TEACHER EDUCATION AS DISTANCE EDUCATION:
PRE-SERVICE EXPERIENCE AND THE USES OF TECHNOLOGY

By

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ABSTRACT

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As colleges of education find their place in the digital age, there is considerable pressure to prepare their teacher candidates for life in the 21st century classroom. The call for more technology integration into teacher preparation assumes that students preparing to be teachers have the background and experience with technology to build upon. This study addresses two dimensions in the technology experiences of the group of students described with the generationally defined demographic term "Digital Native" and addresses a gap in the research on pre-service teacher candidates and their experience in a unique and completely distant teacher education internship. The research was completed through a qualitative, holistic single-case design focused on a single unit of analysis, the "Digital Native" pre-service teaching interns at a large, Midwestern research university (Yin, 2009, p. 46). This research tried to build on the work of Gruzd et al. (2012), which was the first study that used the Universal Theory of the Acceptance and Use of Technology for qualitative semi-structured interview research. Findings suggest that "facilitating conditions" and "effort expectancy" had the most influence on the acceptance and use of technology by "Digital Native" pre-service teaching interns in a distance learning program. Limitations of this research include concentration of the study on a single cohort of students in a unique pre-service internship program. Generalizing the results to other pre-service teacher distance education programs in different settings could be difficult.

To the women who have blazed the trail before me in information technology and education

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As colleges of education find their place in the digital age, there is considerable pressure to prepare their teacher candidates for life in the 21st century classroom. While the American Association of Colleges for Teacher Education reports that 62 percent of teacher colleges have a technology-related requirement for graduation or program completion, other organizations like the National Commission on Teaching and America's Future argue that more teacher education programs at colleges and universities need to have a stronger focus on technology, including blended learning for pre-service teacher courses and internships (Flanigan, 2015). The call for more technology integration into teacher preparation assumes that students preparing to be teachers have the background and experience with technology to build upon.

This study addresses two dimensions in the technology experiences of the group of students described with the generationally defined demographic term "Digital Native" based on their birth year along a time continuum from 1977 to 2002. They were brought together by their participation in a unique teaching apprenticeship program, whereby they spent this most important year learning how to be a teacher in an urban setting from mentors and field instructors, yet they were hours away from faculty, student peers, and the main campus of their university. Each student entered this crucial year of student teaching with varied backgrounds of experience with technology in their home life, in their K-12 education system, and through their undergraduate education. In the background of this study are how each of the students learned with technology throughout their young lives, how they interacted with technology at home, and what influence technology had on them as learners. If they were truly Digital Natives as defined by the popular media, each of them would have the innate ability to pick up any technology device and figure out how to use it within minutes, they would be able to learn new software

without so much as asking a friend or reading the user manual, or by the age of fourteen or fifteen they should have been able to create new media, upload it to the Internet, and share it through Web 2.0 tools.

Questions about the role of technology in the lives of Digital Natives are hotly debated in the popular media and more recently in scholarly articles. Some of this debate includes questions about how the shift of university courses and programs to online learning or blended learning affects learning experiences for students, especially their use of technology to mediate their learning. However, this study does not address all teacher preparation programs that employ distance education technology or formats, just this one unique case whereby the majority of communication and delivery of class content is delivered through distance education technologies to a generationally defined cohort of pre-service teachers. The second dimension of technology experience is the foreground of this study, which is the story of how each students technology experience as a Digital Native plays into their teaching internship year and shapes their ability to participate, collaborate, and learn with their faculty and peers on the home campus of the university through distance education.

Defining the Case Study

The debate over the effectiveness of distance learning has gone on long before online learning came to be in the early 1990's. Correspondence courses were viewed as inferior to traditional education, though for many, access to a quality education in their geographic area was not possible. Courses delivered using satellite technology in the 1970's and 1980's were criticized because of a lack of interaction between faculty and students, driven by the nature of the single direction delivery method very much like watching television. Yet, present time institutional leaders belief in the strategic importance of online learning has moved more and

more programs towards differentiated delivery methods for undergraduate and graduate education programs (Allen & Seaman, 2010, 2011, 2013; Allen, Seaman, & Garrett, 2007). In this same time period, Digital Natives have grown up with technology and post-secondary institutions have adopted online and blended learning models of distance education at a steadily growing pace (Allen & Seaman, 2013). Teacher preparation programs have not followed the national growth trend line of online and blended learning, but there is growth nonetheless. While the initial growth in online teacher preparation was incubated in the for-profit sector of higher education, in more recent years the expansion of such programs has been in traditional non-profit institutions. In 2010, The American Association of Colleges for Teacher Education (AACTE) reported that 73.7 percent of member schools offered distance –education courses (Liu, 2013). Western Governors University, a nonprofit, fully online university, is home to the first fully online teacher preparation program to be accredited by the National Council for Accreditation of Teacher Education (NCATE). The University of Massachusetts, through UMass Online, Liberty University, the University of Nebraska – Kearney, Drexel University Online, and the University of Cincinnati have all established distance undergraduate teacher preparation programs.

Distance education is the parent term for the many alternative distance learning methods that have been created as distance technology has advanced in mobility and delivery; subsets such as e-learning, flipped learning, open learning, and distributed learning. Online and blended learning also fall under the umbrella term of distance education, and various delivery methods of courses by different technology methods exist, such as video conferencing, satellite broadcast, course management systems, faculty managed websites, and mobile learning (Abdous & Yen, 2010). As noted by Moore, "Each of these subsets of distance education has generated its own following of specialists, some with their own journals, conferences, and an evolving corpus of

literature – a natural development in this, as in any, maturing field" (Moore, 2013, p. xiv). Do the experiences of being a Digital Native cross over into academic technology and distance education applications? There is limited research about this generation of students and their use of technology for learning, their experience with distance education, and particularly distance education for pre-service teacher programs during their student-teaching apprenticeship. Previous research has focused on first year undergraduate students that may or may not have been exposed to academic technology in their K-12 settings (Jones & Czerniewicz, 2010; Jones, Ramanau, Cross, & Healing, 2010; Kennedy, Judd, Dalgarno, & Waycott, 2010; Margaryan, Littlejohn, & Vojt, 2011; Ng, 2012; Selwyn, 2008). As a first year undergraduate, their exposure to academic technology in the higher education setting is limited by the short length of time that they have been present in the higher education student population. Capturing the experience of Digital Native students along the continuum of their full undergraduate experience provides a broader view of how they apply or do not apply their technology skills during a unique program mediated by information and communication technologies.

At a large Midwest research institution, the teacher education program has established a fifth-year teaching internship that includes four graduate level courses to coincide with student teaching responsibilities. Teaching interns begin their courses and student teaching internship the fall semester immediately following their undergraduate graduation from their teaching specialty major the previous spring semester. (Secondary teaching majors graduate from their subject area college. Special Education majors from the teacher education college). This teacher education program also has a specialized focus on urban education and it established a partnership with Big Lake City Public Schools to place teaching interns in the district. During the year-long internship, pre-service teachers communicate with faculty and peers and attend their courses

through asynchronous and synchronous distance education technology. As part of the Digital Native generation, the pre-service interns must navigate through technology while adapting to teaching responsibilities of the apprenticeship year.

The Big Lake City Public Schools Internship Program at Midwest State University

The teacher education program at Midwest State University is unique because pre-service teachers complete their bachelor's degree before spending an entire academic school year placed in one school with one mentor teacher. Most other teacher preparation programs require their teacher candidate to complete their student teaching in a K-12 setting during the senior year of the undergraduate degree program. Another unique characteristic of the teacher preparation program at Midwest State University is that teaching interns take four graduate level classes, two each semester, coinciding with their internship. Subject matter taught during the internship year includes professional roles, teaching practice, relationships of teachers to colleagues and parents, unit planning, and curriculum planning. During October of the internship year student teachers complete guided lead teaching, when they take partial control of the everyday teaching responsibilities from their mentor teacher. In February and March of the second semester they complete the lead teaching requirement, taking full responsibility for lesson planning, teaching, and grading in their internship classroom. The weeks preceding and after both lead teaching experiences, the interns are in the K-12 classroom four days a week and attend their graduate classes on the fifth day. Some of those classes are face-to-face and some are a combination of online components. The Big Lake City internship program follows the same design and format.

