Word first, Excel, Access, and then PowerPoint. And she goes, "Everybody since kindergarten has been using PowerPoint." And I was like, "Not me." And she goes, "What?"

Craig revealed, "I've never even, even touched PowerPoint, but apparently people do that in 6th grade now." Craig continued to face situations when his proficiency with ICTs did not match the expectations of others, such as when he was paired with a classmate for a speech:

And he, he wanted to do a PowerPoint presentation...I tried to talk him out of it only to save my -- some of my face, you know. I didn't want to show I did not know how to do PowerPoint. And, I mean they just expected me to know that. And I didn't.

While Craig's proficiency level with ICTs like Office could not have been completely unusual, some students and faculty shared the same assumptions about student ICT proficiencies as his desktop publishing teacher and speech classmate. Professor Bhaer remarked that he believed all of his students knew how to use PowerPoint, "better than I do, anyway." Professor Eyre could not recall a student speaking up in class: "They-- no one, no one has ever said, 'I don't know how to use PowerPoint.' Everyone has-- everyone seems very comfortable with the PowerPoint." Many traditional-aged students assumed that their classmates shared their knowledge of ICTs. When Nate worked on a group speech, he felt that everyone was proficient with the ICTs: "Honestly, everybody really knew what they were doing. Everybody had typing classes in, in second grade or whatever it was way back when. And, nowadays, everyone texts. Everybody uses their school email." He went on to say what he expected: "If I know how to use a technology, I'm certain that most other people know how to use it, unless it's -- unless it's a rarer breed, I guess, in which case, I don't always expect people to use it." Rachel stated that

“most college students to know how to print things and probably just software like Microsoft Word and Excel.”

Learning the Social Norms

When students started classes, they found themselves in a new ICT environment where they were not always sure of the rules. Jacob’s first day of classes in college “was really awkward.” At the start of his first class, he reached for his laptop and then froze:

I didn't know if it was okay to take notes on a laptop, so I was like scrambling -- trying to find some sort of piece of paper in my, in my backpack because I totally overlooked the fact that not everyone would have a laptop and so it felt kind of weird pulling my laptop out when there's -- I mean, maybe only a couple of other people in the whole lecture hall.

Jacob, a student in Psychology, graduated from a high school where all of the students were assigned laptops on the first day of freshman year and used the laptops in almost all of their classes. In that moment of reaching for his laptop, Jacob realized: “For the last four years ... I was kind of in my own little bubble and like it was normal for everyone to have laptops, but like now that we're outside of [that] bubble, like I don't know what people would think.” Jacob’s agony of laptop indecision was cleared up when “in one class, it was like after they went over the syllabus, then there was a question from a student about if we can use laptops,” and in other classes, “once I started seeing more people take their laptops out and taking notes on there it definitely got a lot more comfortable.”

Unexpected Situations: Unarticulated Expectations

Finally, some students and instructors encountered implicit expectations that existed because the way that the ICT was used was so unexpected, it never occurred to the instructor that he or she would have to explicitly state that the behavior was not acceptable. Although unusual, this study did uncover two instances when students composed papers on their cell phones. The writing was more extensive than Bethany’s method of using her cell phone when, “I’ll just like if I get like a thought like -- if I’m not at a computer I’ll like type it in my phone and then I’ll go back and then write it out.”

Cody discovered in high school that:

I could type out a paper and then it would automatically send it to my email... And I could just print it off so, like if I was in a hurry and didn't have time to sit on a computer, I could just type it... pretty much text it out and then it would type it up.

He noticed, however:

I think I did it worse on the phone, 'cause I think I associated it with texting and so a lot of times when I'd look at it in my email, I would have, I don't know, texting language in there, I guess. And I'd have to fix it, but. I saw my thoughts weren't as complete through the phone and that was pretty interesting.

Through the interview, it was unclear whether Cody ever submitted a texted paper without revising it. He explained, "The only reason I ever really used it was... we'd be driving somewhere and I wouldn't have anything else to do so I might as well start writing the paper."

Professor Dashwood did have a student submit a texted paper. Her first indication that something was different was the peculiar writing style,

I was grading this set of papers at home and I pulled up this paper and I read it, and I read, and I read, and I showed it to my husband. I said, "Isn't there something really strange about this?" And, it was so vacuous and so idealist. It was the bare bones of the assignment, just barely hit. And the level of vocabulary -- it was just like reading something that was written -- I, I can't even describe what it was like.

Professor Dashwood spoke to the student who submitted the paper after class and learned that the student texted the paper to a friend because her printer was not working. Realizing that the paper had been texted placed the writing style in context for Professor Dashwood,

What came out was so vacuous ... because that's the medium. And, you know, she would type some little abbreviated thing, "My grandpa was, was in Korean War." And it would come out that way. ... [W]hat I was really reading was a collection of snippets... there was no coherence from one sentence to another, because as she's texting, she can't go back and look at what she's written. It was a collection of snippets. And, I didn't get that. I didn't get what my reaction was like until I knew what it was [laughter].

When students encountered implicit expectations, they described feeling anxiety or embarrassment. The negative emotions resulted from not being able to meet an explicit expectation to use an ICT. Students also expressed stress when placed in positions that revealed that they did not conform to class norms, such as feeling that they were the only student who did not know how to use an ICT or that they were using ICTs in a way that was different from everyone else. Due to the evolving nature of ICTs, students and faculty occasionally encountered situations that were so outside the norms that no expectations had been articulated, let alone communicated.

Expectation Dissonance

Students expressed frustration when their expectations about how ICTs were to be used did not align with their instructors. This dissonance typically occurred when students thought that they understood the explicit expectations but their instructors acted in ways that did not correspond to those expectations. Instances of dissonance included when an instructor did not hold up his or her end of the bargain; instructors did not model the behavior that the students were expected to demonstrate; or students felt that an expectation was unreasonable.

Instructors Not Meeting Expectations

Students learned early in the semester that they were expected to track their grades on the course management system and to read their university email regularly. However, some students encountered instructors who did not meet the reciprocal expectations of posting grades or responding to email. Bethany, an 18-year old student in Open Option explained, “I have one class where like he, he never puts up grades and so I'm just like, ‘Mmm. I don't know if I'm doing good in this class.’ Like I don't know if I should study harder. So it's, it's like -- I feel kind of like lost.” Even after being asked by the class to post more grades, Bethany noted: “But he doesn't put everything up. He'll put like quizzes up -- like the big stuff but he won't put up like homework assignment grades. So like you get -- you get some of the picture but you're still kind of like wondering.” While Abby felt comfortable emailing her instructors after she got to know them, she would not consider emailing one of her instructors because, as she said, “I know one never responds to his email so I just don't even [laughter].” She explained, “Yeah, this one girl was gone for like two days, and she emailed him and ... asked him like what should she do, and he never responded.”

Professor Xavier indicated that this dissonance was felt on the instructor's side, too, identifying a tension between student expectations and faculty expectations about the primary function of the course management system. For instance, Professor Xavier would ask in class, "How many people have signed in to [Keyboard State] Online and checked the announcements and stuff today?" And not very many people raise their hands." On the other hand, he said, "If I don't post grades right away or current participation progress then they're like, 'Well, where is...where are those things?' You know, 'Why don't you that information available to us? Cause we're checking and checking.'" For Professor Xavier, then, the course management system was important as a way for him to communicate with his students, while his students wanted to know how they were performing in his class.

Instructors Not Modeling Expectations

While students understood that they were expected to be professional when they emailed their instructors, students discovered that their instructors did not always model that professionalism in their emails. Christine, a student in Open Option, was surprised by some of the email responses she received: "Sometimes I'm like, 'Oh, I have to be all professional, but then you just send to me like nothing.' ... I mean, that's fine. It's whatever. They're the professor." Jacob, after being impressed that his instructor emailed a response within seconds, noted a disparity between his own efforts at drafting an email and the response he received:

It was more informal than I expected but, I mean, it wasn't really a in-depth question... I think he just responded, "Times New Roman would be great," and then he just signed his name. So, I mean it's the information I wanted.

Nonetheless, Jacob did not intend to relax his style in future messages, "No, I still proofread. That's, that's kind of how I am with like any emails."

Unreasonable Expectations

Some students expressed frustration when the expectations of using ICTs in a course were contrary to what a student thought that they would encounter in college. Abby and Brandee were surprised that they would be watching lectures online for a course outside of classes. When asked if she knew when she enrolled that so much of the class would be online, Brandee responded, "Oh, no I did not! He said we had lectures online. I didn't realize it was eighteen

lectures. And all of our quizzes and all of our exams are online.” Abby was unhappy because the course expectations did not align with what she thought she would be required to do in college:

I know it's not unusual here, but the first year it's kind of strange... I was getting frustrated. I was already like upset because I feel like this is a three-credit-hour course, so I shouldn't be doing all my work at home. I guess I didn't really understand how the credit hours worked. I understand now.

While Brandee was still not happy about how much of the course was online, her instructor redeemed himself by providing explicit expectations of the coursework, “This guy's so organized. He gives us tasks lists. So it's so nice to be able to look and be like, ‘Oh! This is what I need to do this week.’”

Students expressed frustration or annoyance when they found themselves experiencing conflicting expectations. A primary source of that frustration appeared to result from the fact that instructors were not following the rules, or explicit expectations. Students were surprised to discover that some of their instructors did not demonstrate the behavior that the students were expected to learn and demonstrate. Another source of frustration resulted when students discovered that their own expectations for what they would be doing in college would not be met.

The expectations that students learned regarding their use of ICTs helped them understand what it meant for them to be students at the university. When instructors clearly articulated the expectations and reinforced those expectations by using the ICTs in the manners that they said they would, students adapted those ICTs into their academic routines. Students typically accepted alterations from the university norms by individual instructors if they were explained or the students were offered alternatives. Students expressed anxiety when they were unable to decipher implicit norms, particularly when they could not meet explicit expectations, they believed that they were missing information that was obvious to others, or when they were in situations where they realized that they were not in accordance with the explicit norms. Students described feeling frustrated when their instructors did not meet the explicit norms that students had been taught to expect. When students believed they understood the ICT norms, they felt confident or comfortable using the ICTs. When students were still negotiating the implicit expectations or experienced dissonance with those expectations, they felt uncertainty and stress regarding the ICT norms.

Locus of Control

When Bethany reflected on how she interacted with the course management system, she realized that using it made her

feel more responsible but less responsible. Like when I see my grades I'm like, "Okay. I need to do this and blah, blah, blah." I feel like whenever professors like email me to remind me about stuff, I kind of feel like I don't have to remember because I know my professors are going to remind me.

Bethany's reflection encapsulates the dichotomy of control or responsibility that students expressed regarding their use of ICTs for academic purposes. This dichotomy may be expressed as an external locus control or an internal locus. When someone has an external locus of control, they "may conclude that fate has determined their course," (Kuh et al., 2006, p 13). When in the university setting, an instructor may occasionally assume the role of fate. When a student has an internal locus of control, they may "believe that they can work their way through situations" (Kuh et al., 2006, p. 13). Students using ICTs for academic purposes, then, encountered situations when their instructors determined their course; when they felt that fate or something out of their control determined their course; or they themselves determined their course.

External Locus of Control

Students assumed that their instructors or fate determined their course in situations such as the classroom, working with online homework, or when an ICT malfunctioned. Occasionally, students wanted an outside force to assume responsibility for creating consequences for the students' actions or the outcomes of their actions. Students expressed frustration or powerlessness when they felt that their actions or the outcomes of their actions were out of their hands.

Instructors Control Course ICTs

Students predominantly relied on their instructors to determine the rules and guidelines for ICT use in the classroom and for coursework. Michael indicated that he felt his role in the classroom was to "just sit in my chair and do what I'm supposed to do [laughter]." Mingxia commented that she would not ask a professor to use a specific ICT in a class because "I'm a freshman and the class is not that hard." However, she thought she might "when I'm a junior or senior." In contrast, while students in the study indicated that it was not their place to question

the class rules, instructors reported students questioning their decisions or asking them to do something differently. Professor Xavier noted that when he decided not to use PowerPoints in class, “actually, students have come, approached me and said, you know, ‘Professor Xavier, I have a hard time paying attention or knowing what's important unless I have that technology display available to me.’”

Students found that when their instructors established consequences for not attending class, the students were more likely to attend lectures. The students typically described these rules as kinds of exterior motivators, indicating that they would be less likely to go without the repercussions. One of Abby’s instructors “does surprise pop quizzes, and you need a password to get in...He gives it in class.” Without the pop quizzes, she said, “I'd have a harder time going to class. [laughter]...I think I still would, but I would just -- because it's nice to have a teacher explain it to you also along with the slides.” Cody found that when a professor did not post the PowerPoints from class on the course management system:

I feel like that... makes me make sure I don't miss that class, if that makes sense... Just because, I know if I don't go I know there's no way of getting the information besides asking someone. And there's a lot of information.

Professor Fforde explained to students who asked that he would not post his class notes online because he felt it ensured a level of learning for the students,

I like them to come to class and actually physically sit there and write. I think there's some benefit in actually putting pen to paper, or taking that information down...I think it is, I think it is well-established that you learn more that way as opposed to just getting a piece of paper that -- it's like photocopying something. I have a bunch of articles that I photocopied. I certainly haven't read them. But I think, if you have to sit there and write something, there is, there's something mechanical and there's a muscle memory, you see it over and over again. So, purely from that point of view, I don't hand out my notes.

Professor Eyre’s approach to class notes online split the assumed responsibility for students to attend class between him and the students. He posted the “class notes” and “handouts” that he gave students on the course management system, but they were incomplete, necessitating that the students attend class for the full lecture. Once in the classroom, however, he placed the impetus for recording the pertinent facts on the students:

I give the students a hard copy skeleton of that day's presentation. So, I, I don't put everything on their handout, but I put the key concepts I want them to get that day. And I leave it to them to decide what they want to write down as far as all the trivial facts that support, you know, the concepts. I say that, you know, "Don't write down every single word I say. But, you decide what you think is important."

Online Homework Constraints

Many students learned that they were required to complete online homework for their classes. For some students, submitting their homework online meant that they lost control over their learning process. Ellen did not "really like having to do it online." She said, "I'd rather do it in class or like a hard copy." By submitting the homework online, she realized that her instructors could not, as she said, "tell me what I'm doing wrong whereas, like if I had it all written out they could say, 'This is the step you went wrong in.' You know, otherwise it's just I have...I know I have the wrong answer, but I don't know why. So, I don't really like that."

Online homework and quizzes, particularly in math and the sciences, required students to pay close attention to guidelines for entering their answers. Professor Fforde explained the intricacies of entering an answer in the online homework system:

It could be difficult, because we have something called significant figures. So, you need a certain number of decimal points to get it right. And if you have too many decimal points -- for example, if you just write down the answer that you get in your calculator, that's incorrect in some circumstances, because you only write -- allowed to write down two decimal points. So, if they get that wrong, they get the whole answer wrong.

Due to the automated and precise nature of the online homework, students sometimes felt that getting the system to recognize the format of their answer sometimes mattered more than their ability to complete the problem. This occurred to Daniel when he attempted to complete an online assignment using the homework system described by Professor Fforde. Daniel thought that the program was, "too finicky":

You can make one mistake you know, you put the line up here instead of down here and the thing won't accept it and you won't know why... So, it was a really frustrating assignment, because you'd sit there and draw one atom or one

molecule four times... Get it wrong each time until the last one. You'll sit there and go, "I don't know what I did different. It should have been the same."

Daniel and his classmates later learned that the online homework malfunctioned, essentially proving in that case that it did not matter how hard he worked to solve the problem.

Malfunctioning Technology

A surprising number of students in the study experienced dying or malfunctioning laptops and computers during their first semester in college. Some of these students demonstrated a kind of resigned acceptance of the malfunctions, indicating that there was not much that they could do. Michael's laptop did not always work because, as he said, "A few of the keys are broken...so that doesn't help. It's kind of annoying... Just slam on the comma" and his desktop computer "sometimes screws up... Like it just likes to randomly freeze. It's not nice... Especially when I'm typing papers." Michael speculated, "I feel like it's the power source. But, I don't know anything about computers, so I have no clue." He asked his older brother, a programmer, for advice: "He's smart...And then I got a couple of other opinions from people on my floor...Nobody that could actually figure it out." He was waiting to ask for real help "when it becomes too much of a problem." Abby's hand-me-down computer was both slow and "then like it just like went through my hard drive and just erased everything." She did not go to anybody for help "because it happened on a Sunday and the help desks weren't open, were they?" While she persevered through the semester with the old computer, Abby's long-term plan was as follows: "I probably will buy a computer at semester because this computer's just not working out for me."