The pre-service teacher internship program partnership between the College of Education at Midwest State University and Big Lake City Public Schools intertwines the two dimensions of this study: Digital Natives and their experience with academic technology and distance education

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for pre-service teacher training. The cohorts of students participating in the teaching internship program are all within the realm of the definition of Digital Natives; born sometime between 1977 and 2002. Most have used academic technologies during the four years of their undergraduate program, with varying levels of experience. The Big Lake City teaching internship program is a mixture of distance education delivery formats; unique for its use of video conferencing, online modules and collaboration in a pseudo-blended learning format. It follows the blended format of the on-campus face-to-face program of meeting 50% or more online and the rest in-person. However, instead of attending class in-person on the campus of Midwest State University, the teaching interns have the added distance education format of attending their classes using videoconferencing, connecting to the campus of Midwest State University from a partner school in Big Lake City Public Schools. The program and the technology used to facilitate the interns participating in their classes have evolved since it started in 2008.

Since 1994, the secondary and elementary teacher preparation programs in the College of Education at Midwest State University have been ranked as one of the top five programs by the U.S. News and World Report annual college rankings survey. The college also has a strong commitment to diversified education experiences, including having an Urban Educators program to present teaching candidates the opportunity experience teaching in urban settings. As a result of the rankings and urban educators program, Big Lake City Public Schools approached the College of Education about forming a partnership to place pre-service teaching interns in the district. In 2008, the program began with a cohort of elementary education interns (Anagnostopoulos, 2013). They attended their graduate level classes asynchronously using Polycom video conferencing with a single instructor at Midwest State University, while their

peers on campus met face-to-face in a typical classroom setting. For the second year, secondary education teaching interns were added to the program connecting synchronously using desktop video conferencing software (Adobe Connect) to the classes attended by their peers at Midwest State. In the third year of the program, special education teaching interns were added to the Big Lake City cohort and similar to the secondary students, they attended their classes synchronously with their peers. In the years following, the elementary, secondary, and special education pre-service teaching interns followed the same format, with varying technologies deployed to keep them connected to their instructors and fellow teaching interns in at Midwest State University.

Since the beginning of the program, keeping the pre-service teaching interns connected with their instructors and peers has been mediated by a variety of information and communication technologies. The university course management system has been the access point for course materials, discussion boards, and assignment drop-boxes. Video communication tools used included a room-based video conferencing system (Polycom), Skype, Adobe Connect, Vidyo, ooVoo, and Zoom. Remote observations by field instructors have been facilitated with iPads and Facetime. In some settings, interns have been required to use a digital video camera to record their teaching lessons and upload the videos to a video-sharing site for field instructors to view and provide feedback. Many of these technologies have been deployed without input from the interns, assuming that as part of the Digital Native generation, technology would come easy to them and if not, they'd know how to figure it out.

Purpose of the Study

The purpose of this study is to investigate an experiment with teacher education as distance education with a small cohort of Digital Native pre-service teaching interns who have varying backgrounds with technology from their childhood and educational settings. This study

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addresses a gap in the research on Digital Natives as pre-service teacher candidates and their experience in a completely distant teacher education internship by attempting to answer the following research questions:

- What sense do Digital Native pre-service teaching interns make of their experience with technology and its affect on their growth throughout their education?
- What role does being a "Digital Native" play in the use of technology by pre-service teachers?
- How do Digital Native pre-service teaching interns participate and collaborate in asynchronous and synchronous distance education?
- What long-term uses might there be for distance learning in teacher education programs?

Theoretical Framework

To analyze the data, the Unified Theory of Acceptance and Use of Technology (UTAUT) was applied through the coding process. UTAUT is the fusion of eight prominent technology acceptance theories, including Davis' (1989) Technology Acceptance Model, Rogers' (1983) Diffusion of Innovation Theory, and Fishbein and Ajzen's (1975) Theory of Reasoned Action. Synthesis of the eight theories was based on conceptual and empirical similarities across the models. Since it's introduction by Venkatesh, Morris, Davis and Davis (2003), UTAUT has been used in over 40 quantitative studies. This study attempted to use the UTAUT model to build on the work of Gruzd, Staves, and Wilk (2012). Their study examining the role of social media in research practices of faculty was the first study to apply the UTAUT conceptual framework to qualitative research. Certainly, there are many complexities of technology with the rapid introduction of new devices and constant delivery of new Internet cloud-based services promising to be the next best thing. No one theory can capture all the dimensions and uses of

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technology in professional and pre-professional teaching. At the very least, a theory like UTAUT provides a vocabulary for understanding how different constructs can influence the adoption and use of technology.

This study examined the student interviews through the four main constructs that influence intention and usage of technology: Performance expectancy, Effort expectancy, Facilitating conditions, and Social influence. Each main factor is defined as:

- Social influence – "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451).

- Performance expectancy - "the degree to which an individual believes that using the system will help him or her to attain gains in job performance (Venkatesh et al., 2003, p. 447).

- Effort expectance – "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p.450).

- Facilitating conditions – "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003, p.453).

Venkatesh et al. (2003) also examined other moderating factors that may influence the four main factors as part of their original study, including "gender", "age", "experience", and "voluntariness of use." For the purposes of this study, "gender", "age", and "voluntariness of use" were not considered as part of the analysis due to the small sample size and single case study design within a unique program. However, pre-internship "experience" with technology was examined as a moderating influence on all four main factors.

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In the UTAUT model, each of the four main constructs is represented by statements such as: (1) "I would find the system useful in my job" (Performance expectancy), (2) "It would be easy for me to become skillful at using the system" (Effort expectancy), (3) "I have the knowledge necessary to use the system" (Facilitating conditions), and (4) "People who are important think that I should use the system" (Social influence). The statements from the model helped define the four main constructs and were included in the use of UTAUT for this study.

Limitations

A limitation of this study was that I am part of the team that made administrative decisions about the technology deployed for the Big Lake City program. From an ethical standpoint, since was "part of the world" I was studying (Maxwell, 2005, p. 109), I had to be aware of the influence I had on the individuals studied, or the activity during the observation process. Maxwell (2005) states that there is no way to avoid this or minimize it, but as the researcher, I should be aware of it and understand how my presence and position in the world of the intern program could have influenced what the interns said in the interviews. Another limitation was that the results of this study were concentrated on a single cohort of students in a unique pre-service urban education internship program. Generalizing the results to other pre-service teacher distance education programs in different settings could be difficult.

Chapter Two: Review of the Literature

The purpose of this literature review is to examine the history and views of Digital Natives in the popular press and empirical studies, explore previous research on distance education and the subsets of formats that can be categorized as distance education, and review research on distance education technology mediated pre-service teacher training.

Digital Natives

Since the start of the new millennium, writers in the popular press have defined the new generation of students that is passing through the K-12 educational system and entering the halls of higher education as either the Net Generation, Millennials, or Digital Natives. Any of these three labels refers to a generation of young people that have grown up digital, meaning they do not know of a world other than one mediated by the technology of the Internet, digital communication, computers, and playing online or console games (Oblinger & Oblinger, 2005; Prensky, 2001a; Tapscott, 1998, 2008). This generation was born sometime after 1977 and before the year 2002; the range of years varies depending on the author defining the time period (Jones & Czerniewicz, 2010). Being born during this time period immersed this generation in the rapid growth of digital technology that affects almost all facets of their daily lives, including their education, communication, and their social lives. This generation is described as a homogeneous group, coming to education systems with specific characteristics and with high expectations of how and what technology should be used for in teaching and learning.

Pre-service teacher candidates filling universities and colleges in present time are considered to be Digital Natives (Pensky, 2001; Palfrey and Gassar, 2008), the Net Generation (Tapscott 1998, 2009), or Millenials (Oblinger & Oblinger, 2005). They have been described as the generation that has grown up in the age of fast advancing technologies in computing,

communication, social networking, and mobile devices; they are digitally competent and technologically interested (Erstad, 2011). The sophisticated skills of this generation are "referred to as a level of 'digital literacy' or 'new media literacy'" ("New Media Literacies — Learning in a Participatory Culture," 2013). Digital literacy is, "The multiplicity of literacies associated with the use of digital technologies. These technologies are a subset of electronic technologies that include hardware and software used by individuals for educational, social and/or entertainment purposes in schools and at home" (Ng, 2012, p. 1066). Digital literacies are also sometimes referred to as twenty-first-century literacies. It is the ability of young people to navigate the Internet to locate and recognize high quality information; to manage their online identity and privacy; to recognize what to do with new technologies and digital texts; the ability to understand, use, and create new media (Erstad, 2011; Palfrey & Gasser, 2011). What does this mean for teacher education? If this generation is defined by the characteristics of the Digital Native persona, what kind of teachers will they become for future generations enveloped in the same (or greater) expanse of digital technology?