When students encountered a campus-wide ICT that did not work, they sometimes felt especially out of control. Cody indicated that one of the things he struggled to figure out during the semester was the intermittent availability of the internet in his residence hall:

When I'm doing, like, a quiz or something online, and it goes out, it's kind of annoying... And some of them are timed. And the time doesn't stop, so. I've had one where I couldn't get back on the Internet period. I kind of, I failed it because I couldn't -- I had no way to do it.

When he asked for technical help, he said, "They just said because I...[my dorm] is like farther away it goes and comes back in sometimes. So, there's really nothing I can do, they said."

Unfortunately, when he talked to his instructor, “He said I should have been better prepared, but I don't know how that would have...I don't see how that could have worked out.”

Sometimes, students simply felt like no matter how hard they tried, they had no control over the outcome of a situation. Christine found that even having guidelines did not alleviate her anxiety about emailing an instructor:

I'm always -- like, I know the professional format of, like, how to email a teacher. Like, [my professor] went over that pretty well [laughter]. So, I was like, “Okay, I got this.” But it's still, I'm like, “Oh, what if they take it the wrong way?”... I don't even know how they could, and stuff, but [laughter]... I mean, they probably don't really, you know, pay attention that much, just answer the questions.

Students demonstrated an external locus of control when they acquiesced to the instructors' rules for the class and relied upon those rules to moderate their behavior. Students found that online homework systems could produce frustration when it constrained their learning. When students did not know how to resolve malfunctioning ICTs, they expressed resignation and helplessness.

Internal Locus of Control

Students demonstrated an internal locus of control when they felt that their actions or decisions affected the outcomes of their learning or their control of a situation. They demonstrated an internal locus of control when they made decisions about attending class, participated in in-class activities, took the initiative for using ICTs to benefit their own learning, and resolving problems when ICT malfunctioned. Due to the fact that they were in an academic setting, students encountered some situations when they could only feel like they controlled their decisions or outcomes because their instructors provided the leeway for them to do so. Students who demonstrated an internal locus of control could express satisfaction or distress, depending upon the situation and its outcomes.

Attending Class

Several students made decisions about whether to attend classes or not based upon whether their instructor placed the course notes online. As discussed above, some instructors refused to do so because they felt it encouraged students not to attend class or to be as engaged in the class when they did attend. However, when an instructor made the decision to post the notes

online, students felt more empowered to make decisions about attending class. Erica stopped going to two of her classes when she came to the conclusion, “Why am I going to go to class, if I can read the PowerPoints and the extra points that you're making but I basically have to teach it to myself anyway?” With one of the class she skipped:

I haven't gone to a class since the first one -- since the first exam...but I have gone to the tests, and I still have a high C in that class. I get all the weekly quizzes done, I get 100s on all the weekly quizzes, so it's kind of like, I'm still doing good. What's the point?

However, Erica acknowledged that she would probably need to start attending the other class “just because my grade isn't great in that class right now.” Bethany sounded as if she wanted to shift the locus of control back to her instructors so she would not be as responsible for her decision

because when they put them like online, I usually don't go to class... I'm like, “Oh well,” because a lot of times they just read off their PowerPoint. So I'm like, “I could do that in my room, like I don't need to be there for them to read it to me. I could do that like by myself.”... So yeah, I'd rather them not because then actually I'd have to go to class and it's probably good to go to class [laughter].

Students who attended class when the notes were online described internal motivations for doing so. Jacob figured, “I could easily like just not show up to that class at all and I'd be doing fine,” for a class where the notes were posted. However, he decided to attend class because he liked his instructor’s personality, “the only reason I go to ... that class is because he's like so animated and he's just kind of goofy.”

Participation in Learning Activities

Occasionally, instructors encouraged students to take control of their learning in the classroom. As with those instances when students chose whether or not to attend class only after their instructors decided whether or not to post class notes, the students locus of control was technically reliant upon the instructor granting them that control. Professor Darnay encouraged students in her first-year class to incorporate their own ICTs during class discussions, “I have them use their smartphones for, for web lookup stuff.” She described how students were able to contribute to the content of the course when looking up information:

They are all looking up to see what they find, "I found this," "I found that," you know? Also we did a food diary after the film of "The Hungry for Change." And a couple of people had food diary program on their phone. And they, you know, they say, "Can I use this on my phone?" I said, "Sure, you have your phone with you when you eat, right?" "Well, yeah. Of course." So I said, "So, then ...use it."

Professor Darnay clarified that all students were not expected to use smartphones or laptops during class, "I haven't made using technology into the classroom a mandatory thing. It's more a voluntary thing." Professor Dashwood similarly created an environment when students could assume responsibility for their learning:

I use a lot of visual information and the control they have is, you know, I put it up there and I'll say, how many of you need to look at this longer? Do you have it? They feel that they have a right to stop it and say, you know, "Can you leave it up there?" "What did you say here?" And I get more honesty that way from students. They're willing to tell me stuff.

Students who were in classes where they could actively participate in the course content, using feedback response systems like clickers, enjoyed having some control over their learning. Rachel described it as being "fun to be able to just submit your own answer and see how well you're doing constantly and also see how you compare to the whole class and it provides good discussion." She also liked the sense of competition: "I never want to get any wrong. We usually get some extra credit, so I try to get them all right and just kind of compete with myself to see how well I'm listening."

Taking the Initiative for Learning

Many students felt comfortable relying upon themselves to learn, apply, or adapt ICTs when completing their coursework. While online homework could be prescriptive, some students felt confident in their ability to decipher clues to complete the homework properly. Samantha worked out, "you're mostly entering numbers, and it'll tell you how to write, like squared or square root of. So, like, you have to pay attention to make sure you're entering it right... if it's anything more complicated, it'll have like a box, and then a box for...the inequality sign, and then a box. So, I mean, it's not very complicated." Daniel, who liked doing his online calculus homework, explained:

There's no instructions I guess, but the-- it's not really horribly confusing either...if I remember correctly they write their questions with like the “ x^2 ” ...That way you get the idea you have to write the answer in “ x^2 ,”...it's usually not just a, ‘You're doing it wrong.’ It's a, ‘Pay attention to how they did it,’ and then copy that same format.

Several students developed alternate learning methods to help themselves complete an assignment or pass an exam. When Michael interviewed the second time, he had just completed a Geography test that he thought he preformed well on, partially because he added his own study method to the typical course-generate ones. He started with “the study guide, told me everything I need to know. Then, I go through my notes and highlight everything that I need to know. It's a good idea to do that.” But then, he called on his fondness for gaming, “like I have to know where things are on the map....I just Google search like, ‘South America countries game.’ And then, you just place them where you think it'll be...It helps, a lot. [laughing]” He first came across these types of games because, “I used to play a bunch of, like, Flash games. And one of them that popped up was like, ‘Do you know your states?’ So, I would do that. It's like, ‘Wow, this is...I wonder if this can be applied to other places?’” Ellen realized that she could take control of her learning when she became frustrated searching in the library databases for an assignment: “It was really hard to find exactly what I needed because so many other things were coming up in the database.” She ultimately decided, “It was easier for me just to look up like a book on this subject and then go find the book, which I ended up doing that...Like I found one...using the database, but then I used the catalog and found the book.”

Craig was invested in his learning and frequently took the initiative to ask for clarification or to develop systems that helped him feel more confident in his learning. When the semester started and so many students were trying to figure out what their instructors meant when they said, “Go to Keyboard State Online,” Craig was the only student who reported asking an instructor, “Could you explain that to me? I, I don't even know what you're talking about.” A former trainer at a manufacturing company, Craig explained that he asked because, “I'd rather -- me from an instructor knowing your limitations...If I know what you don't know, then I can teach it... If I think you know everything, get out of my class.” Craig also anticipated a steep learning curve in his desktop computer class and purchased a copy of the software program the class used prior to the start of the semester. That way, he could “take it home to play with it, so I

wouldn't seem so stupid when I got to class. Because, if I did not have the Office at home, I can see me raising my hand in class every time she did something.”

Other students also learned to take the initiative and contact their instructors when they needed information such as to clarify an assignment. Brittany remarked that she was very comfortable emailing instructors: “I almost email teachers every day.” Bethany held a prosaic attitude about emailing her instructors, “you email them if you need to know something and if you don't email them you're not going to -- I mean you could ask them... But if you don't talk to them you're never going to find out. So it's necessary.”

Resolving Malfunctioning ICTs

Yolanda demonstrated her belief that she could work her way through situations when her new laptop died a couple of months into the semester: “It was ... the first computer I had...in the middle of a assignment, and it like “Blue screen!” I was like, “Are you freaking serious!” I was like so upset! So, I like threw the laptop on the floor.” Yolanda also, “called my mom. And I was crying and I was upset. She was like, ‘Oh, you'll be okay’... I wanted her to be like, ‘That dumb computer.’ And be mad with me. [laughter].” Despite being upset, Yolanda remained proactive and sought solutions to her dilemma. The first was completing the assignment that she had been in the middle of on her roommate’s computer: “Thank God, like [Keyboard State] Online saves like what you're doing... So, like, it didn't take me long, it just restarted me from a point where it like cut off at.” Then, she took her laptop to the campus IT help desk, and as she said, “And they were like, ‘Oh. Again, it's messed up.’” Her final step was to take it back to the computer store, or, as Yolanda described it, “I like threw it at the people at [the computer store] and I'm like, "Give me a new computer now. Now. [laughter]"

Students demonstrated their beliefs that they could work through situations when they made conscious decisions about their learning. Furthermore, students demonstrated an internal locus of control when they developed their own methods of learning. Additionally, students engaged in problem-solving activities.

Students approached ICTs in college from an external or internal locus of control. When students acknowledged that their instructors were the central force in establishing the rules and guidelines for the use of ICTs in the courses, the students became limited in being able to demonstrate an internal locus of control to those times that were outside of the instructors’ control, like studying, or to those times when the instructor granted them or encouraged them to

take responsibility for their learning. Students did not always consider an external locus of control a bad thing, particularly when they felt they needed someone else's rules to encourage them to make good decisions. Conversely, when a student took the initiative and worked their way through a situation, the stress and anxiety from that situation could be highlighted for them over any satisfaction that they might feel in resolving the problem.

Social Integration

Starting college meant a student had the opportunity to find a social environment that was “congenial with his or her preferences” (Kuh et al., 2006, p. 11). Students used ICTs to create or find these congenial environments in three ways: by creating bridges back to their families and friends away from college; as a social lubricant to assist in making new friends; and to socialize with their new friends in college. Traditional-aged college students also brought with them a rich set of mores relating to cell phones that affected how they engaged with their peers.

A Bridge Back Home

Samantha described her role in her family as the communicator and took a lot of care in staying connected with her family. She stayed in touch with her ten-year old sister through Facebook:

Our stepmom said she could get a Facebook, but she can only be friends with family...So, we message her... she said that she was really glad...so that she could still talk to us 'cause she's the oldest one besides us. And, it was kind of hard for us leaving.

Samantha shared photos and videos, because as she said, “I like to be able to show them, like, the places I see every day, and if we make a funny video, or be, like, ‘Hey, look at this.’ ...I like to be able to help them understand what's going on here.” Samantha's oldest brother, who lived in another town, extended a bridge to her and her sister in college by offering his own brand of support via texts:

Like he, he kind of makes fun us. Like, when we moved out, he was like, “Have you broke down crying yet?” I'm like, “No.” [laughter] I don't know, he's always like, “Have you been hanging out with people yet or are you just staying in your room?” And I'm like, “No.” So, I mean he, I don't know. He -- I guess, maybe it's his way of like making sure we're okay.

Facebook served as a way to track friends from high school or back home without necessarily requiring active engagement, much like reading a Christmas letter, for students like Brandee and Ellen. Brandee explained:

Pretty much all of my family and friends, I will lovingly stalk and make sure they're okay. [laughter]... I comment sometimes on my best friend's wall. And I comment on my boyfriend's wall. That's about it... I don't talk to a lot of people on Facebook. I just kind of make sure they're okay.

Ellen added a few new friends from college as friends on Facebook, but she primarily used it to “look at people from high school or relatives. Just to kind of see what they're doing now.”

Students who wanted to actually see family and close friends favored video-chatting with programs like Skype and Google+ Hangouts. Jacob Skyped friends because, “It's one thing to be like talking to someone or for texts, but it's another thing to actually see them and like hear the tone of their voice and see their face and see how they're doing.” Mingxia talked to her mother in China on Skype and found it helped them to stay close, “We can see each other and listen [laughter].” She was also able to introduce her mother to her roommate and provide a tour of her room, “And this is my bed. This is the wall [laughter].” When Christine came to college, she and her best friend continued a ritual with Skype that they started the year before when her friend moved away for college,

We do this thing where like Hulu, you know that? We watch the show “Pretty Little Liars.” And so, she would get that up on Hulu and I would watch it on DVR and we would watch it together while Skyping. So, kind of like, you know, sitting -- kind of like we were watching it at the same time... And then, we would Skype and just talk about our lives and stuff.

Christine believed that this ritual helped their relationship as best friends: “It's like good to see their face and like actually be able to like hear their voice and stuff like that.”

Ellen experienced technical difficulties trying to Skype with her two best friends from high school, so they switched to Google+ Hangouts, which also presented technical problems, “So, I had to be on the phone talking, while seeing them and them seeing me. But it was nice being able to actually see them and talk to both of them at the same time.” Despite the technical issues, Ellen and her friends talked for

about an hour and a half... Yeah, we weren't supposed to go that long... We were like, we should only do it an hour... But I think having the face connection there, if there was a pause in conversation, we were more likely like to come up with something else, kind of like you are in person.

Although they wanted to video-chat, sometimes technical issues got in the way for some students. Daniel was discouraged by the difficulties he experienced with Skype: "I'd probably do it more if I had better internet connection. The connection was jumpy. So, the one-- the time I was using video, the video was not very clear. It would freeze and start and freeze and start." Erica wanted to Skype with her best friend but gave it up because, as she said, "Skype is nearly impossible to use in the dorms... The internet connection is so awful that's it's like in and out every like 30 seconds."

Texting and calling remained a standard way to stay connected with friends for many students. Lisa noted that when trying to contact her friends from high school, "It's hard to find a time where everyone... where I can Skype with them. So, usually I just text them here and there." To include everyone in the conversation, they used an app on their smartphones: "It's basically like group text messaging, but it's like an app and so you can, I don't know, it just like shows the person talking and stuff, kind of like a chat room."

Brandon stayed in contact with friends through his Playstation 3 (PS3) gaming system: "I'll play with some of my friends from back home that are all spread out all over the state now... [The] Bluetooth headset, hooks right up to the PS3 so we can kind of talk back and forth, too, so that's nice." While they're gaming he and his friends will chat,

Usually it's about personal stuff, about, you know, what's going on with us, what all we've been up to. Kind of like that. Every once in a while, though, we'll get back on to the subject of the game, but it's usually just kind of messing around and laughing with each other.

ICTs sometimes offered students a way to introduce their new friends to their old friends. Brandon used the game as a bridge between his old friends and new ones, "I had one of my pledge brothers, he played with... us and we all just kind of talked and laughed, so it was fun." Abby, while chatting with a friend from home on Skype, took her laptop around her residence hall floor because her friend "wanted to meet everybody on the floor. So, she met everybody on

the floor.” Her neighbors were un-phased by the virtual introductions. She said, “They're used to it. People do it a lot.”

Students used ICTs to remain connected in varying degrees with “home.” The closer the students were to their friends or family, the more they wanted an experience that emulated being in person. ICTs like Skype also allowed students to bridge home and college because they supported interaction between the people back home and those in the room with the student.

Social Lubricant

When starting college some students, like Lisa, found it to be “kind of a rough transition just socially,” especially since she was enrolled in so many large lecture classes. She said, “It's hard to meet people when you're in a class with like 400.” She struck up conversations with people sitting nearby in her classes, but, “it was really weird, I felt like I was dating. Not dating, but, I don't know, it was weird ...I felt creepy in a way, but, I mean you have to [laughter].” Students turned to ICTs like Facebook or their laptops as a way to ease their entry into their new social terrain.

Cody chose Facebook to break the ice. He said, “If I wasn't able to add them on Facebook first and then start to...talk more, I don't know that I would have as many like new friends. Just because, I don't know, it's weird to go up and ask someone for their number right off the bat.” Bethany talked to classmates more after friending them on Facebook, too: “I don't know why that is, but I guess because you like know more about them without knowing more about -- I don't know, like you seem closer to them just because you've like -- you've seen their Facebook.”

Students also discovered ways to use ICTs as social lubricants in-person. A laptop in hand ensured that there was something happening or to do when hanging out with a group of people. Daniel described the lobby in his residence hall:

There's almost always a laptop out in the lobby. Someone will have a laptop and usually that person's playing music. And depending on the time of day you can have anywhere between that one person having it to everyone's got their laptop out... There's a lot of people using, what is that website, Pinterest... a lot of the girls when they have their laptop out, have that up and are looking through pictures and they're showing each other pictures and things like that. There's a lot of it.

A laptop could also act as a type of security blanket, such as for Bethany, whose residence hall lobby was a social and technology hub, too. She would head out to her lobby when she wanted to talk or she didn't, "feel like being in my room by myself, yeah. So I'll go out and like socialize... But I'll have my laptop with me [laughter.]" She would not go out without her laptop: "If other people weren't on their laptops, I would. But if everyone else was on their laptop I'd feel like...left out?... Not left out -- but like...different."

Facebook helped students who lived on the same floor in a residence hall to become, as Brandee called it "a nice, pretty community." She attributed the creation of the Facebook page to "our seventh year senior who lives on our floor... Yeah, he set it up so that we could all kind of keep track of each other." She found that:

The first week of school it was kind of, everyone was off being crazy. And they come back, "Well, where were you?" "At this really cool event being held down here." Like, "Oh, well, didn't know about that." It's like, "Where were you?" "I was sitting at home! Doing nothing." So they created the webpage so that everyone could one: find out who we're living with; and two: find out what's going on on campus. It seems like everyone knows what's going on on campus. It's amazing... I went to the first football game through that... And then, they let them know like some...our floor has big groups of people watch movies together. So, they let them know who's watching a movie or there's something going on at the Union or something that interesting that they think the rest of the floor would like to go to. And, sometimes it's like, "Hey, I'm going home this weekend." Or, you know, "Could someone go feed my fish or make sure my roommate's feeding my fish."

Brandee's experience with Facebook and her residence hall provides a clear picture of how Facebook could make it easier for students to meet the people around them and enter the social environment on campus.

Students turned to ICTs to help them through unfamiliar or potentially awkward social situations. Students found that it was easier to start a conversation with someone that they did not know well if they could call on information about the person that they learned on Facebook. When the social norm of a community included having an ICT on hand, then a student following that norm could feel more apart of that community. For first-year students who did not know a

lot about the social opportunities at a university, an ICT like Facebook offered them entry into that world.

Socializing With Friends

Within a student's circle of friends in college, they developed norms about how they would use ICTs with each other. Students used ICTs as a means to touch base, to share jokes and feel part of a community, or when hanging out. Some students found that the college environment permitted them to use ICTs less than they had before coming to college. Students also found that ICTs had minimal impact on their feelings of fitting in at the university.

When students were asked what ICTs they expected their friends to use, or what ICTs their friends expected them to use, they predominantly responded, "cell phones" and "texting." When Mingxia thought about how she communicated with friends, she realized:

I rarely use the Twitter, or Facebook, or Wei Xin¹. Yeah, I don't know why. I -- in China I use Weibo², microblog a lot, but here I don't know. Maybe it's pointless, I think. If I have something to talk, I just call them, "Let's talk."

Jacob explained, "Mainly cell phones, that's definitely the big thing with friends. You kind of get hounded if you're -- if don't answer calls or don't answer texts after a while." With the cell phones, students like Mingxia, alternated between talking and texting, depending on the circumstances: "If I have a lot of thing to say, I want to just talk instead of typing. If I just -- 'Hey, are you free at what time?' Well, I, I would like to use message." Nate and his friends texted each other, although he found that when he was texting friends at college: "It's more to meet up so that you can have that face-to-face." The cultural norms that arose surrounding the use of cell phones by traditional-aged students were so striking that they are more fully addressed in a separate section below.

Several students reported migrating from Facebook to Twitter to stay in touch with friends. Brandon explained,

I don't ever really use Facebook much. I use Twitter a little bit just to, if we have an inside joke or something or something that reminds me of them, I'll Tweet at them really quick, but that's about it.

¹ Wei Xin is an instant messaging app used in China

² Weibo is a microblog site, similar to Twitter, in China

Abby's floor in her residence hall used Twitter to strengthen their community. She learned of a Twitter hashtag for her floor from

a girl in my sorority [who] lived on [my floor] and she had that hashtag last year, so it came down through us, too. So, now it's just going to keep going on...I told my floor, and they liked it. So, it's our floor hashtag.

Many students integrated ICTs into the socializing when they were with their friends.

Nate shared:

I've invited friends over to play, play Halo...Me and my buddies will go on a website called StumbleUpon, and basically you just -- you make an account, you click in. "This interests me. Cars are interesting to me. Baseball is interesting to me. Technology is interesting to me." And you can click this little button, and it'll randomly direct you to a website based under one of these categories... And, if you're with a friend who likes some of the same things you do, you click on that button. You're both reading along, and you're entertained, you know.

Lisa and her friends also turned to ICTs when they were together: "Sometimes we watch TV... Or, we'll get together and watch a movie. Or, my friend in ...another dorm, she has cable, too, so I'll go over there and she usually has TV on. Or, like, we'll listen to music or, or just have music on, or something like that."

Some students reported using ICTs less or differently in college due to the social environment that they encountered. Before coming to college, Michael knew, "When I get a computer and I'm in my room, and I get an Xbox and I'm in my room, I'm just in my room all the time." This affected his personal relationships, as he said, "probably for worse." Once he started college, Michael discovered that his old social habits did not apply anymore: "Things change when you go to college. Like at home I was just secluded, a lot... Because I had everything I needed in my room... But here, there's a lot, I mean, I do what I need to do and then I usually go to my friends downstairs." Sometimes, an ICT just never became a part of the friendship. Although she had been in college for a couple of months, Samantha had not exchanged phone numbers with any of her new friends because, as she said, "mostly I see them at dinner every day, because we all eat dinner at the same time, and then we hang out in the lobby and see them." Brittany and her friends in college bypassed communicating via Facebook, a medium she used a lot in high school, because as she said, "a lot of my friends are in the same dorm or...they

just live in like [a dorm] or something that's super close so they can just like come over really quick.” Trying to contact friends on Facebook became more cumbersome than meeting in person.

Some students placed a higher value on being with friends in person than on using ICTs. Craig, a nontraditional student going to school in his hometown, strongly preferred socializing with his friends in person:

I like to drive over to your house and see your face... If I haven't seen my friend for a while or my group of friends for a while, like if I'm studying and for like a week or two and I don't get talk to them or see them, I'll go make rounds. I'll--I'll go physically see you for about 10 minutes and then I'll go over here and see Bill, and I'll give over here and see Mark and then I'll come over here. I mean, yeah, I could pick up the phone and talk to you, too, but I believe in the interpersonal talking.

While Brittany and her friends certainly used ICTs, they tried to create an environment where hanging out in person was more important than playing with an ICT:

I mean, other people have more like high tech stuff, so they're always, you know, on their phones, texting, playing a game. And like, whatever, that's fine because that's you know, what we all do ... But, a lot, me and a couple other of my friends, we kind of get tired of it. Like everybody always being on their laptop or their cell phone. Especially when we are having dinner or at the movies or we're trying to hangout as a group. And then they're sitting there on their phone. We're like, “Just put it away. Just leave it alone for like five minutes.”

Students used ICTs in ways that made them feel comfortable with their friends. Most students indicated that their friends used ICTs the same way that they did, as Ellen found. Ellen tended to avoid ICTs when she could, so she was pleased in college to discover: “You don't have to depend upon it, which I really, I like that... Most of the people that I talk to... they have similar uses of technology as I do.” Abby, felt like she fit in “when people like mention you on Twitter, you're like, ‘Oh, I have friends. Like it just makes me feel special.’”

Other students did not believe that ICTs affected how well they felt like they fit in at college. Erica noted that the “in-person interaction” had more to do with her feelings of fitting in for a fairly prosaic reason, because as she said, “for it to be really technological, you have to

know them and know their name to, like, have them as a friend on Facebook or, you know, phone number or things like that.” Jacob explained that, for him, “the main thing is just like the attitudes of people around here. And, I mean, that really doesn't have anything to do with technology, just people are really nice here. So, that's, that's probably the main reason why I fit in so well.” Michael laughed when he explained that ICTs did not affect whether he felt he fit in with friends: “You don't need a computer to be social.”

Even when students did not feel like they fit in, or did not completely fit in, they did not believe that ICTs affected that feeling. Bethany revealed:

I really wanted to be in a sorority, kind of... But, like by the time I decided to come to [Keyboard] State like it was way too late to like figure anything out. So, I was like, "Okay. I'll come to [Keyboard] State and I'll make friends by myself it's fine."...But then, like I tried to make-- I made friends. But they're not like...good friends...I feel like I don't fit in because I don't have really good friends. So, now I'm joining a sorority.

However, Bethany said that that she did not believe that ICTs played a role in how she felt about fitting in. Craig, who felt that he fit in with, “I say 60-40 split, the 60 part being for the better,” believed, “I think it's an age thing to be honest...I mean, 19-year-olds or 18-year-olds don't want to hangout with a 40-year-olds or 50-year-olds.”

Students used ICTs in their friendships however they wanted. The ICTs, the manner in which they were used, and the degree to which they were used varied between social groups, with each group of friends establishing their own norms. While ICTs could help students feel like they fit in at college, other students indicated that the in-person relationships played a much stronger role in their feelings of fitting in or not fitting in.

Cell Phone Mores

“Oh man, kids are glued to their smartphones anymore aren't they?” commented Craig, a nontraditional student. When I was interviewing traditional-aged students, the subject of smartphones or, more generally, cell phones repeatedly arose as the students described rites of passages and a hierarchy of cell phones that impacted their relationships with peers. Almost every student interviewed remembered when they got a cell phone, what that cell phone could or could not do, and how their cell phone compared to those of their peers. While this study can

only begin to touch on the cell phone culture of traditional-aged college students, the following overview provides an initial insight into the role cell phones play in their culture.

My First Cell Phone

Students reported that the median age for their peer group to get a first cell phone was during the middle school years, roughly between 7th grade and high school. Students referenced when they got their cell phone by their relative age. Bethany recalled, “I was the first one. And I was like super young, apparently. I got my first one when I was 9.” Abby was in fifth grade when, among her groups of friends, she became “the first one to have a cell phone, so that they always like wanted to play my cell phone and stuff.” Students who got their cell phones early did so primarily so that their parents could keep in contact with them. In Bethany’s case, her parents were divorced. She said, “I went back and forth a lot. So, just to make sure I could like stay in touch with my other parent when I was like at the other one's house.”

Brandon remembered that his friends and classmates got their first cell phones “probably between eighth grade and freshman year in high school. It seemed like everybody then... That was the age that you could finally, you were allowed to have and use that technology.” Cody’s first cell phone came “right around that junior high time. I think seventh going into eighth is when I got one. And it was just a... pre-paid phone, but. I don't know, it was cool.”

Jacob believed he got his cell phone later than classmates, “I got mine, well I think I got mine at a late age. I got mine sophomore year. And I've kind of had- I've had to pay for it. ... Which, I thought was awful at the time, being a little dramatic preteen kid, having to pay for his cell phone when everyone else had their Blackberries.” Rachel was another student who got her first cell phone later:

Well, I guess out of our group of friends it could be, like, me and my sister because we didn't have phones until we were 16 and our, all of our other friends had them when they're like in middle school. And so we were probably seen as, like, behind them in the whole technology thing because we didn't have phones.

The cell phone culture existed in for Mingxia in China, too. She recounted that she was one of the late adopters, too, “I can recall my primary school and, um, my mother is strict to me so I don't ... have a cell phone, but my classmates do.”

Texting

If a student's first phone did not have texting, then their next milestone or rite of passage was a texting plan. Some students did not consider their phones "real" until they got texting, preferably with a plan. Yolanda remembered that her friends "all had cell phones. I didn't get a cell phone until I was in high school...And I was so sad." Interestingly, Yolanda did have a cell phone before high school, but it was "a pre-paid one in seventh grade. I didn't get like a plan until like end of freshman year of high school." For Yolanda, getting a plan was the difference between being able to text her friends and not because, as she said, "pre-paid was like call in an emergency. [laughter]. So, if you run out of time, that's it for the month." Brandon got his first cell phone in 5th or 6th grade, "But it was just a little TracFone, I didn't consider it a real phone...I remember being really upset that it couldn't text and that's why I didn't consider it a real phone. It, it was just calling only and I absolutely hated it. [laughter] Considered it an embarrassment." Brandon described when he acquired a real phone: "The end of my eighth-grade year I finally got a little flip phone that could text, call, play music, the whole thing."

Internet Access and Smartphones

A phone with internet access, or a smartphone, emerged as the final milestone for students. Students began upgrading to smartphones sometime after their junior year in high school. Brandee remembered:

I was so excited. Like it wasn't even an iPhone it's, it's a Sprint phone... And I was, "Oh, cool! I actually have things I can do on my phone now instead of just texting people." I think I was the last one in my entire my grade, well, not my entire grade, but -- close, to the last one in my grade to get a smartphone [laughter].

During her senior year in high school, Bethany skipped school to get her smartphone: "I got there at like 10 and then I waited and then I finally got it." Mingxia explained that she got her smartphone a little later than "some classmates, they are richer and they get the technology like iPhone, iPad earlier." Mingxia got her iPhone, as she said, "after I graduated from high school."

Other students did not make the shift to smartphones. Ellen and her younger brother owned similar phones: "We don't have internet access on our phone. So, it's strictly call and texting." For Samantha, "I got a cell phone when I was 16. But it's not -- I never had like a smartphone or anything. It's like a really lame one."

Many students without smartphones still found something appealing about them.

Samantha wanted a smartphone because, as she said,

Well, I mean, they take better pictures than my phone. My phone, the pictures are pretty much pointless. I mean, like, you can take videos and stuff on them, but, like, my iPod can do that stuff, so I -- that's okay to have that. And you can get internet on your phone, but the iPod does that. But I guess a smartphone would just combine all of that.

Ellen, who did not want complicated technology in her life confessed, “There are times I wish I had other, like I could access something on my phone whether it was like a MapQuest or -- just because a phone's always with you.”

Part of the Club

When students had cell phones that did not have the features that their friends' phones did, they felt out of the loop, or that it was not as easy to connect with friends. When they hit a milestone upgraded their phones to be more similar to their friends, they typically reported feeling more a part of their social circle. Jacob, who did not get his cell phone until his sophomore year remembered:

It was kind of tough freshman year. That's probably when it was the hardest like not having one -- I didn't care in seventh or eighth grade really that much because there's nothing really to talk about, but freshman year, trying to coordinate plans and figure out who was doing what, that was a lot more difficult without a cell phone.

Ellen, remembered that, before high school, her friends were already “all texting and communicating that way which...allowed for easier -- to hang out with friends because it was just a ‘What are you doing?’ And then you can organize it better.” When she got her cell phone at 14, she was excited because she had, “Something to carry with me, you know, a way to talk to people, and so that's--I called my friends if I wanted to talk to them.” A year later, when she could text, she “felt more like everyone else.” Between the cell phone and texting, Ellen noticed a change in her social life with friends because, “It gave them a way to reach me, which was nice. And then, I could do more things because there's a way to contact me.” When Brittany got her cell phone in high school, she realized, “I'm just a lot more social... because I'm able to like

text people and be like, 'Hey do you want to hang out?' Instead of like, you know, having to figure it out while we're hanging out what we're going to do next time. I can just, it can just be random and whenever."

Catching up with friends could become a rite of passage by itself when students felt like they were, "part of the club." Lisa recounted that when she got her smartphone in May, before starting college, she felt

included because I have an iPhone and stuff. Before I kind of felt, cause I didn't have Internet on my phone and so I ...couldn't get picture mail or anything. And, I mean, that's not that big of a deal but, people would, like have access at their fingertips and I wouldn't. So, it wasn't that big of a deal. So, in a way, I was kind of behind-ish. And then, when I got an iPhone I was like "part of the club"
[laughter] 'cause everyone has an iPhone.

Some students believed their friends were more affected when the student achieved a rite of passage than was the student. Rachel did not feel too out of the loop: "I didn't have a problem with it. I just kind of thought we were behind everyone because ... they would text people but we would call them on our home phone and it would be, we could still have conversations. It's not like we were any different." But, she thought her friends appreciated it when she got her first cell phone at 16: "I know that our friends thought it was nice because we would always like call them on our home phone and talk to them on there. But they always liked to text everyone else. So I think they were glad that they could text us."