Digital media is an embedded part of the everyday lives of young people (Dahlstrom, Grunwald, de Boor, & Vockley, 2011; Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013; Smith, Rainie, & Zickuhr, 2011). Communication with others is done via texting, instant messaging, email, and social media sites such as Facebook, Twitter, Instagram, Tumblr, and Snapchat. Collaboration on coursework can be done using Web 2.0 tools such as Google Drive while members of a team chat via distance technology web conferencing services like Google Hangouts or Skype. No longer do class members need to travel to a brick and mortar building to participate in face-to-face classes. Video technologies and mobile devices host virtual class sessions with students on campus and with those who live hundreds or thousands of miles away.

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Digital Natives are being educated during a time of a participatory culture, "in which a significant portion of the population, not just a small professional guild, can participate in the production of cultural materials ranging from encyclopedia entries to videos watched by millions" (Rheingold, 2012, p. 115). But does participation in the creation of cultural artifacts equate to participation in academic online activities? Henry Jenkins (2009), an early proponent of the participatory culture idea, argues that there is a responsibility to rethink literacy education to include digital literacy with traditional literacy competencies, thus creating a new building block for social skills and peer feedback as writers and readers. Others argue that not only is participation important, but that other twenty-first century literacies are essential to learn, apply, and be "smart" in the digital age.

Cathy Davidson (2011) lists seventeen digital literacy skills that teachers at every level should be addressing: Attention, Participation, Collaboration, Network Awareness, Global Consciousness, Design, Affordance, Narrative (Storytelling), Procedural (Game) Literacy, Critical Consumption of Information, Digital Divides, Ethics, Assessment, Data Mining, Preservation, Sustainability, and Learning, Unlearning, and Relearning. This list is an expansion of the five skills defined by Howard Rheingold that he argues are "in the process of changing our world" and "when enough people become proficient at these skills, then healthy new economies, politics, societies, and cultures can emerge" (2012, p. 4). Rheingold's list includes attention, participation, collaboration, the critical consumption of information (aka "crap detection"), and network smarts. For the purposes of this study, I am focusing on participation and collaboration digital literacy skills of students enrolled in distance learning facilitated teacher education. Participation literacy utilizes a set of tools (discussion, curation, self-presentation, and persuasion) and includes involvement in online social settings (Rheingold, 2012). Collaboration

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integrates the collective intelligence of a group of people (small to enormous) to create, edit, fact-check, and complete online and offline artifacts. While participation and collaboration are prevalent and necessary in social media interactions of Digital Natives, are they willingly present in distance education?

Characteristics defined by media. Prensky (2001), the originator of the term Digital Native, describes this generation as "native speakers of the digital language of computers, video games, and the Internet" (p. 1) and Tapscott (1998, 2008), who named them the Net Generation, describes young people that relate to technology differently than their Baby Boomer parents could have ever imagined. Instead of being passive receivers of information through radio and television, the Net Generation interacts with information, digs deeper through hyperlinks, and creates their own digital content for sharing through social networks (Palfrey & Gasser, 2010; Tapscott, 1998; Watkins, 2009). This generation is also referred to by Oblinger and Oblinger (2005) as those that have never known life without the Internet. As stated by Prensky (2001), " They have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age" (p. 1). All of the resources of the Internet are instantaneously available through high-speed broadband and cellular networks via a personal computer, tablet (iPad), or Smartphone. Expeditious access to copious amounts of information is channeled through super search engines like Google, Yahoo, and Microsoft's Bing. But long before Google became a household name, the definition of a new digital generation was being shaped in popular media.

In 1998, Don Tapscott wrote in *Growing Up Digital: The Rise of the Net Generation* about the baby boom echo, a generation eighty million strong, where computers could be found in the home, school, and office and where digital cameras, video games, and CD-ROMs were

commonplace. Parents were fretting over how they would keep up with their digitally savvy

children "who know more about technology than they do" (1998, p. 2). He argued that parents,

teachers, policymakers, marketers, and business leaders had no bigger issue in front of them than

understanding what the digital expertise of this new generation meant for the future. This

generation was no longer content to accept the broadcast choice of programming through radio

and television, where someone else gets to decide the content for the masses; this digital

generation wants "to be users – not just viewers or listeners" (Tapscott, 1998, p. 3). Two years

after Tapscott's book became a bestseller, Pensky (2001) was introducing his version of the Net

Generation as Digital Natives and in 2005, Oblinger and Oblinger were writing about the

Millennials and the challenges presented to educators by this new generation. Out of all the

digital-savvy challenges presented to older generations, the ability of Digital Natives to multi-

task is the most challenging or the most alarming, depending on the point of view.

Meet a digital native on the street or in a classroom and they'll be sure to tell you, when

asked about their ownership of digital devices, how many they own or have had access to

growing up. Ownership of MP3 music players, mobile phones, and laptops by Digital Natives

has substantially increased over the last ten years. In 2009, Watkins reported that 93% of young

people owned a computer and 96% owned a mobile phone. More recently, the Educause Center

for Applied Research reported that of those that own a computer 86% of undergraduates own a

laptop and 62% of cell phone ownership is a Smartphone (Dahlstrom, 2012). With multiple ways

to connect to the Internet and media, Digital Natives are portrayed as avid multitaskers, using

multiple devices and technology at the same time to work, study, communicate, and keep up with

what is happening at any moment in time (Oblinger & Oblinger, 2005; Palfrey & Gasser, 2010;

Prensky, 2001a; Tapscott, 1998, 2008; Watkins, 2009). Watkins (2009) describes this activity

as, "Immersed in a world of media, they use as much of it as they can, any way that they can. Innovative as ever, the one sure way for young people to use all of the media and technology they own is to use it simultaneously" (p. 160). He continues by adding that American youth spend six hours a day with media and if you include simultaneous use of media, that figure grows to eight hours a day. Watkins admires Digital Natives for their ability to manage so many technology and media devices at once, characterizing them as "masterful multitaskers" (p. 160). He is not alone in this portrayal.

Tapscott (2008) paints a picture of Net Geners (his shortened term for Net Generation) that are just faster at switching tasks than previous generations, able to work effectively with "action" happening around them, multiple windows open on their Internet browser, three conversations via instant message, music from iTunes, and prompts from Facebook to check a comment or new friend status. He states, "I think they've learned to live in a world where they're bombarded with information, so that they can block out the TV or other distractions while they focus on the task at hand" (p. 108). Likewise, other authors describe this generation as having the ability to consume more media in the same amount of time than they have traditionally spent with media like TV, music, or print (Palfrey & Gasser, 2010; Prensky, 2001b). Finally, in the book *Educating the Net Generation*, Oblinger and Oblinger (2005) describe the Net Generation as, "moving quickly from one activity to another, sometimes performing them simultaneously. They have fast response times, whether playing a game or responding to an IM. In fact, more value may be placed on speed than on accuracy" (p. 2.6). Prensky (2001) defined this flurry of activity as "twitch speed" and argued that it is the mode of life most familiar to Digital Natives. Similarly, Palfrey and Gasser (2010) describe this action as a multistep process that "involves grazing, a 'deep dive,' and a feedback loop. They are perfecting the art of grazing through the

huge amount of information that comes their way on a daily basis" (p. 241). How this information is used by Digital Natives is ongoing debate in the academy, but in the popular press Digital Natives are creating their own digital content and interacting through the world of gaming and social media.

Like the Baby Boomers who considered television as a fact of life, so too is the computer to the Digital Natives. But the similarity stops there, because this generation interacts with computers and media, instead of growing up in the broadcast model of information dissemination (Tapscott, 2008). Digital Natives are described as diving in first and asking questions or reading the directions later. They prefer graphics over text, and want to be networked (Prensky, 2001a; Tapscott, 2008). Palfrey and Gasser (2010) describe a generation of young people that are "increasingly engaged in creating information, knowledge, and entertainment in online environments" (p.111) and yet, they go on to say that these creations are limited to activity on Facebook, Twitter, photo sharing sites, and on occasion editing an article on Wikipedia or posting to their own blog. The Pew Internet and American Life Project reported in 2004 that over half of American teens created content for the Web, and named this group of young Internet users, "Power Creators" (as reported in Watkins, 2009). This same group of "Power Creators" is said to be prolific gamers as well. Their need to create and interact with technology bleeds over from social networking and online surfing to playing massively multiplayer online role-playing games (MMORPGs) like *World of Warcraft*. Several of the popular media authors contend that because of the multiple action events happening in many MMORPGs, gaming sharpens the concentration of digital natives (Palfrey & Gasser, 2010; Prensky, 2001b; Tapscott, 1998). But how do these characteristics of the Digital Natives affect their role as students and learners?

To some, K-12 education and higher education are not moving fast enough to keep up with this new digital learner. The traditional classroom setting of the instructor as the *sage on stage* is boring and disengaging to this generation of students constantly managing multiple digital devices and constant streams of information. Prensky (2001a) argues that current educators are *Digital Immigrants*, who are part of the generation that grew up with a television and not computers in their living room. As immigrants to digital technology, they keep one foot in the non-digital world and slowly, if at all, adapt to using the Internet and digital tools for their everyday lives. As educators of Digital Natives, they "are struggling to teach a population that speaks an entirely new language" (Prensky, 2001a, p. 2) and "Often from the Natives' point of view their Digital Immigrant instructors make their education *not worth* paying attention to compared to everything else they experience – and then blame them for not paying attention" (Prensky, 2001a, p. 3). The call for changing curriculum and teaching methods includes bringing new digital media technologies, laptops, tablets, broadband Internet access, and social web applications is growing to promote active (doing) rather than passive (telling) learning (Prensky, 2001b; Tapscott, 2008; Watkins, 2009). The idea in the news media and public discourse about a large generational gap has led to an educational moral panic, whereby administrators at institutions are clamoring for changes in pedagogy and academics are asking for evidence of this gap between generations and the need for change (Bennett, Maton, & Kervin, 2008; Jones & Healing, 2010). Some authors write that the brain of Digital Natives has changed how it processes and learns in the digital age.

Today's students are characterized in the popular media by their ability to multitask among several digital technologies, their constant contact with peers and networks of friends through social media, and the ability to quickly immerse themselves in and understand new

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digital technology in what seems to be no time at all. According to Prensky (2001a), "…it is very likely that our students' brains have physically changed – and are different from ours – as a result of how they grew up" (p. 1). The scientific theory behind Prensky's statement comes from the field of neurobiology and the phenomenon known as neuroplasticity. It is the idea that the brain constantly reorganizes itself from childhood through adulthood and it "changes its structure and function in response to external experiences" (Wolfe & Brandt, 1998, p. 11). Prensky (2001a) argues the socialization of Digital Natives through thousands of hours of video game play, email, Internet browsing, text messaging, and watching television has created a generation with very different cognitive skills than previous generations and has produced a generation with superior visual skills, hand-eye coordination and the ability to multitask and react to parallel process events and stimuli. Others argue that the exposure to so much digital media and the multitasking habits of Digital Natives has reshaped the development of the brain, leaving areas of the frontal lobe, which is associated with critical thinking skills, impulse control, and attention span, underdeveloped (Small & Vorgan, 2009). Regardless of the arguments about positive or negative effects of technology exposure and use by the Digital Native generation on brain development, much of the literature has been in the popular press and not empirically researched.

Criticisms of popular media depiction of digital natives. While there are similar claims across the popular media about the characteristics of Digital Natives and hence a reason for educational systems to catch up to their "twitch speed" method of learning, most of the evidence presented is anecdotal. Tapscott (1998, 2008) used his own children's computing and multitasking habits as inspiration for both his books on the Net Generation, not taking into consideration that the use of the Internet differs between age groups within the same generation and socio-economic backgrounds. Prensky, Tapscott, and others based their claims on two

assumptions: young people of the Digital Native generation possess sophisticated knowledge of and skills with information technologies and as a result of their upbringing with information technologies they have a particular learning style preference different from earlier generations (Sue Bennett et al., 2008). Jones and Healing (2010) reiterate Bennett's idea of the "moral panic" that is not based on "adequate empirical or theoretical foundations" (p. 345), but on these two assumptions, which lead to a "polarized and deterministic debate in which change is inevitable, and those who resist change are portrayed as out of touch and not having legitimate concerns" (Jones and Healing (2010) as stated in Bennett et al. 2008, p. 782-783).

> Indeed, as their harshest critique of the assumptions about Digital Natives, Bennett and Maton (2010) state:

>> The lack of evidence for the existence of an entire generation of Digital Natives seriously undermines arguments made for radical change to education because of a proclaimed disjuncture between the needs of young people and their educational institutions. This is not to say that education should not change at all, but merely, that the basis of the argument, as it is currently made, is fundamentally flawed. (p.325).

This criticism of anecdotal evidence applies to specific assumptions about the role of multitasking, gaming, and social networking in the classroom.

In his 2008 article "Is Google Making Us Stupid?", Nicholas Carr lashes out at surface searching and learning that comes with the instantaneous results supplied by a Google search. Says Carr, "My mind now expects to take in information the way the Net distributes it: in a swiftly moving stream of particles" (2008, para. 4). In academics, how is the Digital Native "twitch speed" of operation verified as productive for learning and deep diving into critical

thinking skills? The popular media tells us that Digital Natives are just better at multitasking, that their brain has been rewired by digital technology and this applies to academic tasks as well as it applies to digital entertainment and communication (Palfrey & Gasser, 2010; Prensky, 2001b; Tapscott, 2008; Watkins, 2009). However, students' everyday technology activities may not be applicable to academic tasks. Finding cheats for a video game on the Internet may not have any relation to the skills necessary to do a search for legitimate resources for a school project or term paper (Bennett et al., 2008). While some students have the skill set to understand the difference between a deep search and skimming for the quickest answer, the idea of a homogeneous population with equal digital technology skills is not supported in the empirical evidence. Generalizations about Digital Natives also fail to recognize the cognitive differences in young people and fail to take into account preferences for different learning styles. Emerging research about the differences among Digital Natives and their relationship with digital technologies has just started to appear in peer-reviewed journals in the past three years.

Digital natives and academic technology research

The generation of young people enrolling in college in the past 10 years is coming to higher education institutions having gone through the first years of their life surrounded by digital technology for communication, information gathering, and socializing among peers and family. How much of that technology they use is questionable and their level of native expertise is proclaimed as expert level in the popular press. However, anecdotal evidence does not prove an assumption, nor does it apply across the board to each member of this generation in a homogenous fashion. The call by academics for more empirical evidence is being broadcast to help faculty and administrators better understand the technological skills that Digital Natives are bringing to campus and what they expect of their institutions for support, mentoring, and

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inclusion of technology in the face-to-face and online classroom (Jones & Czerniewicz, 2010). The current literature on Digital Natives and their use of the Internet, digital tools, and communication technology addresses three themes: a skill divided generation, what about technology is important, and what technology is important. In the following sections, I will address each theme.

      A skill divided generation. Mark Prensky, in *Digital Natives, Digital Immigrants*, paints a broad characterization of today's students stating, "Our students have changed radically. Today's students are no longer the people our educational system was designed to teach" (2001a, p. 1). Yet much of the current literature argues against this homogeneous picture of all students in this generation. The power users, similar to the term "Power Creators" used by the Pew Internet and American Life study in 2004 to describe teens prolific use of digital technology, are the minority in this generation (Jones et al., 2010; Kennedy et al., 2010; Y. Li & Ranieri, 2010; Thompson, 2013). Key technological tools identified as Web 2.0, such as wikis, blogs, and content creation tools, are only used by a minority of students (Jones et al., 2010). In a study of 2,096 first-year college students at three Australian universities, Kennedy et al (2010) found power users represented 14% of the sample while basic users represented 45% of the sample. Basic users "are characterized by extremely infrequent use of new and emerging technologies and less than weekly or monthly use of standard Web technologies. They are regular users of standard mobile features" (Kennedy et al., 2010, p. 337). Ordinary users, defined as regular users of standard Web and mobile technologies represented 27% or the sample and irregular users represented 14% of those sampled. While similar to ordinary users, irregular users engage in technology-based activities less frequently and even use of mobile technologies less often. Overall, all four classifications of users most frequently use standard web and mobile

technologies and that is where the similarities end. Furthermore, Jones and Healing (2010), in their survey of first-year students at five universities in England, found that 80% of students reported 'slight confidence with basic skills'; lower percentages expressed confidence using virtual learning environments (37.7%) and writing and commenting on blogs and wikis (40.6%). They argue that although there could be a difference in confidence based on students' prior use of digital technologies in their previous education, this evidence points to a less homogeneous generation of digital technology experts. So while Digital Natives are using technology in the academic setting, their skill level is varied, even at the most basic level, and power users appear to be in the minority.