The difference in cell phones continued to be highlighted when students arrived at college. Daniel was highly aware of the disparity between his phone and his peers' phones:

People in general pull out their phones and so on, they usually don't pull out that. [Pulls out his cell phone.] They usually pull out something that's usually a bit more ah, iPod or iPhone or Android or you know things with Internet whereas my phone is not. It's a phone. Texts and calls.

Yolanda noticed the difference on campus, too "only because like everyone has like, you know, a brand new iPhone. Or a G-something-five. Or all that, and you know, I have a little Rumor [laughter]."

Texting vs. Calling

Students developed habits, or followed trends in their social group, when deciding whether to text someone or speak to them on their phones. Cody, when asked how his friends communicated, answered, “I’d say text. I’d, I would rather talk on the phone. I think it gets to the point a lot quicker. But, seems like everyone else just likes to text and I don’t know. I get annoyed with it.” Yolanda was torn between texting and calling: “I would talk, but everybody likes to text. So, [laughter] so they ignore me and then they text me. I’m like, okay, what was the use of that?” But, “I just text back, because sometimes I don’t feel like talking. Just depends on my needs.”

Rachel initially did not understand the appeal of texting,

I remember when our oldest brother got his phone, I was asking him, “Why are you texting all your friends? It’s much faster to just call them and get an immediate response.” Yet, when I got a phone I would just text people because it’s just a casual thing, it’s not like a conversation where I need to know something.

She described texting someone as “just kind of a part of life that is, it’s like less impulsive than a normal phone call. It’s just like a casual conversation that happens over a long period of time.”

Sometimes students used texting as a way to avoid social awkwardness or shyness.

Bethany explained:

If we’re not like together, then probably texting just because with phone calls, there’s always that like awkward--like there’s awkward pauses in conversation and you’re just like, “Mmm.” But with texting, you don’t really have that, so probably, like texting.

Lisa who preferred texting realized, as she said, “It makes me more shy, I want to say, now. I have like more confidence at texting someone something than saying it in person... Before I’d have to say it in person. And now I can just get away with it by texting it or whatever.”

Recognizing, this Lisa focused on not texting as much and instead tried to “be more social, like talking to people, and calling people and stuff, instead. Cause, it kind of takes away the personal, like, personal connection and stuff with people.”

Students identified times when calling took precedence over texting. Michael noted that his habit, when wanting to communicate with someone, was to “probably text them, unless I need to, need to talk to them right then, and then I’ll just call.” Erica found that calling came in

handy if, as she said, “I actually have something to tell them or, like, something to figure out, you know, like, ‘Okay, when are we meeting? What time are we meeting? Where are we meeting?’ I would much rather call them.” Meanwhile, Christine definitely preferred talking to people, “And, like texting, I do it like, you know. Like, I’ll text my friends and stuff and have conversations. But, it just doesn’t -- it’s not that exciting for me or whatever.”

Attitudes About Cell Phones

While traditional-aged students progressed through the various rites of passage with cell phones, their attitudes about the roles cell phones played in their lives and others were disparate. Many students, like Rachel, considered a cell phone a *de facto* part of life, so she expected that, among her friends, “most of them have their own laptops now, so I just expect them to be using social media like most teenagers and cell phones. I expect them to text me back whenever I text them.” For some students, though, a cell phone held a bigger role. Yolanda’s cell phone was the ICT with the greatest impact on her life because, as she stated, “It’s like everything... I put dates in it to schedule stuff. I call people about information. I have access to the Internet, to Google, things that I need. It’s just like everything is there. Except for music.”

Ellen, on the other hand worried that technology got in the way of social development, particularly when she observed the behavior of the children that she babysat:

I feel like it -- it’s not good to be that attached to technology. Because a lot of times, you see kids that are really attached to technology, aren’t -- they might not be as social or as well-rounded. And that, that could be stereotypical. But, at such a young age, I don’t know if it’s good that they’re already wanting phones and if you go straight to texting, you don’t learn to talk on a phone, like a lot of people are uncomfortable talking on a phone. And I think part of that’s because they don’t have to. And then you lose the face-to-face contact and value too. Like I’d rather talk to my friend face to face than through texting or on the phone.

Ellen commented that, “Some people say they can’t live without their phone. It’s like, ‘Well, I’d be fine without one.’ It just makes things more convenient.”

When students brought their cell phones to campus, they also brought a set of mores that informed how they interacted with their peers. Students who were not part of this particular culture, or who lived on the edge of it, like nontraditional students, were impacted by it when

they encountered the implicit expectations of their peers. For instance, Craig found his younger classmates questioning, “Why do I have an ancient phone?” And when he tried to get directions: “‘Just type it in to your GPS.’ And it's like, ‘I don't have GPS.’ ‘Type it in your smartphone.’ ‘I don't have a smartphone. Just give me directions.’ So he was laughing at me about that.”

Students also brought these mores into the classroom in unexpected ways, as discussed earlier in regards to the texted papers.

Students employed ICTs to help them find and create social environments that were “congenial to their preferences.” Due to the nature of ICTs, students were able to create environments that retained some aspects of their social environments from home, if they wanted. Some students found that the ICTs helped them over social hurdles like meeting new people or figuring out how to hang out with new people without feeling weird or like an outsider. When students established their social circles, they used ICTs as much or as little as they wanted, in accordance with their preferences. While students found the ICTs to be useful socially, many students also found that their in-person interactions were more valuable in relation to their feelings of fitting in.

Retention

The research question for this study was partially framed within the context of student retention. Students were asked if they were to consider leaving the university before graduating, would ICTS play a role in that decision. Most students were taken aback by the thought of leaving the university like Daniel, “I've never really thought about leaving K-State.” Many students had a difficult time formulating a reason why they would leave the university before graduating. Three students could foresee leaving the university. Lisa, as a Pre-Nursing major, noted, “Well, actually, I am going to leave [Keyboard] State. [laughing] I have to.” Jacob was in the midst of decisions about his major, so he could envision leaving the university for two reasons, “Cost. [laughter] That's probably the main big thing. Whether another college has a major that I'm looking for that, that isn't here.” Erica, drove home most weekends and said that family would be an issue, “I think if I were to leave, the only thing that may play into it would be, you know, if anything happened with family, be going closer to the family... So that's the only reason I could see leaving, but I really do love it here.”

Students overwhelmingly responded that they could not see a way that ICTs would have a major role in a decision to leave the university. Ellen was an exception. She postulated, “I think like if I wasn't able to do effective homework or research, like if the library didn't have the resources I needed or I wasn't able to accomplish things because of the technology, that would affect why I would leave.” But she clarified, “I don't foresee that happening as of right now.”

Some students could identify ways in which ICTs at the university helped them with the transition to college. Brandee described a conversation with someone who was considering transferring to the university:

I said, “[Keyboard] State you may be one in twenty-four thousand but they make sure that you are a *one* in twenty-four thousand. It's not like you're just a face in the crowd.” And I think that, with the website, and with the KSOL, and with the Facebook group it can really help make you not feel so washed out, out of everyone. So it's kind of more of a, they care, they actually, people actually do care about you here.

Rachel felt that the university's technology helped new students entering the university:

The technology with just university's website and everything I think helps transition first year students pretty well. And I think if you were just considering going here you could see all the course offerings and see if it's the right school for you. You know being able to look at a map immediately is very helpful or maybe seeing if there is a textbook online. I think it does help transition a lot.

Additionally, Rachel remembered, “I think the website helped a lot when I got here because you can find out any events that are happening at the Union...if they didn't have that, you could have fliers and posters, but it wouldn't be as easy as it is.”

Essentially, leaving the university was not something on the minds of most students. Therefore, formulating a situation when ICTs would play a role in that decision was something they could barely fathom. Some students were able to articulate the ways in which university ICTs helped them with their transition to college.

Summary

Based upon the findings of this study, students experienced ICTs in higher education as: a process of academic integration, situations for which they held internal or external loci of

control when using them for academic purposes, and tools to use when becoming socially integrated into the university.

When students entered college, they began learning the how they were expected to use ICTs for their classes and figuring out how they could use them socially with their friends and classmates. Students relied on their instructors to advise them on the rules for using ICTs in their classes. Students typically preferred it when their instructors took the time to clearly describe what ICTs they would use, how to find them, and how to use them. With this information, students were more comfortable and confident when they had to use the ICTs. If students already knew how to use an ICT because it was familiar or they had learned about it before the instructor mentioned it, they also felt comfortable when they learned they were expected to use it for class. Students were frustrated and confused when they could not understand what ICTs their instructors expected them to use, where to find them, or how to use them. Students felt anxiety if they felt like they had to guess what the rules were about using ICTs in the classes or if they discovered that their instructors or classmates assumed that they could use an ICT and they could not. Students were confused when their instructors did not follow the rules about using ICTs that the students were expected to follow, or if an instructor did not use an ICT the way students had been taught that their instructors would.

When students used ICTs in college for their classes or coursework, sometimes they felt like it was out of their control and sometimes they felt like they were in control. They could feel like it was out of their control because their instructor decided everything about what ICTs were used in class or with the homework. Students sometimes felt that there was nothing they could do if an ICT did not work properly or broke. Sometimes students were happy that their instructors made rules about using ICTs because they wanted someone else to make sure that they made good decisions about studying or going to class. Other times, students were frustrated because they felt like the rules or the ways the ICTs worked got in the way of how they wanted to learn. Students felt like they were in control when they could make their own decisions, such as about whether or not to use an ICT or if they needed to attend class. If a student felt like they understood how to use an ICT for classes, they felt like they were in control. They also felt like they had some control if they figured out how to use an ICT to help them understand class materials better or came up with an idea for how to study or prepare for classes on their own. Finally, when students did figure out how to fix a broken ICT or how to work around it, they felt

like they were in control, even if they were stressed and unhappy while trying to fix things. When students felt like they could make decisions about what ICTs to use and how they would use them, they felt like they could be more responsible for their learning in ways that they felt helped them to learn better.

Compared to using ICTs for classes, students had much greater control about what ICTs they used with their friends and classmates. Students used ICTs to remain as connected as they wanted to with family and friends from home. The closer they were to someone, the more they liked ICTs that helped them feel like they were with that person. Students used ICTs to find friends and become part of social groups. They found that ICTs were helpful if they wanted to meet new people, but found it awkward to start conversations, did not know what events were happening, or how they could meet up with new people. When students were with their friends in college, they developed their own habits about how their friends would communicate, share jokes, or make plans. Depending on their group of friends, students used ICTs a lot or not much at all. While students found the ICTs to be useful socially, many students also found that it was how they felt when they spent time with people, in person, that made them feel like they did or did not fit in.

Chapter 5 - Discussion and Implications

This chapter provides a discussion of the findings of the current study in relation to the current literature on how college students experience ICTs in higher education. Following that, a new literacies hybrid perspective for academic use of ICTs in higher education is proposed. This chapter also addresses the implications for future research. The chapter concludes with recommendations for faculty, instructors, student affairs professionals and other staff regarding how college students experience ICTs in higher education.

Discussion of Findings

Based upon the findings of this study, and in response to the overarching research question that guided it, students experienced ICTs in higher education as a process of academic integration, situations for which they held internal or external loci of control when using them for academic purposes, and tools to use when becoming socially integrated into the university. Students experienced varying degrees of comfort and confidence with the ICTs they used for academic purposes. Students expressed frustration if they did not understand an instructor's expectations, when ICTs did not work, or if they felt like the ICTs got in the way of their learning. Students did feel comfortable or confident using ICTs if they understand how and why they would use them, if the ICTs worked as they were supposed to, and when they figured out how to use ICTs in ways that helped them learn better. Students used a variety of ICTs when they were maintaining friendships they had before college or when they were making new friends in college. Students typically used familiar ICTs to help them meet new people or within their new circle of friends at college, although they sometimes learned new ICTs if they wanted to remain close with good friends. While ICTs could be helpful for students socially, they found that their in-person interactions with their friends and peers in college were much more valuable to them than when they connected through ICTs.

Academic Integration

This study suggests that students experience ICTs as a process of academic integration during which they negotiate their instructor's explicit expectations of ICT use for their coursework, the implicit expectations of their instructors and peers of ICT use, and expectation dissonance when their expectations of ICT use did not match those of their instructors. These

expectations are part of the university's cultural norms, the "widely accepted ways of doing things which shape how people think and behave" (Kuh & Love, 2000, p. 198). Understanding and enacting these expectations help students become academically integrated or "congruent with the academic communities of a college or university" (Braxton, Brier, & Steele, 2007, p. 380).

The students in this study tried to identify the cultural norms regarding their use of ICTs for academic purposes so that they could understand what it means to be a college student. Collier and Morgan (2008), in a recent study, investigated the "implicit expectations" and "tacit understandings" of faculty and first-year students regarding the "college student role" (p. 426). They found that:

Students' success in college depends not only upon their explicit understanding of course content but also their implicit understanding of how to demonstrate that knowledge in ways that will satisfy each professor's expectations. Hence, even when two students have an equivalent mastery of the explicit content of their course work, the one who has a better understanding of the professors' implicit expectations will be more likely to succeed. (Collier & Morgan, 2008, p. 428)

While Collier and Morgan's research indicated that traditional students were more likely than first-generation students to grasp implicit knowledge, this study indicates that many of the students in this study, traditional and non-traditional, searched for clues to understand the cultural norms regarding student ICT use in higher education.

Students who felt that they clearly understood what their instructors expected expressed more confidence in their ICT use. The earlier that students could grasp expectations, the more confident they felt going forward. Kuh (2001/2002) noted,

For decades institutions...expected newcomers to discover on their own the institution's values and what they needed to do to survive and thrive. Implied in this view was that: 1) students want the same things from college as do the faculty; and 2) students would act accordingly (p. 29).

However, since students do not always either want the same things as faculty or understand what faculty expect of them, "we can no longer afford to leave serendipity to chance and must become more intentional in all that we do to promote student success, especially in the early

weeks of college” (Kuh, 2001/2002, p. 30). Thus, when instructors consciously make tacit expectations explicit early in the semester, they can remove unintended impediments to student academic integration.

When the students in this study did not receive guidance or feedback on their use of ICTs, they felt lost or confused. The students also expressed more confidence in their learning when they could monitor their own progress through ICTs like the course management system or using clickers in class. This finding is consistent with research indicating that new students need feedback and validation in order to more accurately understand and achieve their academic goals (Gore, 2006; Rendón et al., 2000). When establishing best practices for undergraduate education, Chickering and Gamson (1987) included prompt feedback as one of their seven principles, suggesting that “Knowing what you know and don’t know focuses learning. Students need appropriate feedback on performance to benefit from courses” (p. 3).

Within the new literacies concept, the “college student role” that Collier and Morgan (2008) reference constitutes a Discourse in that it is a

socially recognized [way] of using language (reading, writing, speaking, listening), gestures and other semiotics (images, sounds, graphics, signs, codes), as well as ways of thinking, believing, feeling, valuing, acting/doing and interacting in relation to people and things, such that we can be identified and recognized as being a member of a socially meaningful group, or as playing a socially meaningful role. (Lankshear & Knobel, 2007, p. 3)

When the first-year students in this study encountered the expectations of their instructors and peers, they were learning about the Discourse of being a “college student” at this university. That Discourse included socially recognized ways that college students were expected to use ICTs. If students are to succeed and become academically integrated, then they need to become members the Discourse. According to Gee (2012), there are two ways to gain an understanding of a Discourse:

Acquisition is a process of acquiring something (usually subconsciously) by exposure to models, a process of trial and error, and practice within social groups, without formal teaching... Learning is a process that involves conscious knowledge gained through teaching or through certain life experiences that trigger conscious reflection. (p. 167)

Gee further explains that the only way someone can become a member of a Discourse is through mastering it, and that only occurs through the acquisition process. This indicates that, while students may express initial confidence when using an ICT if their instructor has been explicit in his or her expectations of its use, students will not master it unless that ICT becomes a supported part of their academic practice and unless they observe its use effectively modeled by their instructors and peers. This has interesting ramifications in instances such as composing emails when students understand the expectation to be professional, but they either receive no affirmation that they are professional or the emails that instructors compose do not model professionalism.

Even when instructors believe they are explicit in their expectations, “students, in general, often had difficulty interpreting those expectations” (Collier & Morgan, 2008, p. 436). This may be heightened when students come from cultures, or Discourses, that have little in common with the Discourse of being a university student. When students have a greater gap between their home culture or Discourse and the university’s Discourse, such as first-generation students or students from historically-underrepresented cultures, they may find themselves struggling to make sense of concepts or practices that their fellow students, who perhaps had parents or siblings attend college, adopt more readily (Collier & Morgan, 2008; Gee, 2012; Kuh & Love, 2000). Students who are less familiar or comfortable with ICTs, may also feel like they are “at an academic and social disadvantage in comparison with more insider peers” (Wilber, 2008, p. 573). This suggests that university instructors and other professional staff need more information about what students understand upon entering college so that expectations can be expressed more meaningfully to all students.

Students in this study expressed frustration or confusion when their expectations did not match their experiences in college, such as when they encountered unanticipated modes of using ICTs for courses like as a flipped classroom or online homework. While this study did not identify any ICT uses that students express as being tremendous barriers, it is worth noting that when there is enough incongruence, or dissonance, between students’ cultural norms and expectations of college and their experiences, a student may feel that she or he is not becoming academically integrated into the institution. Braxton and Lien (2000) suggested, “Academic normative incongruence may occur around students’ incompatibility with the prevailing

academic attitudes, values, and beliefs at various levels of the academic system” (p. 24). Kuh (2001/2002) explained that this can lead to student departure:

Students either reject the institution’s attempt to socialize them, or they have not found a cultural enclave from which they can draw support and guidance as they try to negotiate what seems to be an “alien culture.” (p. 28)

Students encountered the use of ICTs as social norms that they were expected to understand and adopt in order to become academically integrated into the university, or identifiable as being in the “college student role.” University faculty and other professional staff may be unaware of how different the university culture is from the students’ home cultures and thus not understand how explicit their expectations need to be in order for students to grasp them. Students are more likely to adopt ICT norms when they are supported and modeled by their instructors and peers. The students in this study did not experience enough stress or dissonance with learning the ICT norms to consider them a reason for leaving the university.

Locus of Control

Students in this study interacted with ICTs for academic purposes with either an internal locus of control or external locus of control. According to Smith and Mihan (2009):

Locus of control is considered the belief in one’s ability to influence life events. Someone who accepts both positive and negative outcomes and consequences as the result of their own behaviour is considered “internal” whereas someone who considers others to have influence over both positive (luck) and negative (other’s fault) results is considered “external.” (p. 63)

This study relies upon how students described their actions and thoughts to indicate an internal and external locus of control for specific situations. For instance, when Daniel was having problems with a homework assignment, he talked about the steps he took to complete a problem, but, “the thing won't accept it and you won't know why.” He understood his actions, but had no control over completing his homework because of how the system operated. Assumptions cannot be made about a student’s overall locus of control based upon a specific situation. Additionally, a student’s locus of control in certain situations may not have been purely internal or external, because, “locus of control is not a dichotomous internal or external characteristic but, rather, a construct along a continuum” (Hoover, 2003, p. 106). With these caveats, the concept of locus of

control remains the best way to describe whether students perceived whether it was their decision to use an ICT or whether their behavior affected an outcome when using an ICT.

Due to the nature of university classes, students may perceive that their locus of control for coursework is external, directed by their instructors or even the ICTs, such as the online homework or internet connections. However, instructors can integrate ICTs into their courses so that, pedagogically, students may engage with the ICTs and their learning from an internal locus of control. Students in this study also exhibited the ability to engage with ICTs from an internal locus of control outside the classroom when they created their own methods for learning or when they resolved issues with their personal ICTs. When students use ICTs to tackle learning on their own, they are “creating a digital and participatory culture independent of the structure provided to them” (Kumar, Liu, & Black, 2012, p. 225).

Understanding how students perceive their control over an ICT may inform discussions of academic self-efficacy, when students who are self-efficacious about college “believe in their ability to survive and adapt in an academic environment” (Bean, 2005, p. 220). Hoover (2003) tied a person’s locus of control to self-efficacy: “If individuals infer efficacy belief from imagined outcomes, the belief that personal actions or external forces determine these outcomes may affect behavior contributing to achievement” (p. 106). Due to the fact that so many students encounter their course content bound in ICTs, students’ ability, or inability, to negotiate ICTs may become confounded with their academic self-efficacy. For instance, a student who cannot learn the rules for entering a mathematical answer in an online homework system may believe that she or he cannot do the math, when in fact, it is the procedures of the homework system that she or he cannot negotiate. This study also raises the concern that students operating with an internal locus of control may be willing to make poor decisions that can affect their academic standing, as well, suggesting that internal locus of control and academic self-efficacy are not always directly related.

This study found that some students would prefer that faculty direct their learning and use of ICTs in college. However, “students with an external locus of control are considered to be at higher risk of non-persistence” (C. A. Smith & Mihans II, 2009, p. 63), while students with an internal locus of control exhibit, “greater independence and self-direction, more accurate self-monitoring and evaluation, and more rapid assimilation related to learning” (Hoover, 2003, p. 106). Faculty are encouraged to create opportunities for student to assume an internal locus of

control when learning, either in the classroom or outside it. This can help students develop an internal locus of control even if they did not enter college with one. Fazey and Fazey (2001) suggested, “High-quality teaching, that focuses on developing student autonomy in learning, will offer opportunities for the development of all individuals, including those who might be at risk” (p. 356).

Students with an internal locus of control believe that their actions can affect outcomes when they are using ICTs. This internal locus of control can help them when they need to troubleshoot ICTs or identify effective ways of learning for themselves. Students with an external locus of control when using ICTs in college may feel that they have less of a role in their own learning.

Social Integration

Students in this study employed ICTs to help them find and create social environments that were “congenial to his or her preferences” (Kuh et al., 2006, p. 11). Due to the nature of ICTs, students were able to create environments that retained some aspects of their social environments from home, if they wanted. Some students found that the ICTs helped them over social hurdles like meeting new people or figuring out how to hang out with new people without feeling weird or like an outsider. When students established their social circles, they used ICTs as much or as little as they wanted, in accordance with their preferences. While students found the ICTs to be useful socially, many students also found that their in-person interactions were more valuable in relation to their feelings of fitting in.

When a student leaves home for college, he or she may feel “lonely and homesick...In this early stage, before students establish new friendships, emotional support from family and friends at home can act as a buffer against the stress of feeling alone in a strange environment” (Wilcox, Winn, & Fyvie-Gauld, 2005, p. 713). While none of the students in the study expressed homesickness, many of them did describe the ways that they stayed in touch with friends and family. Some students were satisfied with easing away from friends and high school acquaintances, simply monitoring their old friends through social media like Facebook. Other students retained more active connections, texting, calling, or video-chatting, depending upon the level of friendship and content of the message. It is worth noting that, while most students indicated they did not have the time or inclination to learn a new ICT as first-year college

students, several learned to use some kind of video-chat program so that they could see their close, but dispersed, friends. Even when they experienced technical problems, students valued the video-chatting because it came closest to simulating being with their group of friends in person.

Tinto (1993) posited that: “Students who retained their high school friends, especially those living off campus, tended to have the greatest difficulty in becoming socially integrated” (p. 62). His claim has been disputed over the years, particularly for students from cultures with strong family and cultural ties (Rendón et al., 2000). None of the students in this study who described staying in close contact with their family and friends from home via Skype, Facebook, or other ICTs indicated that they had unusual difficulty making friends in college. The one student who suggested that family concerns might be an issue that would cause her to leave the university also indicated that it was the time and cost of driving home that was the concern, not time spent communicating with the family online. The experiences of the students in this study, then, support research that students who want it, benefit from the option of maintaining close connections to family and friends through ICTs (Abeele & Roe, 2011; Duggan, 2004; Ellison, Steinfield, & Lampe, 2007; Wilcox et al., 2005).

Although students could retain their connections with friends from home, many of them spoke of their efforts to make new friends. Known as the transitional phase (Tinto, 1993), students at the start of the semester

have an urgent need to belong, to identify with others, to find a safe place, and to negotiate their new identities as university students, and friendship is about having friendly faces around and making initial contacts which may or may not develop into friendships. (Wilcox et al., 2005, p. 713)

When making new friends in college, something that could be awkward, students turned to familiar, comfortable ICTs, like Facebook. While fewer students were active on Facebook, they did “friend” classmates and acquaintances so that they could learn more about them on Facebook, “information that could potentially help students establish common ground with one another and serve as a social lubricant” (Gray, Vitak, Easton, & Ellison, 2013, p. 10) While students looked to their instructors to understand the academic norms, older students could offer insight into the social Discourses of campus by distributing information via a Facebook page or advising students of Twitter hashtags for relevant social groups.

Most students described their circle of friends using ICTs in similar manners, suggesting that they were forming their own Discourses. Kuh and Love (2000) indicated that social integration does not require that students become integrated with the entire institution but that they feel a level of

social and psychological comfort with their colleges' milieus, association with or acceptance by affinity groups, and sense of belonging that provides the security needed to join with others in common causes, whether intellectual or social. (p. 197)

Several students mentioned using social ICTs, like Twitter, to communicate in-jokes or acknowledging friendships. Such behavior is a social cue that they feel like they belong: "A particular text that someone produces might well be best understood as an expression of wanting to feel "connected" or "related" right now" (Lankshear & Knobel, 2007, pp. 4-5).

The traditional-age students referenced cell phones as a core ICT among their group of friends, which, given the manner in which cell phones were integrated in their lives prior to college is unsurprising. Considering that traditional age students tend to be the dominant age group on campus, it is possible that the mores related to cell phones that they brought with them, may change the social environment of the university both for those within their Discourses or social groups, and those marginally associated with them. Tinto (1993) noted: "We must recognize that the process of integration in college is an interactive one in which individuals also act to reshape their environment" (p. 106). Kuh and Love (2000) agreed that "culture is constantly evolving...shaped by interactions between old and new members" (p. 198). If we consider new literacies, "There is one important way in which Discourses change—people mix them and their mixtures get recognized and accepted" (Gee, 2012, p. 166). New college students have a strong historical record of integrating new ICTs into the college community. While Facebook is certainly one of the most recent (Ellison, Steinfield, & Lampe, 2007; Gray, Vitak, Easton, & Ellison, 2013), email and Instant Messaging are also ICTs that students historically embraced as essential ICTs for communicating with friends (Baym et al., 2004; Quan Haase, 2007).

An interesting theme that emerged from this study was the preferential value that students placed on their in-person interactions with friends over texting or other ICTs. Some students forewent ICTs in favor of in-person contact as a matter of personal preference. Other students

found that the way their friends socialized left little need for them to use ICTs. Even with students who used ICTs with their friends, the emphasis was either on using ICTs to arranging meeting up, or using ICTs while they were hanging out. This inclination is not unique to the students in this study nor with the ICTs that they use, but emerges in other studies of students' social uses of ICTs (Baym et al., 2004). While most students referenced feeling as though they fit in due to their in-person relationships, one student, who used Facebook and other ICTs as icebreakers, indicated that she did not feel like she fit in. However, she also indicated that she did not believe that ICTs contributed to that feeling. Taken together, this may indicate that while ICTs can help people meet people and maintain existing friendships, ICTs are tangential to personal relationships for first-year college students.

Students used ICTs as means to create and maintain friendships in college. Their connections with family and friends from home may help them feel socially connected until they can make friends in college. Students and their friends determined the manner in which they would embrace or disregard ICTs in their relationships. While students used ICTs in a variety of ways, the underlying intent in using them was in support of their in-person relationships.

Retention

When embarking on this study, the problem of student retention was raised as a concern because we do not know enough about how ICTs in higher education correlate to student retention. I hoped, through this study, to learn more about the relationship between first-year students' perceptions of ICTs and retention. However, this study is ultimately unable to address this issue. Few of the students who participated had actively considered leaving the institution. Students also struggled identifying a way that ICTs would impact their decision to stay at or leave the institution. In general, student participants were more focused on becoming academically or socially integrated than on future decisions to leave or to stay at the university. This study, then, lacks data that can provide insight about student perceptions of ICTs and retention. This outcome does not indicate that student perceptions of ICTs do not play a role in retention, merely that the data from this particular study does not answer that question.

A new literacies perspective on ICTs in higher education

Due to the developing nature of the New Literacies theory, researchers and practitioners are calling for insights as to the applicability of the theory in higher education, where ICTs are

embedded socially and academically (Wilber, 2008). Much of the current New Literacies literature explores how technology transforms what it means to be literate (Coiro, Knobel, Lankshear, & Leu, 2008a; Lankshear & Knobel, 2007; Leander & Lewis, 2008; Leu et al., 2013). When beginning this study, I identified three common tenets of new literacies: literacy is a social practice (Gee, 2012; Street, 2008); new literacies are deictic (Leu et al., 2013); and new literacies mobilize new values or ethos in how people practice literacy (Lankshear & Knobel, 2007). With these tenets in mind, this study provides some insight into a New Literacies perspective on ICTs in higher education, focusing on the experiences of first-year students. While the experiences of individual student participants are disparate, and could undoubtedly provide more insight into specific new literacies, this study focuses on the common, shared experiences of first-year students. Each of the tenets is elaborated upon below within the framework of experiences of first-year students.

1. New literacies are a social practice wherein the texts have meaning within the context of a society. When students enter college, they remain members of prior Discourses, such as their family or close friends. As new students, they are becoming members of the “college student” Discourse. Students may become members of other existing Discourses, like fraternities or sports clubs. Socially, they identify and create new social Discourses with their group of friends. The social practices of the Discourses that students encounter shape the students’ new literacies, both academically and socially.

As new members of Discourses, like “college student,” students learn about deciphering texts like a syllabus, grades in a course management system, the online homework system, and class assignments. While someone outside the Discourse could read these texts and make some sense of them, these texts have meaning unique to the members of the Discourse as they are informed by the content of the course, the pedagogy of the course instructor, and even the ICT resources available at the university. As part of becoming academically integrated, students learn from their instructors about the ICTs and relevant new literacies that will serve them throughout college or that are pertinent to a specific course. Some instructors help students learn what it means to write a “professional” email to their instructors so that students can apply that literacy throughout their college careers. Within a specific music class, an instructor uses a YouTube video of a jazz singer because it illustrates a concept about musical time that students cannot grasp from the textbook. Students may discover that the ICTs and new literacies will vary from

class to class; although, they may not always know the reason why. For instance, an instructor may eschew PowerPoint lectures in favor of projecting a series of images with a document camera. This delivery of information is socially constructed because it is based upon the instructor's learning disability and the learning styles of her students. That is, it is the learning and teaching styles of the people in the class that determine what ICTs are used and how. With a different instructor or a different set of students, those ICTs and related new literacies may vary.

As co-creators of new Discourses of a circle of friends, students develop inside jokes and habits that can be informed by shared interests, senses of humor, their cell phones, and the activities that they engage in together. Within these new Discourses, friends decide what ICTs are most useful and what it means to be literate with these ICTs. A group of friends migrates to Twitter from Facebook because they want to share inside jokes, but do not want to read about the drama of people they barely know. This group of friends develops specific hashtags as a way to communicate inside jokes or to alert each other of a new Tweet. Another set of friends may purposely not use ICTs when they are spending time together because they do not want the distractions. As with the classrooms, the ICTs and new literacies associated with them may vary as the social makeup of the group varies. A group of friends who all have smartphones may develop different communication habits than a group of friends in which only some students have smartphones.

Some students find it takes longer or is more difficult to become a member of a Discourse. When students enter college, they are not automatically full members of the "college student" Discourse. They might better be referred to as apprentices as they try to understand what their instructor means when they say that grades are online, or how to write a professional email, or even learn how to study for college finals. Other students experience that finding people with whom they have enough in common to be good friends is more difficult than anticipated. Additionally, membership in a Discourse does not imply that all members will act and respond to situations or literacies in the exact same way every time. Every person is a member of multiple Discourses starting with the primary one in which they were raised, what Gee (2012) refers to as, "a culturally distinctive way of being an 'everyday person,' that is, a non-specialized, non-professional person" (p. 153). A person may acquire additional, or secondary Discourses throughout their lives such as being a "college student." However, Gee (2012) clarifies that "a person's primary Discourse serves as a 'framework' or 'base' for their

acquisition and learning of other Discourses later in life. It also shapes, in part, the form this acquisition and learning will take and the final result” (p. 170). This intricate interlacing of Discourses thus influences how a student may behave or believe, even when all students are “college students,” leading to different fluencies or adoptions of new literacies.

2. *New literacies are deictic* wherein they exist in the particular time and context.

When students enter college, they are expected to use ICTs specific to the university, like the course management system or email, or to their classes, like clickers or online homework. Students enrolled in a chemistry class one semester may complete their homework through the university’s course management system; students in the same class the following semester may complete their homework through the textbook publisher’s website. Socially, students use extant social technologies. Research about how college students use social technologies in just the past ten years highlights a progression of new ICTs as students relied on email (Duggan, 2004), IM (Baym et al. , 2004), and Facebook (Ellison, Steinfield, & Lampe, 2007) and their cell phones to connect with friends.