What about technology is important? Similar to a variation in digital technology skill level and familiarity with emerging technology, digital natives have higher use of basic, everyday online technology and less use of more sophisticated Web 2.0 tools. Thompson (2013) in her study of digital natives as learners, found that students "may be using a narrower range of technology tools than the popular press authors claim, and they may not be exploiting the full benefits of these technology tools when using them in a learning context" (p. 35). So while undergraduate students have basic computer skills knowledge as frequent users of email, instant messaging, and Internet surfing, that does not necessarily apply to higher end technology skills (Kvavik, 2005; Margaryan et al., 2011; Selwyn, 2008). Ng (2012) concurs in the findings of his study of digital natives and digital literacy, concluding, "students do not engage as actively with content creation with Web 2.0 tools such as creating websites, keeping blogs or contributing to wikis. While the majority of the students in the study were familiar with these concepts, many have not used the tools for educational purposes to create artifacts online" (p. 1077).

According to popular press authors, digital natives are a homogeneous group of high

powered digital technology users that have sophisticated gaming skills and use web publishing

platforms to engage in constant multiple digital interactions. Add in multitasking as a key skill to

manage email, homework, instant messaging, and text messaging on their Smartphone and

popular press authors create an image of a finely tuned, highly productive student that demands

change in the use of technology in the classroom (Oblinger & Oblinger, 2005; Palfrey & Gasser,

2010; Tapscott, 2008). However, the empirical evidence points to a generation of students

familiar with basic technology and yes, they use it often, but the evidence also depicts a

generation of students that are proficient in conventional technology, and have a limited

understanding of what tools to use to support their own learning. In addition, some still prefer

conventional, passive forms of learning and teaching (Margaryan et al., 2011). However, the

empirical studies cited for this study used first or second year undergraduates for the sample, not

students at the conclusion of their undergraduate education. It is unknown how much variation is

present in students' previous exposure to emerging technology for face-to-face and online

courses. Variables such as socio-economic status, home use of technology, access to computers,

and K-12 school district emphasis on technology could play a significant role in students'

perception about the significance of technology and how they use it when they enter the

academy. There is data to show what technology devices undergraduates actually use and value,

but not their expertise or how and why they use technology in the academic setting by the time

they approach graduation from a higher education institution.

What technology is important to students? Previous themes in the literature have

addressed the idea in popular media that this generation is a homogeneous group of technology

natives who use technology in similar ways. But what technology is important to digital native

students during their academic career at higher education institutions? It turns out that while they may own multiple devices to keep them connected to social media sites, text messaging, and email, most students value traditional computing devices for their academic success. In 2004, the Educause Center for Applied Research (ECAR) began surveying undergraduate students about their use of information technology. They have published an updated version of the report each year since and in late 2014 they released the latest data. The ECAR annual student technology study provides "A better understanding of how students use technology, which aspects of technology are important to them and to their studies, and which technologies they would like to see used more often" (Dahlstrom & Bichel, 2014, p. 7). Freshmen through Seniors, the current population of students in the academy were born in the mid-1990s; toddlers when the Internet browser was born and graduating high school when Facebook, YouTube, Twitter, and smartphones were being used by billions of people. But what technology do Digital Natives use once they arrive on campus and how does technology mediate their learning experience?

According to the 2014 report from ECAR, "Technology is embedded in students' lives, and students are generally inclined to use technology. However, technology has only a moderate influence on students' active involvement in particular courses or as a connector with other students and faculty" (Dahlstrom & Bichel, 2014, p. 8). ECAR reported that ninety percent of students own a laptop, 86% own a Smartphone and 47% own a tablet. From 2004 to 2012, there was an 87% increase in students who own a laptop (Dahlstrom & Bichel, 2014). What resources are important for Digital Natives to access from their mobile devices? It is a mix of administrative and academic communication tools, the top five most popular being communication with other students about class-matters outside of class, checking grades, searching for information during class, using the university learning management system, and

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accessing information about events, student activities, and organizations (Dahlstrom & Bichel, 2014). Similar to the ECAR survey results, Thompson (2013) concluded, "the range of technologies students use may be fairly limited" (p.24). Of the eight digital technologies explored in Thompson's study, only the groups referred to as Rapid Communication Technology (text messaging, Facebook comments, online chatting, voice calls on a cell phone, and using several technologies at once) and Web Resources (using the web to explore a topic, look up a fact, watch an online video, or listen to music) were used frequently by most students. This finding is another example of digital natives tendency towards fast, "get-in, get-out" web searches, access to online content, and a preference for inclusion of distance education characteristics in their courses, such as the blended learning course design.

As reported by Dahlstrom (2012), 74% of students say they have taken at least one class with online components and between 2008 and 2012 there was a 107% increase in the number of students that had taken at least one class completely online. Fifty-four percent say they are more actively involved in courses that use technology and three out of five students say it's important to have an online forum to communicate with other students. Surprisingly, in response to the survey question about how they wished faculty would communicate with them, 53% responded face-to-face interaction, and an equal percentage chose the course or learning management system. But not far down the list is text messaging at 43% and instant messaging/online chatting at 37%. Yet, communicating with instructors using instant messaging (iChat, Google Chat, Facebook) would require a connection outside the borders of institutional tools (LMS, Email) and only 29% of students wished their instructors communicated more using Facebook. So while more than half of students wished their instructors used more technology and say it's important

to have an online forum to communicate, their preference for a mode of communication is still up for debate and varies by learning context.

For the purposes of this study, it is important to take all of the previous research into consideration when trying to understand how Digital Native preferences for technology and uses of technology might play a role in the overall experience of the pre-service interns in the Big Lake City urban educators program. Equally important is to examine the success, failures, and experiences of other programs that employed information and communication technologies for pre-service teacher training.

Distance Education and Pre-service Teacher Training

Distance education is the parent term for the many alternative distance learning methods that have been created as technology has advanced mobility of students and delivery of courses; subsets of distance learning include e-learning, flipped learning, open learning, and distributed learning. Online and blended learning also fall under the umbrella term of distance education and various delivery methods of courses by different technology methods exist, such as video conferencing, satellite broadcast, course management systems, faculty managed websites, and mobile learning (Abdous & Yen, 2010). The steady growth of online education has changed the landscape of higher education institutions of all types. The number of students enrolled in at least one online course in 2012 was 7.1 million and online enrollment represents 33.5% of total enrollments at higher education institutions. Comparatively, in 2002, 9.6% of total enrollments were online enrollments and 1.6 millions students were enrolled in at least one online course. Between 2002 and 2012, the compound growth rate for online education was 16.1%, while overall, the higher education student body has grown at a much smaller 2.5% during this same time period (Allen & Seaman, 2013).

Blended learning, a mix of face-to-face and online components whereby a substantial

proportion of the content is delivered online (30-79%), has seen steady growth in recent years

and has been identified by the 2015 NMC Horizon Report as a current model driving educational

technology adoption in higher education in the next one to two years (Johnson, Adams Becker,

& Estrada, 2015). Penetration of blended learning in higher education has been steady, with 55%

of all institutions offering at least one blended course with 45.9% of all blended courses at the

undergraduate level (Allen et al., 2007). While online and blended learning is not viewed as a

replacement for traditional face-to-face courses, institutional leaders continually view it as a

strategic imperative. In 2014, 70.8% of institutions agreed that online education is critical to

their institution's long-term strategy (Allen, Seaman, Hill, & Poulin, 2015).

There is no doubt that the growth of distance education, such as online and blended

learning, has reshaped many disciplines in higher education, but what role has information and

communication technology played in pre-service teacher training? Teacher education programs

delivered with distance learning technology have included Interactive Television courses,

courses partially delivered on CD-ROM, blended (hybrid) courses, and online courses. While

there is a limited amount of research on distance education for adult learners (non-traditional) in

teacher education program, there is a paucity of research on distance education with Digital

Native pre-service teachers.

Before the boom years of the Internet and online learning, Interactive Television (ITV)

and videoconferencing were early alternatives to traditional face-to-face courses for teacher

education and could reach students unable to attend courses because of family commitments or

their distance from the main campus of their institution. While ITV and videoconferencing were

the only option for some students to enroll in required courses for their teacher education

program, early research reported that student appreciation for access was tempered by frustrations with technical hitches, time delays, and limits to their opportunities to engage with instructors (Gillies, 2008; Paulsen, Higgins, Peterson Miller, Strawser, & Boone, 1998). In addition, when videoconferencing connections were dropped and could not be recovered, students' confidence in technology was compromised. According to Gillies (2008), some students reported feeling as if they were not a "real" student and received less input from instructors, however the same students reported that the opportunity to have questions answered in real-time, similar to a face-to-face course, was a benefit of the videoconferencing format. Additionally, Gillies (2008) also noted that most respondents also referred to the benefit of participating in the small cohort at the remote site to build a close-knit, supportive atmosphere over the time span of the course. Lastly, students reported feeling most engaged and present in their courses when class content was interactive and not just a set of PowerPoint slides accompanied by an instructor monologue (Gillies, 2008; Paulsen et al., 1998).