3. *New literacies mobilize new values or ethos in how people practice literacy.*

When identifying a new value or ethos for new literacies, Lankshear and Knobel (2007) specified that it should be “‘participatory,’ ‘collaborative,’ and ‘distributed’” and “less ‘expert-dominated’ than conventional literacies” (p. 9). Additionally, new literacies should maintain more of an “insider mindset” (Gee, 2007; Lankshear & Knobel, 2007; Leu et al., 2013). Meeting these criteria has been problematic in an academic setting where the instructor has typically determined the content of the course and how it will be taught (Gee, 2007; Leu et al., 2007). This study is inconclusive as to how academically integrated, or how much like “insiders” first-year students feel when using ICTs academically. Clearly, as they begin their semesters, they are still trying to understand the norms and expectations, such as writing a “professional” email. However, while students still experience academic situations when they have little to no control over the ICTs used in a course or how they are used, they also report experiences when they are invited to engage or participate in their learning using ICTs. This can be seen when students use clickers to respond to questions and guide the class discussion. Some instructors, like Professor Darnay, encourage students to bring ICTs in the class and actively search for information online during class in order to help themselves and classmates learn content. This reflects a transition in learning that new literacies enable, one where the instructors are “orchestrating learning

experiences for students” (Leu et al., 2013, p. 1163). Within the classroom or course experience, first-year students currently rely upon the instructor to introduce the new ethos, indicating that they may need to be invited to be insiders.

Socially or for entertainment students interact with ICTs like Facebook, Twitter, Pinterest, StumbleUpon, cell phones, and gaming. Each of these ICTs could be the focus of its own study through the lens of New Literacies. However, popular knowledge indicates that they embody the new ethos. For example, social networks like Facebook and Twitter encourage distributed authorship as anyone with an account can write and share ideas, photos, and videos, which can then be commented upon or shared by others. Communities like Pinterest encourage users to create visual collections of ideas or themes that can be seen by other members of the Pinterest community and commented upon or re-shared, as well. Most first-year students, then, at least access an ICT with the new ethos for personal reasons. What I cannot determine, based upon this study, is the extent to which students felt like “insiders” when using these ICTs. However, this study does indicate that use of social ICTs does not outweigh in-person interactions in regards to how well students felt like they fit in at the university.

The new literacies perspective addresses how students ascribe value to and meaning from the ICTs they use in higher education. Students draw upon the norms of their academic and social Discourses, the ICTs available for that context and time to decide what ICTs to use and in what manner they will use them. While students interact with ICTs embodying the new ethos in their personal lives, their instructors are typically the ones to decide whether or not to integrate the new ethos into students’ academic use of ICTs.

Limitations of the Current Study

While this study ostensibly sought to understand how first-year students experienced ICTs in college, the study’s timeframe limited those experiences to the first semester and did not incorporate the very significant final exam time period. A study that extends through an entire semester or even first year might provide greater insight into students’ mastery of ICTs or issues related to retention that were not raised during this study. Additionally, students self-selected for this study, potentially indicating that these students were engaged in their learning or already engaged in the institution in a way that students who did not participate were not. The experiences of engaged students may not reflect the experiences of all students. This study

included only students who attended courses on campus, so the experiences of students enrolled in online programs are not represented in this study. It is unknown if any of the student participants had physical or invisible disabilities that might affect their interaction with ICTs, although two student participants did reference two invisible disabilities: ADD and OCD, it was unclear as to whether students were using this as a short-hand to describe their behavior or if they experienced the symptoms of these invisible disabilities.

Recommendations for Research

When beginning this study, the research question to understand how first-year students experience ICTs in higher education seemed very straightforward. However, through the course of the interviews with students and faculty, pockets of questions emerged that could not be addressed by a single phenomenology. Little research has been done to fully understand faculty and student expectations for academic integration. Existing research focused on measures such as a GPA, and due to mixed results in the application of these measures, some researchers have questioned whether academic integration has any effect on student success and retention (Braxton & Lien, 2000). Further qualitative studies, such as this one and Collier and Morgan's (2008) investigation into explicit and tacit expectations may provide other measurements or avenues of focus based upon faculty and student perceptions of what qualifies as "academic integration." Also, studying alumni perceptions of academic integration would provide other useful insights.

As was revealed in this study, few of the students had any serious considerations about leaving the university. Students may not have considered leaving the university partly due to the timing of the interview: there might be milestones in terms of grades or anxiety that had not been reached when students were interviewed. In order to understand what impact ICTs make on student retention, we need to interview students who have transferred from the university or made the decision to do so. Having made the decision to leave the university, these students would be better positioned to articulate to what extent ICTs played a role in their departure decisions.

A study that focuses on at-risk students may provide insight into the role that student perceptions of ICTs play in their grades and academic integration. Professor Bhaer's comment in the study that teaching students who are struggling academically to use the course management

system can create a “shocking difference” suggests that ICTs can profoundly affect at-risk students. Therefore, a study of at-risk students could explore why students do or do not use ICTs, if ICT use contributes to poor academic decisions (like skipping class), or if the students perceive the ICTs as a barrier or asset to their learning. This, in turn, could inform our knowledge of students who involuntarily depart our institutions.

The new literacies of cell phones deserves further exploration to answer questions like: What is the Discourse or socially recognizable group? Is age as important as it seems to be in this study? If texting is as shallow as was indicated by the two participants in this study, is that a product of the phone or the reason why texting is used instead of speaking with someone?

One intriguing pocket trend that arose during the study was the effect that siblings have on students’ integration to college, both academically and socially. While not a common, shared experience for all of the students, several students referenced older siblings as real or potential sources of guidance. Another student noted that as the eldest, she shared what she learned with her younger brothers. Yet, a preliminary search of the literature reveals only a few publications about the specific roles siblings play in students’ lives (Ceja, 2006; Jimenez-Silva, Hernandez, Luevanos, Jimenez, & Jimenez, 2009; Yeh, Inose, & Kobori, 2001).

Finally, can an ICT that malfunctions (like the chemistry quiz) shift a student from an internal locus of control to an external locus of control? If so, how long does that persist before it becomes the natural reaction: “It’s an ICT so my knowledge does not matter because I cannot get the ICT to work anyway.”

Recommendations for Practice

University faculty, instructors, and other professional staff can help students become integrated socially and academically into the university’s culture. The following recommendations come from the students or are built upon descriptions of students’ experiences with ICTs in college.

Craig shared advice from one of his first bosses: “Always treat people like they're a moron because they might know but they might not. And if you explain it to them the first time they won't think you're talking down to them later.” Craig explained that it was not so much the idea of treating people like they were stupid, but that they did not have vital, basic information. He went on to say,

I mean, because from my aspect, I would like for someone to explain it to me.... than later on, if they talk down to me while explaining it, it would make me feel worse. Then, I might backslide and think, "Oh, he thinks I'm a moron or he thinks I'm stupid."

For those of us not comfortable with labeling a student a "moron," we can adopt a Universal Design approach to teaching: If you believe that the basic information about an ICT is going to help one or two students function in class, then assume the same information will help all of them. As an addendum to Craig's request, Ellen asked that there be formal introduction to essential ICTS for the university:

I think it'd be nice if there was a way you could be introduced to how some of this works. Because, like I said, I was kind of just thrown into it. And not being overly interested in how things work on the computer, it would've been nice if somebody like ran through like, "This is how you need to get to [Keyboard] State Online. This is what you'll use it for." Rather than just having teachers say, "Go to [Keyboard] State Online and print off the syllabus." So some kind of introduction I think would've been helpful.

All faculty and staff should assume responsibility for introducing students to basic ICTs; we cannot assume that it has been covered by someone else. Students enrolled in academic support or first-year programs may receive guidance negotiating expectations of what it means to be a student. However, other faculty cannot rely on students to receive information in those classes, particularly if the university does not have a first-year program or all first-year students are not enrolled in a first-year course. There is no guarantee that student hear or understand what they are being told the first time, so reinforcement in multiple classes can help establish an ICT's importance and fill in the gaps for the students who missed it the first time for whatever reason. Additionally, students may not have their first class meeting for an academic support class or first-year class until the end of the first week of the semester or even the start of the following week. When some universities start their semesters near holidays like Labor Day or Martin Luther King, Jr., day, then a student in a Monday class will not have that first class meeting until a full week into the semester. By that time, a student could already be behind in another class.

Reconsider placing complete class notes online. Jacob suggested, "Don't put them on K-State Online because then people really won't come to class." Multiple students indicated that the

temptation to skip class was greater when they knew the notes were online. This inclination was compounded when they felt that the instructors added nothing to the notes, leading students to decide not to engage with the courses and to rely just on the notes.

Integrate a texting option into the course management system. Yolanda noted that she received a lot email reminders from her instructors but “I don't check my email when I first get up and all that in the morning. I check it like later, after my classes. And like, a lot of teachers expect you to check it like as soon as you wake up and I don't...So, like I think it would a benefit to just like text.” With the feature integrated into the course management system, faculty will not have to learn to text or enter several hundred contacts in their phones, but students can opt in to receiving announcements and emails as texts, instead. This will permit students who do not have smartphones, but who do receive texts on their cell phones, to stay updated with announcements and acknowledges student ICT norms.

Survey first-year students at the end of their first or at the start of students' second semester, asking them what they wish that they had known when they started their first semester. Use this information to develop materials for orientation, welcome activities, and FAQs. This information can be reused and distributed through multiple social media outlets the following year to help the new class of first-year students.

Teach students to forward their university email to a personal email account during orientation. Many students forget that they may receive important information via email from the university prior to the start of their first semester, and they have not developed the habit of looking at their email. However, they still may periodically check whatever email account that they do have. Provide information about un-forwarding when the semester starts, if university IT policies so require.

Invite faculty and other professional staff to attend a student orientation day so that they can learn what is being shown to students. Encourage communication between the new student services professional staff and the faculty and advisors so that they all understand what students are being shown or not being shown. If in-person meetings are not possible, or faculty cannot attend orientation, share the information with faculty before the semester begins so that the information is fresh and they can incorporate needed explanations into their first days of classes.

Collect frequently asked questions about ICTs that are received at various help desks (library, IT, residence halls), and student offices (Greek Affairs, nontraditional students,

disability support services) throughout the semester. Look for common trends and share these questions with the university campus. This could help faculty become aware of the questions their students have but do not raise in class. It can also help identify trends that would not be identified individually at those locations.

Remind students to bring Ethernet cables to college. While a wireless network is appreciated because students can access online resources untethered from a specific location, they also need to learn to develop back-up plans when the wireless network is stressed. Encouraging students to bring and use Ethernet cables can prompt them to understand that they can look for alternative solutions for their ICT difficulties.

Create ways for students to communicate with family and friends –install a video-chatting program like Skype on laptops for checkout from IT/library/residence halls. If there are organizations for students who have resources such as meeting space or a computer, encourage them to load a video-chatting program on the computer for their members. Encourage parents to bring their laptops or smartphones to IT during orientation to install and learn to use video-chatting software.

Continue to invest time and effort to in-person activities at the start of the semester that help new students meet other students. Encourage the social chair for residence halls, Greek houses, and campus organizations to create outlets for information about these and other events across campus. This helps students who want to meet people but do not know how and are too shy to initiate contact in person to become involved in the campus community.

Summary

The findings of this study indicate that first-year students experience ICTs through processes of academic and social integration, and situations in which they held internal or external loci of control when using the ICTs for academic purposes. Students expressed confidence when using ICTs if they understood what their instructors expected of them or when they felt like they held an internal loci of control when using the ICTs. Students expressed frustration and stress when they did not understand expectations for using the ICTs. Students used ICTs to maintain their pre-college relationships and to find new friendships in college; however, social uses of the ICTs were valued as less important than students' in-person relationships.

The findings of this study contribute to our understanding of new literacies in the context of higher education, as elucidated by Wilber (2008) “Little or no attention is paid to exploring the ways in which digital technologies themselves mediate and shape – or are mediated and shaped by – users’ literacy practices” (p. 567). The findings of this study can also help university faculty, instructors and other staff increase their awareness of how students perceive their experiences with ICTs both academically and socially in college, and use that information to modify how they incorporate ICTs into classes and help students make social connections when they start college.

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Appendix A - Student Participant Profiles

Pseudonym: Abby

Age: 18

Nationality: American

Race: Caucasian

Gender: Female

Major: Elementary Education

Family Circumstances: “Pretty rough lately... there’s three of us in college.”

Proficiency with technology:

Before: I think I do pretty well...I mean, I don't feel like it's changed since I've gotten here, much.

Now: I feel like I'm pretty much the same where I was before I got here.

Pseudonym: Bethany

Age: 18

Nationality: American

Race: African American

Gender: Female

Major: Open Option

Family Circumstances: “Average... Not bad, it’s not good....”

Proficiency with technology:

Before: “I don't know, I was aware of it and I used it but now I think I use it a lot more than I did before.”

Now: “I feel like I know a lot more. Just because like [Keyboard] State Online and like all the stuff that everyone else has used I know how to use now. So, it's like I feel like I know what I'm doing.”

Pseudonym: Brandee

Age: 19

Nationality: American

Race: Caucasian

Gender: Female

Major: Open Option

Family Circumstances: “My family's not well-off...it's getting better but we're not better, yet. So it's, it's a transition at the moment. I'm paying for everything here, if that says anything.”

Proficiency with technology:

Before college: “I know my way around a laptop. Maybe not the most updated version but I know my way around a laptop, I know the basics. I know, you know, Firefox, I know Google Chrome, I know Word. Really into Word because of what I've had to do...I'm not like, uh, how do I want to say this? I'm not a techno-nerd? But, I know how to do things on Internet and phones and stuff.”

Now: “Better.”

Pseudonym: Brandon

Age: 19

Nationality: American

Race: Caucasian/White

Gender: Male

Major: Business Administration

Family Circumstances: “Pretty well off”

Proficiency with technology:

Before college: “Pretty well. Any simple task and even some of the harder things I can usually figure out in, you know, a couple of minutes...”

Now: “I mean, it's been about the same since I started. I guess I use it a little bit more often just because I have a need for it now. But otherwise it's been about the same.”

Pseudonym: Brittany

Age: 18

Nationality: American

Race: Caucasian/White

Gender: Female

Major: Biology

Family Circumstances: "I think we're pretty average."

Proficiency with technology:

Before college: "I think I just used it in basic terms."

Now: "I think it's pretty good. I can do like a lot of basic stuff and so it's not like too difficult to like try something new."

Pseudonym: Christine

Age: 18

Nationality: American

Race: Caucasian/White

Gender: Female

Major: Open Option

Family Circumstances: Upper middle class

Proficiency with technology:

Before: "I mean, fairly decent ... it just depends like how new it is to me or like how big it is. Like I feel like with the computer, there's like so much to a computer, like, you have all this virus safety software and all this other software that's on it ... I always feel pretty confident with like phones. I can figure them out myself and like various Word sorts of things. And I can figure out scanners and printers pretty well... I mean, I feel like I--like if I sit down and really try to like figure the technology out, then I can figure it out..."

Now: "I don't know, it just depends ... like with my printer, I feel kind of lost sometimes [laughter], but it's just a printer. But like with the various -- like I feel like I can figure it out if I try or if I really want to. But then like when there's more like downloading software or knowing about viruses and various things like that, I'm just kind of like, "Oh my gosh, I just don't know." [laughter]. ...I can figure things out, like -- like Facebook or like Internet sorts of things, but, like, anything strange that pops up on my computer, I'm like, "Oh, no! It's a virus."

Pseudonym: Cody

Age: 18

Nationality: American

Race: Caucasian

Gender: Male

Major: Criminology

Family Circumstances: Upper middle class

Proficiency with technology:

Before college: “I’m pretty good. I mean, I never really had trouble with it, so. “

Now: “Probably pretty good. If I, if I can’t figure something out I can usually figure it out by myself.”

Pseudonym: Craig

Age: 43

Nationality: American

Race: White

Gender: Male

Major: Computer Technology--Networking

Family Circumstances: “I’m out of work and my wife works... We were very poor growing up. Did not have much.”

Proficiency with technology:

Before: “That’s a hard question. I mean could I turn on a computer? Yes. Could I operate one? Yes. Could I operate one fluently? No. And, that’s why I’m coming to college so I can operate one fluently.”

Now: “I think it’s improved greatly to be honest.”

Pseudonym: Daniel

Age: 17

Nationality: American

Race: Caucasian/White

Gender: Male

Major: Civil Engineering

Family Circumstances: Middle class

Proficiency with technology:

Before college: “Probably on a, a scale of 1 to 10, where 10 being a person that could take pretty much any piece of technology and get it to work, probably like a 4. I'm not, not nearly as good as most of the people I'm starting to meet here, or here or some of the people that I knew in high school that can, you know, it doesn't matter what you put in front of them, they can figure it out. But, I do understand how to run anything I need.”

Now: “Slightly more than-- slightly higher than before I came to [Keyboard] State...But, I haven't had to use it a ton yet.”

Pseudonym: Ellen

Age: 18

Nationality: American

Race: Caucasian/White

Gender: Female

Major: Microbiology

Family Circumstances: Middle class

Proficiency with technology:

Before: “I could usually accomplish what I needed to, but it generally--it, I would say it took me longer than other people just because I didn't frequent it as often, I didn't use it as much.”

Now: “I would say I'm more proficient just because I've had to use it more frequently. And, like with the database, I now at least have that first experience over with, so I'm a little more familiar. And I'd say the same goes with [Keyboard] State Online and using those websites. So, I'd say I'm definitely becoming more technology savvy.”

Pseudonym: Erica

Age: 18

Nationality: American

Race: White/Caucasian

Gender: Female

Major: Psychology

Family Circumstances: “My dad makes over 100,000 a year. So, we've been pretty stable. ... But it wasn't always that way.”

Proficiency with technology:

Before: “I thought it was pretty good... I could figure out how to do a lot of stuff. I didn't necessarily use it a lot, but I could figure it out if I needed to.”

Now: “I think I'm pretty good with it... it really doesn't ever trip me up very often, so I think I -- I can work with it really well, and if I don't know, I can usually figure it out pretty quick.”

Pseudonym: Jacob

Age: 18

Nationality: American

Race: ½ Filipino, 1/8 Welsh, 1/8 Irish, 1/8 Swedish, 1/8 English

Gender: Male

Major: Psychology

Family Circumstances: Middle class

Proficiency with technology:

Before: “Before coming to college, um, very proficient...I wouldn't say that I know how to use every single aspect of every single thing ever made, but I could, I could learn something if I didn't know it, but I would, I would say that for what we need to do in college...I know how to do it. “

Now: “Very high. Yeah. Yeah, and I, I think that, like coming out of high school like I was going, I was just going up. And then, I was kind of afraid that it would just kind of stay but it's definitely, it's definitely still has gone up and I'm using it definitely more than I thought I would in -- at [Keyboard State].”

Pseudonym: Lisa

Age: 18

Nationality: American

Race: Caucasian

Gender: Female

Major: Pre-Nursing/Life-Sciences

Family Circumstances: Middle class

Proficiency with technology:

Before college: “I would say it's, I'm pretty, like adequate. I know how to work a lot of things but there are definitely some programs and stuff that I'm not comfortable with.”

Now: “Pretty good.”

Pseudonym: Michael

Age: 19

Nationality: American

Race: White

Gender: Male

Major: Criminology

Family Circumstances: Lower middle class

Proficiency with technology:

Before: “I was good at video games, that's... I can use the computer for basically anything I need to for school, but I can't do anything really beyond that.”

Now: “Adequate... I can do it.”

Pseudonym: Mingxia

Age: 19

Nationality: Chinese

Race: Asian

Gender: Female

Major: Open Option

Family Circumstances: Middle class

Proficiency with technology:

Before: “I don't, I don't think I'm good. But I try to catch up with the... I try to follow the step. I don't want to be... out fashion.”

Now: “I don't think I'm good. So I decide to minor in Computer Science.”

Pseudonym: Nate

Age: 18

Nationality: American

Race: Caucasian

Gender: Male

Major: Open Option

Family Circumstances: Middle class

Proficiency with technology:

Before: “Like I said, before coming to college didn't, didn't really check my email as much... I still don't know any CAD designing software but I, I hope to learn it. But, obviously I don't know anything right now so I didn't know anything before ... And ideally, I'll improve in that field.

Other than that I really was fairly proficient in technology, social networking, Word documents, PowerPoints, Excel, you know all, all the lot. Researching and any, anything that I would really need for, ah, educational purposes I, I had down pat.”

Now: “Moderate. I'm not grandma, figuring out how to, how to use a word processing program... but I have enough of a working knowledge to go through, the very least my first semester of ...college. “

Pseudonym: Rachel

Age: 18

Nationality: American

Race: Caucasian/White

Gender: Female

Major: Open Option

Family Circumstances: Middle class

Proficiency with technology:

Before: “Actually, I realize that I am pretty proficient in all the important things, but when I was coming here I was kind of nervous because I was like, what if I have to send papers to my teachers and what if I don't know how to do that? But I realize, I, I do know most of the stuff that I have to know. And all the stuff that I don't know about isn't very necessary at the moment. So I was a little nervous about that but I'm, I'm pretty fine on just getting by. I, I don't think I'm proficient though.”

Now: “Well, I'm pretty proficient with everything that I need to know. Of course the maybe social media or e-book things that I don't have I'm not proficient with. But, if I have them I could become proficient. But, I'm pretty well rounded in all the areas that are important right now.”

Pseudonym: Samantha

Age: 18

Nationality: American

Race: Caucasian

Gender: Female

Major: Open Option

Family Circumstances: Working class

Proficiency with technology:

Before: “I definitely relied on other people to make sure that stuff was working... I'm really not very independent with technology because I don't know too much about it, yet.”

Now: “Pretty good. Well, I mean, there's stuff that I don't have that I have no idea how to use, but as for the stuff I have, I guess pretty good. That's for the stuff that I care about. Like, video games and stuff still confuses me how to hook up everything, so I don't know anything about that, but I don't use it. So, as for what I use, I feel pretty, pretty okay.”

Pseudonym: Yolanda

Age: 18

Nationality: American

Race: Other: Black, Caucasian, Native American

Gender: Female

Major: Physical therapy, minor in leadership

Family Circumstances: Lower class.

Proficiency with technology:

Before college: “I was decent, like, I wasn't like clueless. But like, as far as like the library database search that we've used, I would never think there was nothing like that... Yeah. I wasn't aware of, like, stuff like that. But, like, I was pretty much aware of everything else. “

Now: “Just the same.”

Appendix B - Faculty Participant Profiles

Pseudonym: Professor Xavier

Field: Humanities

Years teaching first-year students: 4-5 years

Comfort level with technology: “Ten being I, I'm so in love with it I just cannot be without it and one being I, I'm a nihilist and I hate all technologies. I would say that I am probably around a, a six.”

Level incorporate technology into classes: “... in my [first –year] class um, I have decided to keep technology in, at least during my classroom times, at almost a zero percent.”

Pseudonym: Professor Bhaer

Department: Academic Support

Years teaching first-year students: 8

Comfort level with technology: “ 75% comfort...Above average.”

Level incorporate technology into classes: “Also above average.”

Pseudonym: Professor Darnay

Department: Arts

Years teaching first-year students: 8

Comfort level with technology: “I don't know. I like technology, a lot. I'm, I'm pretty good at using it. I'm not real good at programming it.”

Level incorporate technology into classes: “I would give it a medium... about medium.”

Pseudonym: Professor Dashwood

Department: Humanities

Years teaching first-year students: 9

Comfort level with technology: “I'm learning. I don't feel uncomfortable with it, but I'm aware that because of the way I learn that the process is pretty methodical and slow.”

Level incorporate technology into classes: “It's much higher than it has been. And certainly it's much higher than when I started teaching at [Keyboard State].”

Pseudonym: Professor Eyre

Department: Sciences

Years teaching first-year students: 4-5

Comfort level with technology: “I think that depends on what we're-- which technology we're talking about.”

Level incorporate technology into classes: “I would say-- if, if you want to call it delivery of course information through PowerPoint, you know, like I said audio files, video files. Um. I embed movie clips or we'll go online and watch things, you know, related to the course, so that, that's -- pretty high level of that sort of thing.”

Pseudonym: Professor Fforde

Department: Sciences

Years teaching first-year students: 15

Comfort level with technology: “I think, I think I'm pretty comfortable using it. I...I don't go out of my way to try to find technology, because I still think that there's a fundamental role for the one-on-one personal and -- personal delivery of content. But, I'm pretty comfortable. There's nothing that scares me about technology.”

Level incorporate technology into classes: “Well, we use one type of technology or other every class, I would say.”

Appendix C - Information and Communication Technologies

Definition Handout

Information and communication technologies include, but are not limited to, computers and other technology that you can use to do the following with information:

- Communicate
- Search for
- Create
- Edit
- Store
- Share

Examples of ICTs may include, but are not limited to:

- Computers: laptops, tablets, desktops, netbooks
- Scanners and printers
- Cell phones (from basic call only, to texting, to smartphones)
- Software: word processing, spreadsheets, image editing, audio mixing
- Email, IM, Skype
- K-State Online or other course management systems
- Library databases, ebooks, textbook websites
- E-book readers (Kindle, Nook, etc.)
- Wikis, blogs, message boards
- Games, especially if there is a social aspect to them
- Twitter, Facebook, LinkedIn

Appendix D - Informed Consent Form

KANSAS STATE UNIVERSITY INFORMED CONSENT FORM

PROJECT TITLE: First-Year College Students' Perceptions of Their Experiences With Information and Communication Technologies in Higher Education

APPROVAL DATE OF PROJECT: EXPIRATION DATE OF PROJECT:

INVESTIGATORS : Sara K. Kearns, skearns@ksu.edu, 785-532-7446

Dr. Christy Moran Craft, ccraft@ksu.edu, 785-532-5940

IRB CHAIR CONTACT/PHONE INFORMATION:

- Rick Scheidt, Chair, Committee on Research Involving Human Subjects, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.
- Jerry Jaax, Associate Vice President for Research Compliance and University Veterinarian, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.

PURPOSE OF THE RESEARCH: The purpose of this study is to better understand the experiences of students with technology during the students' first year of college. The study is being conducted to help university instructors and student services professionals more effectively use technology for student learning and support.

PROCEDURES OR METHODS TO BE USED: Participants in this study will include students and instructors from Kansas State University. Student participants will be interviewed two times each for approximately one hour each time at an agreed upon campus location. Student

participants will also have the opportunity to participate in a focus group with other students that will last for approximately one hour at an agreed upon campus location.

Faculty participants will be interviewed one time for approximately one hour at an agreed upon campus location.

All interviews will be audio-recorded.

LENGTH OF STUDY: Interviews will be conducted from August to December 2012. Participants will be invited to review transcripts until approximately January 2013. Participants will be invited to review and comment upon themes and descriptions of the common, shared experiences identified through this study until approximately April 2013.

RISKS OR DISCOMFORTS ANTICIPATED: There are no foreseeable risks of participation in this study.

BENEFITS ANTICIPATED: Participants will benefit indirectly from providing input that can improve how information and communication technology is used with student learning and support services in higher education.

EXTENT OF CONFIDENTIALITY: Only the investigators in this study will know participant identities. Pseudonyms will be used throughout the final written report. Individual names will not be associated with responses.

TERMS OF PARTICIPATION: I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled.

I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.

Participant Name:

Participant Signature:

Date:

Witness to Signature:

Date:

Appendix E - Student Individual Interview #1 Guide

Hi _____,

Thank you for your willingness to participate in my research study about how first-year students experience information and communication technologies in higher education. This study will be the focus of my dissertation as I am pursuing a doctoral degree in Student Affairs in Higher Education through Kansas State University's College of Education. Hopefully, this study will be helpful to university faculty, instructors, and other staff who are designing courses and services that integrate information and communication technologies for first-year students.

While I will be asking you for demographic information in order to ensure that I am including a diversity of students in this study, I want to be sure that you understand that your identity will remain confidential. When discussing your experiences in my research, I will change your name and the names of those related to your experiences, such as your instructors or friends. If you wish, you may choose your own pseudonym. Do you have any questions about the "informed consent form" you have been provided?

As we discussed via email (or on the phone), I will be making an audio recording of our conversation. This will ensure that I can focus my attention on you while still recording the entirety of your answers. I may write brief notes to myself as we talk, but I will try to keep those to a minimum. Once I have transcribed our interview, I will share it with you so that you may review it and verify our discussion.

During our interview today, I will be asking you questions about your experiences with information and communication technologies, predominantly from prior to you coming to college. I will be asking you for details, as best as you can recall them. There truly is no right or wrong answer. The most important thing about this interview is that you are able to describe your experiences as you remember them. Please feel comfortable pausing to reflect and recall your specific experiences. You will also have the opportunity at the end of our interview to return to prior questions; if you remember another detail or wish to clarify an answer, you may do so. At the end of the interview, you may also ask me questions about my research, which I will answer to the best of my ability.

Before we move on to the interview questions, I would like to revisit the definition of information and communication technologies that I shared with you via email and that I've used in seeking participants for this study. I've prepared this as a handout that you can refer to during our interview. Essentially, information and communication technologies include, but are not limited to, computers and other technology that you can use to do the following with information:

- Communicate
- Search for
- Create
- Edit
- Store
- Share

Examples of ICTs may include, but are not limited to:

- Computers (laptops, tablets, desktops), scanners, printers
- Cell phones (from basic call only, to texting, to smartphones)
- Software: word processing, spreadsheets, image editing, audio mixing
- Email, IM, Skype
- K-State Online or other course management systems
- Library databases, ebooks, textbook websites
- Wikis, blogs, message boards
- Games, especially if there is a social aspect to them
- Twitter, Facebook, LinkedIn

Do you have any questions about information and communication technologies?

Because information and communication technology is such a long phrase, we can use something shorter like "ICTs" or "technology" or "tech" during our interview. What term would you prefer?

Do you have any other questions before we begin?

1. First, I would like to gather some basic demographic information about you:

a. Name

- b. Age
 - c. Nationality
 - d. Race
 - e. Gender
 - f. Major
 - g. How would you describe your personal or family circumstances?
2. What is the first technology you can remember using?
- a. How did you feel about that technology?
 - b. How did you learn how to use it?
 - c. What people do you associate with this technology?
 - d. What role did they play?
 - e. How do you think your experience with that technology affected significant other people in your life?
 - f. How did your behavior change because you used that technology?
3. Tell me about how your family used technology when you were growing up.
- a. Who in your family used technology the most?
 - b. Why do you think she/he used the technology?
 - c. Did she/he ever show you how to use technology?
 - d. Who in your family used technology the least?
 - e. Why do you think she/he used technology the least?
 - f. Who in your family do you think changed the most in their use of technology?
 - g. Why do you think they changed so much?
 - h. What role did you play in your family when it came to technology?
 - i. How did that make you feel?
4. Tell me about how your friends used technology when you were growing up.
- a. Who of your friends used technology the most?
 - b. Why do you think she/he used the technology?
 - c. Did she/he ever show you how to use technology?
 - d. Who of your friends used technology the least?
 - e. Why do you think she/he used technology the least?
 - f. Who of your friends do you think changed the most in their use of technology?

- g. Why do you think they changed so much?
 - h. What role did you play with your friends when it came to technology?
 - i. How did that make you feel?
5. Now I would like to ask you to think about a specific experience that you have had with technology that is typical of your experience before college.
- a. What was the technology?
 - b. Why were you using it?
 - c. Had you ever used it before?
 - d. How did you learn to use it?
 - e. What thoughts do you remember from this experience?
 - f. What emotions did you feel?
 - g. What people do you associate with this experience?
 - h. What role did they play?
 - i. How do you think your experience affected significant other people in your life?
 - j. Has your behavior changed because of this experience?
 - k. Do you think differently about technology because of this experience?
 - l. Has this experience changed how you think about yourself?
 - m. Is there anything else you would like to share about this experience?
6. Now I would like to ask you to think about an atypical or unusual experience you that you had with technology before college.
- a. What was the technology?
 - b. Why were you using it?
 - c. Had you ever used it before?
 - d. How did you learn to use it?
 - e. What thoughts do you remember from this experience?
 - f. What emotions did you feel?
 - g. What people do you associate with this experience?
 - h. What role did they play?
 - i. How do you think your experience affected significant other people in your life?
 - j. Has your behavior changed because of this experience?
 - k. Do you think differently about technology because of this experience?