Similar to early research on online teacher education courses that leveraged ITV or early videoconferencing technology, early research on pre-service teacher students that enrolled in online courses focused on adult learners (non-traditional students) with work and family responsibilities or distance challenges to pursue completion of a degree. Young and Lewis (2008) in a study of 92 pre-service teachers who were mostly adult learners at seven universities examined the perceptions of teacher candidates exposed to distance education courses, concluding, "pre-service teachers have a more or less positive response to distance education in terms of overall satisfaction and enjoyment" (p.608). They also concluded and emphasized the importance of distance education courses to teacher preparation programs as future teachers may

one day themselves "devise 'cutting edge' technology driven approaches to deliver courses" (2008, p. 608).

Blended learning alternately referred to as hybrid learning, has had more penetration in teacher preparation programs as a course delivery format than ITV, videoconferencing, or online learning. Unlike the other formats, blended learning courses combine face-to-face meetings with online components to facilitate course material, discussions, and activities. In a studies of Digital Natives and their use of online discussion boards for distance learning, online discussions were the "only online tool that undergraduates had used more extensively in their coursework (76.9%) than informally (52.9%)" (Kumar & VIgil, 2011, p. 144) and viewed as positive experiences for students and critical to their success in their course (B. Li, 2009). However, Brown (2008) reported that while students felt more comfortable in the online environment discussing uncomfortable or controversial topics, students "looked for other student to agree with and respectfully responded" (p. 164). Students in Brown's study also reported feeling more instructor authority in face-to-face sessions and felt the need to answer correctly, as opposed to the online discussions.

In addition to online discussion boards, blended learning courses incorporate other technology such as online videos, chat sessions, online office hours, and use of the university course management system for access to readings. In a study of 364 Digital Native pre-service teacher students taking blended learning courses, Foulger, Beardsley, and Toth (2011) found that "students were pleased with the hybrid components of the courses in which they were enrolled and expressed their belief that online components of their courses enhanced their learning" (p. 155). Similarly, Lin (2008) found that 60 percent of Digital Native students in blended instruction indicated that the format increased their interaction with the instructor and fellow

students, helping to build a learning community. This finding fits within one of three blended

learning areas of interest, *Communication Matters*, identified by Foulger et al. (2011) as critical

to the success of the blended learning format at the conclusion of their study on hybrid courses in

a teacher preparation program.

Communication Matters includes communication barriers to course success such as

unexplained course expectations, lack of technology training for students, or unorganized online

materials as potential complications to completing tasks to student satisfaction. Positive affects

of *Communications Matters* include interaction with peers and individualized attention from

instructors. The two other areas of interest identified by Foulger et al., *Access to Content is*

Critical and *The Role of Technology*, are also addressed in the literature on blended learning for

pre-service teacher education and serve as themes for the rest of this section on distance

education and pre-service teacher training.

Access to Content is Critical is reflected in student concerns about instructors that are ill-

prepared to teach online or lacked the technology skills to manage online activities. Conversely,

instructors "who embedded technology to the point that working online enhanced their

capabilities to learn" (p.158) are praised by students (Foulger et al., 2011). A common

misconception about blended (and online) courses is that the workload will be less than a

traditional face-to-face course. However, workloads can be heavier and requires learners to be

self-motivated and self-directed without the weekly face-to-face meetings to hold learners

accountable (Lin, 2008; Wang, 2009). Miscommunication about content and structure can also

lead to confusion about the process of blended instruction, especially at the beginning of a course

(Lin, 2008). The effectiveness of the blended learning format can also be dependent on students'

learning styles and their ability to adjust to a new course delivery format and the lack of or

diminished effect of non-verbal communication experiences in a face-to-face classroom (Wang, 2009). Wang (2009) states, "Online learning in teacher education is challenging due to the lack of personal appearance and real-time contact in online classes, possibility of unresponsive instructors, lack of social networking opportunities, possible technical difficulties, and lack of self-motivated, self-disciplined, and self-directed students" (p. 81). Technology is the linchpin that holds the blended format together between face-to-face meetings and the final area of interest identified by Foulger et al.

Foulger et al., related *The Role of Technology* to the technology skills of the instructors and how it affected student satisfaction, but they could not discern any pedagogical change by adding a layer of technology to the teaching and learning process. However, technology does play a role in other studies of blended learning courses for pre-service teachers. Students felt anxious about the new instructional approach in the first few weeks and when technical issues impeded student learning (Foulger et al., 2011; Lin, 2008). The computer skills required to succeed in the online component of a blended course also highlights the role of technology (Wang, 2009). Those that began the course deficient in computer skills could run into technology difficulties that "may add on to students' frustration and confusion during online classes" (Wang, 2009, p. 47). However, when asked to suggest improvements for the blended courses, Yang (2009) reported that students suggested new online technologies "such as chat rooms and video conferencing tools can facilitate more real-time interaction in online classes" (p. 48) to alleviate the lack of personal contact and real-time interaction in some online classes. The role of technology can be negative or part of the solution to issues within the blended course format. Overall, students believe that online and blended learning opportunities grow access to teacher education programs, can be as effective or more as face-to-face courses, and will continue grow

as a viable option for completing the requirement of a teacher education program (Brown, 2008; B. Li, 2009; Lin, 2008; Wang, 2009).

Summary

This literature review presents the ideology of the popular media about the technology knowledge and use by digital natives. However, empirical evidence shows that current college students (Digital Natives), while heavy users of basic technology for personal and academic use, vary in comfort level with advanced technology (Dahlstrom & Bichel, 2014). In addition, what knowledge students bring to distance education courses may not translate into a positive experience when presented with some of the challenges of online learning, blended learning or other distance technologies. Most of the current literature on Digital Natives in the higher education setting examines the experiences of first year college students and the research on distance mediated teacher education is limited. This review has established a gap in the research on Digital Natives as pre-service teacher education candidates and their ability to navigate a completely distant teacher education internship experience in a unique format that combines elements of blended learning and virtual face-to-face meetings using video technology.

<center>**Chapter Three: Research Design**</center>

This chapter discusses my choice of qualitative research design for this dissertation and the use of the case study approach. In addition, I describe the methods of data collection guided by the single case study design framework. In the final section of this chapter the data analysis and validity procedures are discussed.

Qualitative Research Design

According to Maxwell (2005), qualitative research design "is an ongoing process that involves 'tacking' back and forth between the different components of the design, assessing the implications of the goals, theories, research questions, methods, and validity threats for one another" (p.3). Qualitative researchers "are interested in understanding how people interpret their experiences, how they construct their worlds, and what meaning they attribute to their experiences" (Merriam, 2009, p. 5). Using the guidance of both Maxwell and Merriam, I chose to design and complete this dissertation following the guidelines of qualitative research, which gave me the flexibility for deep dives into the experiences of the pre-service teaching interns through the case study approach.

A case study "investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, p. 13). In this case study, I deliberately wanted to study the experiences of the Digital Native pre-service teachers within the boundaries of a unique distance education program that resides within the greater context of a highly ranked teacher education program. Would their previous experiences with technology in personal and educational settings affect their experiences with distance education when they had no other option but to rely on communication and information technology for participation and collaboration with instructors and peers at

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Midwest State University? The single case study approach is represented by the unique learning context of the teaching interns.

This case study resides within the broader context of teacher preparation and distance education. In that sense, it is a study bounded by one urban education cohort of Digital Native pre-service teaching interns taking graduate level methods and content knowledge courses via distance education technologies. The focus is on investigating their experience with technology before entering their internship year and how they navigate through the learning context when they have to use technology for course participation and collaboration through instructional and communication technologies during two consecutive semesters. This research is a holistic single-case design focused on a single unit of analysis, the Digital Native pre-service teaching interns (Yin, 2009, p. 46). Similar to other methods of qualitative research the case study requires that the researcher gather information in the "natural setting" of the participants and collect "multiple sources of data", such as interviews, observations, and documents (Creswell, 2009; Miles & Huberman, 1994; Stake, 2005; Yin, 2009). For this case study, interviews and observations were utilized for data collection and to interpret the participants' meanings.

Participants and Selection Procedure

The purpose of this study was to investigate a small cohort of digital native pre-service teaching interns to explore their experience with technology before entering their internship year and how they navigated through the learning context when they had to use technology for course participation and collaboration through instructional and communication technologies. Research participants were chosen out of the pool of interns participating in the Big Lake City urban education cohort using purposeful convenience sampling, described by Merriam as sampling "based on the assumption that the investigator wants to discover, understand, and gain insight

and therefore must select a sample from which the most can be learned" (Merriam, 2009, p. 77).