- l. Has this experience changed how you think about yourself?
 - m. Is there anything else you would like to share about this experience?
7. Have you ever learned to use a technology just because you wanted to?
 - a. Why/Why not?
 - b. How did you learn how to use it?
 - c. What thoughts do you remember from this experience?
 - d. What emotions did you feel?
 - e. What people do you associate with this experience?
 - f. What role did they play?
 - g. How do you think your experience affected significant other people in your life?
 - h. Has your behavior changed because of this experience?
 - i. Do you think differently about technology because of this experience?
 - j. Has this experience changed how you think about yourself?
 - k. Is there anything else you would like to share about this experience?
8. Have you ever taught someone else to use a technology?
 - a. Why/Why not?
 - b. How did you teach them how to use it?
 - c. What thoughts do you remember from this experience?
 - d. What emotions did you feel?
 - e. What people do you associate with this experience?
 - f. What role did they play?
 - g. How do you think your experience affected significant other people in your life?
 - h. Has your behavior changed because of this experience?
 - i. Do you think differently about technology because of this experience?
 - j. Has this experience changed how you think about yourself?
 - k. Is there anything else you would like to share about this experience?
9. How would you describe your proficiency technology before coming to college?
10. Is there anything else you would like to tell me about your experiences with technology before college?

Thank you very much for taking the time to answer my questions so thoroughly. In a few days, I will send you the transcript of this interview so that you may check it to insure that it accurately captures your responses. If you do have any edits or corrections, please make them and return the document to me as soon as you can. We will also have an opportunity at the beginning of our next meeting to follow up on or clarify any of your responses. Thank you again, for your interest and participation are invaluable to this study.

Appendix F - Student Individual Interview #2 Guide

Hi _____,

Thank you for your willingness to continue participating in my research study about how first-year students experience information and communication technologies in higher education. As we discussed before, this study will be the focus of my dissertation as I am pursuing a doctoral degree in Student Affairs in Higher Education through Kansas State University's College of Education. Hopefully, this study will be helpful to university faculty, instructors, and other staff who are designing courses and services that integrate information and communication technologies for first-year students.

I want to be sure that you understand that your identity will remain confidential. When discussing your experiences in my research, I will change your name and the names of those related to your experiences, such as your instructors or friends. Do you have any questions about the "informed consent form" you have been provided?

As with our last interview, I will be making an audio recording of our conversation. This will ensure that I can focus my attention on you while still recording the entirety of your answers. I may write brief notes to myself as we talk, but I will try to keep those to a minimum. Once I have transcribed our interview, I will share it with you so that you may review it and verify our discussion.

During our interview today, I will be asking you questions about your experiences with information and communication technologies, predominantly in relation to your experiences as a first-year college student. I will be asking you for details, as best as you can recall them. There truly is no right or wrong answer. The most important thing about this interview is that you are able to describe your experiences as you remember them. Please feel comfortable pausing to reflect and recall your specific experiences. You will also have the opportunity at the end of our interview to return to prior questions; if you remember another detail or wish to clarify an answer, you may do so. At the end of the interview, you may also ask me questions about my research, which I will answer to the best of my ability.

Before we move on to the interview questions, I would like to revisit the definition of information and communication technologies that I shared with you via email and that I've used

in seeking participants for this study. I've prepared this as a handout that you can refer to during our interview. Essentially, information and communication technologies include, but are not limited to, computers and other technology that you can use to do the following with information:

- Communicate
- Search for
- Create
- Edit
- Store
- Share

Examples of ICTs may include, but are not limited to:

- Computers (laptops, tablets, desktops), scanners, printers
- Cell phones (from basic call only, to texting, to smartphones)
- Software: word processing, spreadsheets, image editing, audio mixing
- Email, IM, Skype
- K-State Online or other course management systems
- Library databases, ebooks, textbook websites
- Wikis, blogs, message boards
- Games, especially if there is a social aspect to them
- Twitter, Facebook, LinkedIn

Do you have any questions about information and communication technologies?

Because information and communication technology is such a long phrase, we can use something shorter like "ICTs" or "technology" or "tech" during our interview. What term would you prefer?

Do you have any other questions before we begin?

1. During our last interview we discussed your use of technology before coming to college. Are there any topics from that interview that you wanted to briefly return to?
2. What technology did you bring with you to K-State or purchase special for college?
 - a. How did you decide what technology you wanted or needed to bring?

- b. Did you have to learn how to use any of the technology?
 - c. What technology did you want to bring or purchase but were unable to?
3. What are some technologies your instructors expect you to use?
- a. Do you use it?
 - b. Why/Why not?
 - c. How did you learn how to use it?
 - d. How did you feel when the first time you were expected to use it?
 - e. How do you feel about using it now?
- [Repeat *a, b, c, d, e* for other ICTs]
4. What are some technologies that you expect or expected your instructors to use?
- a. Why?
 - b. Do they use it?
 - c. Have you ever specifically suggested that they use it?
 - d. If so, what was their response?
5. What are some technologies your classmates expect you to use?
- a. Do you use it?
 - b. Why?
 - c. How did you learn how to use it?
 - d. How did you feel when the first time you were expected to use it?
 - e. How do you feel about using it now?
- [Repeat *a, b, c, d, e* for other ICTs]
6. What are some technologies that you expect your classmates to use?
- a. Why?
 - b. Do they use it?
 - c. Have you ever specifically requested that they use it?
 - d. If so, what was their response?
7. What are some technologies that your friends expect you to use?
- a. Do you use it?
 - b. Why?
 - c. How did you learn how to use it?
 - d. How did you feel when the first time you were expected to use it?

- e. How do you feel about using it now?
[Repeat *a, b, c, d, e* for other ICTs]
8. What are some technologies that you expect your friends to use?
- Why?
 - Do they use it?
 - Have you ever specifically requested that they use it?
 - If so, what was their response?
9. Now I would like to ask you to think about a specific experience that you have had with technology this semester that is typical of your experience with technology in college.
- What was the technology?
 - Why were you using it?
 - Had you ever used it before?
 - How did you learn to use it?
 - What thoughts do you remember from this experience?
 - What emotions did you feel?
 - What people do you associate with this experience?
 - What role did they play?
 - How do you think your experience affected significant other people in your life?
 - Has your behavior changed because of this experience?
 - Do you think differently about technology because of this experience?
 - Has this experience changed how you think about yourself?
 - Is there anything else you would like to share about this experience?
10. Now I would like to ask you to think about an atypical or unusual experience you that you have had with technology in college.
- What was the technology ?
 - Why were you using it?
 - Had you ever used it before?
 - How did you learn to use it?
 - What thoughts do you remember from this experience?
 - What emotions did you feel?
 - What people do you associate with this experience?

- h. What role did they play?
 - i. How do you think your experience affected significant other people in your life?
 - j. Has your behavior changed because of this experience?
 - k. Do you think differently about technology because of this experience?
 - l. Has this experience changed how you think about yourself?
 - m. Is there anything else you would like to share about this experience?
11. Have you learned to use a technology this semester just because you wanted to?
- a. Why/Why not?
 - b. How did you learn how to use it?
 - c. What thoughts do you remember from this experience?
 - d. What emotions did you feel?
 - e. What people do you associate with this experience?
 - f. What role did they play?
 - g. How do you think your experience affected significant other people in your life?
 - h. Has your behavior changed because of this experience?
 - i. Do you think differently about technology because of this experience?
 - j. Has this experience changed how you think about yourself?
 - k. Is there anything else you would like to share about this experience?
12. How would you describe your proficiency with technology now?
13. Is there anything else you would like to tell me about your experiences with technology as a first-year student?

Thank you very much for taking the time to answer my questions so thoroughly. In a few days, I will send you the transcript of this interview so that you may check it to insure that it accurately captures your responses. If you do have any edits or corrections, please make them and return the document to me as soon as you can.

I will be conducting focus groups with other first-year students who also participated in these interviews. There will be two focus groups, one for students who feel that they are proficient with technology and one for students who do not feel that they are proficient with technology. The information from the focus groups will help us learn more about how first-year

students experience technology in college. The focus groups will last about an hour and there will be food provided. Are you interested in participating?

Thank you very much for taking the time to answer my questions so thoroughly. Your interest and participation have been invaluable to this study.

Appendix G - Focus Group Guide

Thank you all for agreeing to participate in this focus group. This focus group is part of my research study about how first-year students experience information and communication technologies in higher education. This study will be the focus of my dissertation as I am pursuing a doctoral degree in Student Affairs in Higher Education through Kansas State University's College of Education. Hopefully, this study will be helpful to university faculty, instructors, and other staff who are designing courses and services for first-year students that integrate information and communication technologies.

For the purposes of my study your identities will remain confidential. When discussing your experiences in my research, I will change your name and the names of those related to your experiences, such as your instructors or friends. If you have already chosen a pseudonym, I will continue to use that. Do you have any questions about the "informed consent form" you have been provided?

I will be making an audio-recording of our conversation. This will ensure that I can focus on your responses while still recording the entirety of your answers. I may write brief notes to myself as we talk, but I will try to keep those to a minimum. Once I have transcribed our focus group, I will share it with you so that you may review it and verify our discussion.

During our focus group today, I will be asking you questions about your experiences with information and communication technologies, predominantly in relation to your experiences as first-year college students. Everyone in this group identified themselves as feeling proficient with/not feeling proficient with ICTs. Please feel comfortable pausing to reflect and recall your specific experiences. Through this session, I hope to gather multiple viewpoints and encourage everyone to speak up, even if your response may not be in agreement with others in the group. There are no right or wrong answers, only your perceptions or memories of your experiences. Out of respect for each other, please speak one at a time and keep responses by all participants confidential.

At the end of the focus group, you may also ask me questions about my research, which I will answer to the best of my ability.

Before we move on to the questions, I would like to revisit the definition of information and communication technologies that I shared with you via email and that I've used in seeking

participants for this study. I've prepared this as a handout that you can each refer to during the focus group. Essentially, information and communication technologies include, but are not limited to, computers and other technology that you can use to do the following with information:

- Communicate
- Search for
- Create
- Edit
- Store
- Share

Examples of ICTs may include, but are not limited to:

- Computers (laptops, tablets, desktops), scanners, printers
- Cell phones (from basic call only, to texting, to smartphones)
- Software: word processing, spreadsheets, image editing, audio mixing
- Email, IM, Skype
- K-State Online or other course management systems
- Library databases, ebooks, textbook websites
- Wikis, blogs, message boards
- Games, especially if there is a social aspect to them
- Twitter, Facebook, LinkedIn

Do you have any questions about information and communication technologies?

Do you have any other questions before we begin?

For the purpose of this focus group, I am going to shorten “information and communication technologies” to “technologies.”

1. Please use the piece of paper provided to write down the first three words that come to mine when I say, “technologies.” We will then go around and each read your words. Even if your words have already been said, go ahead and read them again.
2. In general, why do you use technology in college?
3. How do you feel when you use technology?

4. Have you always felt this way about technology?
5. Who do you think has the most influence on your attitudes toward technology?
6. Have your attitude about technologies changed at all this semester? Why?
7. Do you believe you are defined by your ability to use technologies?

Thank you very much for taking the time to answer my questions so thoroughly. In a few days, I will send you the transcript of this focus group so that you may check it to insure that it accurately captures your responses. If you do have any edits or corrections to your statements, please make them and return the document to me as soon as you can. Thank you again, your interest and participation are invaluable to this study.

Appendix H - Individual Faculty Interview

Hi _____,

Thank you for your willingness to participate in my research study about how first-year students experience information and communication technologies in higher education. This study will be the focus of my dissertation as I am pursuing a doctoral degree in Student Affairs in Higher Education through Kansas State University's College of Education. Hopefully, this study will be helpful to university faculty, instructors, and other staff who are designing courses and services that integrate information and communication technologies for first-year students.

While I will be asking you for demographic information in order to ensure that I am including a diversity of faculty in this study, I want to be sure that you understand that your identity will remain confidential. When discussing your experiences in my research, I will change your name and the names of those related to your experiences, such as your students. If you wish, you may choose your own pseudonym. Do you have any questions about the "informed consent form" you have been provided?

As we discussed via email (or on the phone), I will be making an audio recording of our conversation. This will ensure that I can focus my attention on you while still recording the entirety of your answers. I may write brief notes to myself as we talk, but I will try to keep those to a minimum. Once I have transcribed our interview, I will share it with you so that you may review it and verify our discussion.

During our interview today, I will be asking you questions about your experiences with information and communication technologies in regards to your work teaching first-year students. I will be asking you for details, as best as you can recall them. There truly is no right or wrong answer. The most important thing about this interview is that you are able to describe your experiences as you remember them. Please feel comfortable pausing to reflect and recall your specific experiences. You will also have the opportunity at the end of our interview to return to prior questions; if you remember another detail or wish to clarify an answer, you may do so. At the end of the interview, you may also ask me questions about my research, which I will answer to the best of my ability.

Before we move on to the interview questions, I would like to revisit the definition of information and communication technologies that I shared with you via email and that I've used

in seeking participants for this study. I've prepared this as a handout that you can refer to during our interview. Essentially, information and communication technologies include, but are not limited to, computers and other technology that you can use to do the following with information:

- Communicate
- Search for
- Create
- Edit
- Store
- Share

Examples of ICTs may include, but are not limited to:

- Computers (laptops, tablets, desktops), scanners, printers
- Cell phones (from basic call only, to texting, to smartphones)
- Software: word processing, spreadsheets, image editing, audio mixing
- Email, IM, Skype
- K-State Online or other course management systems
- Library databases, ebooks, textbook websites
- Wikis, blogs, message boards
- Games, especially if there is a social aspect to them
- Twitter, Facebook, LinkedIn

Do you have any questions about information and communication technologies?

Because information and communication technology is such a long phrase, we can use something shorter like "ICTs" or "technology" or "tech" during our interview. What term would you prefer?

Do you have any other questions before we begin?

1. First, I would like to gather some basic demographic information about you:
 - a. Name
 - b. Department
 - c. Years teaching first-year students

- d. How would you describe your comfort level with technology?
 - e. How would you describe the level at which you incorporate technology into your class with first-year students?
2. What technology do you use most frequently?
 - a. Why?
 - b. How did you learn to use it?
 - c. How did you feel the first time you used it?
 - d. How do you feel about using it now?
 - e. Have you ever taught someone else to use it?
 - f. What was that experience like?
 3. What technologies do you use when you are teaching first-year students?
 - a. Why?
 - b. How did you learn to use it?
 - c. How did you feel the first time you used it?
 - d. How do you feel about using it now?
 - e. How do your students respond when you use it?
 - f. How do you feel when they respond this way?

[Repeat *a, b, c, d, e, f* for other ICTs]
 4. What are some technologies that you expect your first-year students to use?
 - a. Why?
 - b. Do they use it?
 - c. Have you ever specifically suggested that they use it?
 - d. If so, what was their response?
 - e. How do you know if the students know how to use the technology?
 - f. How do the students learn how to use the technology?
 - g. What happens if a student cannot use the technology?

[Repeat *a, b, c, d, e, f, g* for other ICTs]
 5. What are some technologies your first-year students expect you to use?
 - a. Do you use it?
 - b. Why/Why not?
 - c. How do you know your students expect you to use the technology?

- d. Did you have to learn how to use it?
 - e. How did you learn how to use it?
 - f. How did you feel the first time you used it with your students?
 - g. How do you feel about using it now?
- [Repeat *a, b, c, d, e, f, g* for other ICTs]
6. Now I would like to ask you to think about a specific experience that you have had with technology that is typical of your experience when teaching first-year students.
- a. What was the technology?
 - b. Why were you using it?
 - c. Had you ever used it before?
 - d. How did you learn to use it?
 - e. What thoughts do you remember from this experience?
 - f. What emotions did you feel?
 - g. What people do you associate with this experience?
 - h. What role did they play?
 - i. How do you think your experience affected significant other people in your life?
 - j. Has your behavior changed because of this experience?
 - k. Do you think differently about technology because of this experience?
 - l. Has this experience changed how you think about yourself?
 - m. Is there anything else you would like to share about this experience?
7. Now I would like to ask you to think about an atypical or unusual experience you that you had with technology when teaching first-year students.
- a. What was the technology?
 - b. Why were you using it?
 - c. Had you ever used it before?
 - d. How did you learn to use it?
 - e. What thoughts do you remember from this experience?
 - f. What emotions did you feel?
 - g. What people do you associate with this experience?
 - h. What role did they play?
 - i. How do you think your experience affected significant other people in your life?

- j. Has your behavior changed because of this experience?
- k. Do you think differently about technology because of this experience?
- l. Has this experience changed how you think about yourself?
- m. Is there anything else you would like to share about this experience?

Thank you very much for taking the time to answer my questions so thoroughly. In a few days, I will send you the transcript of this interview so that you may check it to insure that it accurately captures your responses. If you do have any edits or corrections, please make them and return the document to me as soon as you can. Thank you again, your interest and participation are invaluable to this study.