Otherwise known as non-probablistic sampling, or purposive (Miles & Huberman, 1994), the first step to begin purposive sampling is to determine the selection criteria that are critical and essential in picking the people or locations to be studied (Merriam, 2009). Criteria for selecting the participants in this study was done with the intent of picking a sample from two of the disciplines (secondary education and special education) represented in the cohort since the distance education technology and format for both groups were nearly identical. I used two criteria for picking the select the participants: (a) all participants were either secondary education or special education interns completing their fifth-year teaching internship in the Big Lake City cohorts; (b) all participants, based on their age, were considered Digital Natives. Interns were contacted via email to initialize contact about participating in the study using sample email protocols provided by the Midwest State University Committee on Research Involving Human Subjects (UCHRIS). Once the subjects agreed to participate in the research, another email was sent verifying the description of the study, the interview process and scheduling procedure, and providing them with an informed consent form created under the guidelines of UCHRIS. In consideration of ethical issues, face-to-face interviews were cognizant of the impact on the participants' time and I minimized the disturbance on their daily routines by traveling to Big Lake City to meet with them in coffee shops close to their homes or at their school placement.

Data Collection

  Interviews. I traveled to Big Lake City, conducing five semi-structured face-to-face interviews using open-ended questions. In addition, two interviews, generated from suggestions by the two of the original five interviewees, were completed using the telephone because the participants could not meet with me when I was in Big Lake City. Generation of additional

interview subjects is common in qualitative research; samples are often not prespecified and evolved throughout the data collection process (Miles & Huberman, 1994). Interviews were an essential source of data collection for this study to help me understand the interns past experiences with technology for academics, in their home lives, and during the internship year.

Following the guidelines from Merriam (2009), I created an interview protocol with "a mix of more and less structured interview questions" to obtain specific information from each participant (p.89). Guided by the case study approach, I was able to design an interview protocol with "how" and "why" questions of substance and form (Yin, 2009). The protocol started with two structured questions to record demographic data about the participants' age and year of high school graduation (Appendix A). The questions that followed comprised the largest part of the interview, divided into two areas of interest related to the research questions of this dissertation: Student technology background and reflections on the internship year. As per Yin (2003) and Creswell (2009), the protocol served as a guide for the interviews, rather than a structured query to allow for subquestions to arise throughout the process to probe for further detail and explanation. Interviews included questions about experience with technology throughout their academic careers and settings, personal backgrounds and identification with the Digital Native idea, self-measurement of technical abilities entering into internship year, and self-measurement of ability to learn and communicate with technology during the internship year. While questions in the protocol were listed in a numerical order, they merely served as a guide to the inquiry, not meant to be asked in any order determined ahead of time (Merriam, 2009; Yin, 2009).

Pilot testing. To determine the efficacy of my interview protocol, pilot interviews were conducted before traveling to Big Lake City with three Digital Native pre-service teachers. Participants provided me with feedback on which questions were confusing, leading, or needed

rewording. The results of the pilot testing also gave me insight into which questions would yield useless data. I adjusted my interview protocol and proceeded to use it with the selected participants.

Conducting Interviews. Interviews were digitally recorded to MP3 audio files on a portable audio recorder and verbatim transcription was completed at a later date and time. Notes were taken during the interviews and later compared with the finished transcriptions. The interview transcripts were set up to enable analysis with identifying information at the top of the page as to where and whom the interview was conducted (Merriam, 2009). Line numbering was included on the left-hand side of the page to aide in coding during analysis and identifying pertinent quotations to be used in the data interpretation. Before reading through any of the transcripts, I listened to the recordings to create some initial thoughts and notations about possible themes and categories. During an initial read through each transcript, I used open coding to jot down comments in the margins that struck me a potentially useful. I repeated this process for each transcript. Once transcription was completed, the recorded audio files were listened to while reading through the transcripts to generate initial themes, thoughts, and interpretations across all seven interviews.

Observations. Observations of two full days of distance education technology facilitated coursework at the high school used for the video technology mediated coursework were completed during trips to Big Lake City for the interviews. The high school, set in the southern districts of Big Lake City, had an institutional aura about it, affecting the setting and comfort of each class meeting during the teaching internship year (Appendix B). Similar to other methods of qualitative research the case study requires that the researcher gather information in the "natural setting" of the participants and collect "multiple sources of data", such as interviews,

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observations, and documents (Creswell, 2009). For this case study, interviews and observations were utilized for data collection and to interpret the participants' meanings. As noted by Merriam (2009), "Observation makes it possible to record behavior as it is happening" (p. 119). Observing the teaching interns in the distance education setting allowed me to see first hand their interaction with the technology in use in the context of participation and collaboration through distance education technology.

The protocol for observational data included multiple pages with a dividing line down the middle of each page to separate descriptive and reflective notes, or the "see" and "feel" notations (Creswell, 2009). Descriptive notes included details about the physical setting, the participants, their activities and interactions, conversations, and other subtle factors such as nonverbal communications or unplanned activities (Merriam, 2009). As a participant observer, descriptive notes were also included about my own behavior and comments to the participants. At least twice, I had to step out of my observer role and help with the video conferencing equipment. Reflective notes, such as my speculations, feelings, insights, and lightbulb-moments were included throughout the observational data. For every five minutes of observation, the time was divided into four minutes of taking notes and one minute of just observing the overall picture in front of me. Guiding my observation sessions was the intention to continually shift from the wide angle to narrow angle lens, focusing on specific people for periods of time and then shift back to the entire group. As noted by Merriam (2009), "Participant observation is a schizophrenic activity in that the researcher usually participates but not to the extent of becoming totally absorbed in the activity" (p. 126). This was certainly the case for this study as I was more of a "fly on the wall" than active participant during the distance education video conferencing course meetings.

Upon completion of both observation sessions, highly descriptive field notes were immediately composed with enough detail so that any reader would "feel as if they are there, seeing what the observer sees" (Merriam, 2009, p. 130). Detailed descriptions of the physical setting and the teaching interns were composed, in addition to highly specific details of the activities and behaviors of the interns during the video conferencing sessions. Observational data served as key triangulation cross-reference data to the analysis and themes produced from the interviews. Reflective notes written up into prose as part of the field notes were compared with initial reflections created when I listened to the interview audio files while reading through the transcripts for the first time (Miles & Huberman, 1994). Similarities were noted at the end of the field notes and included as part of the continuous data analysis for theme throughout the research (Creswell, 2009; Merriam, 2009).

Data Analysis. Data analysis was ongoing both in and out of the field of study. Merriam (2009) states, "Without ongoing analysis, the data can be unfocused, repetitious, and overwhelming in the sheer volume of material that needs to be processed. Data that have been analyzed while being collected are both parsimonious and illuminating" (Merriam, 2009, p. 171). Analysis is also iterative, therefore after completing notations on each transcript of initial themes using open coding, I organized the transcripts into draft versions of descriptive accounts, interpreting what the interns had said as part of the process of meaning making. The draft versions were then examined to identify see if the same themes emerged. The goal of this part of the data analysis was to identify segments in my data there were responsive to my research questions (Merriam, 2009). Once themes were identified and compared to the initial themes, they were grouped into categories. As each category was identified, file folders on my computer were created and each unit of data from the interviews or observation field notes that corresponded to

that category was put into the folder (Merriam, 2009). Each unit of data was marked to note the participant's pseudonym, line numbers from the transcript, or page of the field notes or memo.

Moving to my next set of data, observation field notes, I scanned them the same way as the interview data; an initial read through to identify themes not long after the completion of the observations, followed by further examination later on in data analysis. Themes were consolidated into categories and then cross-referenced to categories created during the interview analysis. Similar categories were combined and associated units of data were read through again to be sure they were sensitive to the data, exhaustive, mutually exclusive, and conceptually congruent (Merriam, 2009).

A qualitative case study facilitates "the conveying of experience of actors and stakeholders as well as the experience of studying the case" (Stake, 2005, p. 454). The descriptions of the Digital Native pre-service teaching interns experience with technology before entering their internship year and how they navigated through the learning context when they had to use technology for course participation and collaboration were composed not only as part of the data analysis, but to convey contextual accounts for readers in the construction of knowledge of the case. As such, after the category creation was completed, each descriptive draft of the transcripts were reread, compared with interview notes, digital recordings, and rewritten to tell the stories of each intern, careful to let the content evolve even in the last phases of writing (Stake, 2005).

Summary

For this single case study, I conducted interviews with seven teaching interns in the College of Education at Midwest State University and two days of observations of the

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synchronous videoconference technology distance education courses between Big Lake City and the campus of Midwest State University. After each day of observation, I promptly completed highly descriptive field notes based on the separate descriptive and reflective notes, or the "see" and "feel" notations. Five semi-structured face-to-face interviews were completed using open-ended questions. In addition, two interviews were completed using the telephone because the participants could not meet with me when I was in Big Lake City. Interviews were an essential source of data collection for this study to help me understand the interns past experiences with technology for academics, in their home lives, and during the internship year. In the following chapter, I describe the technology stories of seven teaching interns during their early education, adolescent, and high school years and how that experience influenced their experience during their teaching internship in a distance education program.

Chapter Four: Student Experiences

In this chapter I tell the stories of the technology background of the pre-service teaching interns during their early education and university years and their experience with technology during the internship year and what the interns learned about themselves and their relationship with technology. In addition, observational data from two full days at the high school in Big Lake City is summarized from field notes. The purpose of this study was to investigate a small cohort of pre-service teaching interns in the Big Lake City teaching internship program to explore their experience with technology before entering the internship year and how they participate and collaborate in the learning context of distance education courses about teaching practice. Subject matter taught via distance education during the internship year includes teaching practice and methodology, relationships of teachers to colleagues and parents, unit planning, and curriculum planning.

The Story of William

Background and History. William was a 24-year-old African-American who grew up in Detroit, Michigan in a single parent home, graduating from Detroit Public Schools in 2008. He was tall, lanky, and articulated his thoughts with his hands, moving them in the air to accentuate his thoughts. Before each answer he paused to gather his thoughts and then launched into a rapid, but not inaudible response. When we began to explore his childhood, he explained that technology was absent from his home until he entered high school, when his family got their first desktop computer and soon after, an Internet connection so he and his siblings could do their homework. Living in a single parent home, money was tight, therefore prior to getting a home computer, William and his sibling would stay after school to use computers made available to them by the school district as part of an after school technology program for low income kids.

When I pressed William to think about his exposure to technology at school, he though for a minute or two, then recalled that during his elementary education, he had some computer classes, though not many and not with any consistency. When he transitioned to middle school and high school some class time was spent in labs with PCs and he explained that all his classrooms all had at least one computer, but it had to be shared by every student.

When he and his siblings got into high school, their Mom bought flip-style cell phones for each of them. William laughed when he recalled that they used them extensively for texting each other and their friends because it was such a new technology to them, giving them a way to instantly communicate like never before. As a consequence of only having one computer at home that had to be shared by everyone in the household, William and his siblings used their cell phones to surf the web for personal needs and for research projects for school assignments. When asked about technology use by his siblings, William chuckled a bit before describing his brother as "tech savvy," knowing all the terminology, how to fix many kinds of technology, and how to use it. "He uses the computer to research how different parts and what they are called and used so he knows about all this stuff," William proudly talked about his brother. Conversely William considered himself a marginally technology literate person; knowing enough to find what he needed online, send text messages and perform basic functions on his cell phone and on their PC. Unlike his brother, his sister knew how to do basic tasks like surfing the Internet, use her cell phone and that was about it. William described his mother as "still kinda in the dark ages" where technology skills were concerned. No need to know anything more than dialing a phone number on her cell phone. Finally, he laughed as he spoke about his grandmother, also a part of his family, "She of course doesn't know how to do anything – texting, using the cell phone, nothing. She's completely stuck in like 1940."

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When I asked William if his mother's low level of technology use was typical among the parents of his friends, he shifted in his seat a bit, but quickly replied yes and explained that many could not afford to buy home computers and by the time they could buy it, their children were using the computers for school projects, leaving little time and resources for them to learn how to use the computer. William found himself with a keen interest in technology as he progressed through high school and started to play around with technology more and more and as time went by and he was exposed to more of it he wanted to learn more.

Although he felt that his technology skills and knowledge were not the best compared to some of his peers in college, William enthusiastically spoke about his later years of high school, telling me how each new cell phone upgrade led to technology doors opening up for him because he could use his phone to do Google searches for school, watch YouTube videos to learn how to do various tasks or for entertainment purposes. If he couldn't figure out how to do a task on his own, he'd ask more experienced friends and learn from watching them model the task on their technology devices. Many of his friends were also self-taught when it came to technology, so they helped each other along the way to better their technology knowledge. William proudly shared with me this experience with his high school friends when he reflected on whether or not he considered himself a Digital Native, "I don't think I've gotten like training specifically on terminology like I probably should have but I do know how to use it. I know some things, I can fix little, small things with technology but I don't know exactly what the parts are. I just know through watching and picking with things, how to repair and how to use it." For example, William said that unlike one of his really close friends, he didn't know what the term gigabyte meant or how it related to computer memory. He just knew how to use computers to accomplish certain tasks, like email or an assignment in Microsoft Word. He was continually evolving in his

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practice, especially when it came to using technology for coursework and seeing how he could use technology to help himself teach during his internship year and help future student learn.

During his freshmen year of college, William relied heavily on the first laptop that he purchased, a PC by Compaq, for taking notes in class, doing online research for papers, and completing assignments. Texting continued to be a large part of his technology use, which he made a point to emphasize by using his hands to gesture a large object in the air while saying, "Lots of texting. Texting was heavily used freshman year." For stress relief from coursework and part-time jobs, he and his roommate played video games on a shared Sony Playstation2 at least three times a week. He paused at this point, searching his thoughts and continued on about stress relief, working on homework and how he would listen to music on his Apple iPod all the time in between classes and while working on assignments. Music through his iPod was his constant technology, day or night.

By his senior year, William replaced his Compaq PC with a MacBook Pro from Apple and upgraded his flip-style cell phone to an iPhone 5C. Once he got the iPhone, his digital still camera that he purchased earlier in his college career got very little use, as the camera on the iPhone became the main resource for taking pictures and videos. William explained that because his MacBook Pro, iPod and iPhone all worked seamlessly together, he started to expand his technology skills and learn how to create videos with his friends. In the beginning, the videos were strictly for pleasure and entertainment purposes, but he later found himself using that self-taught experience to create videos for classes and teach other students how to do it for themselves. "So usually I learn what my friends do, they'll teach me and we all learn together. Then I directly use it in my classes as well, what I did use when I was in class," William recalled. He continued on, very excited and proud, "I do have, again, a YouTube page and I use

my iMovies and put my movies on YouTube…I also have a Socialcam account and I do different speaking clips, usually months, every month or so and also post it as well. So once I knew how to do it, then I started doing it a lot more." Talking with his hands again, first close together, almost palm to palm and ending up far apart, William finished his thoughts, "It feels native now. In the beginning it wasn't so much native but now I know how the process works. It'd take me weeks and weeks and weeks, almost a month to get my first video where it needed to be. Now I take about a couple of days and I'm finished with it." Our conversation then turned to talking about how technology shaped his study habits.

Multitasking with technology became a daily part of his routine for personal tasks and academic work. He would often use his cell phone to text while working on several different tasks on his laptop, like an assignment in Microsoft Word, or surfing the Internet or doing research for a report. He might also listen to music on his iPod or through iTunes while using an application that he needed for his schoolwork. Since William didn't have a scanner, he was creative with the use of his cell phone and would take a picture of a document that he needed for an assignment, then emailed it to himself for use in his studies. He elaborated on this explaining, "So I went onto my application on my phone, looked up scanner, free scanner and there was one and I used that and then got my project done." This particular use of his cell phone as a scanner was just one example of how William's use of technology changed over the course of his time at Midwest State University. He expressed and felt very strongly that he had evolved from a novice to experienced technology user during his undergraduate education. Some of his growth in his technology ability was in part to his own exploration with creating videos using iMovie on his MacBook Pro during his senior year and some of it he attributed to his classes that incorporated technology into the coursework.

While reflecting about his digital literacy and the impact of technology on his

undergraduate education, William expressed:

I've come a long way from my freshman year and also when I was younger as far as, you

know, knowing what it is and how to use it. And also learning every day cuz everything

changes all the time. But now I find myself teaching other people who don't have any

literacy, how to use it and what it is as well.

By the time he arrived at the start of his teaching internship year, William saw how he could

push himself to use technology in more contexts and help the students in his placement learn as

well.

Internship Experience. William began the teaching internship year feeling very

comfortable with a distance learning setting, expecting the distance technology mediated class

sessions to look and feel like his previous experiences with Skype, although he had no

experience using a Polycom videoconferencing system. He spoke confidently that the setting

didn't feel as "distant" as he expected it to be; all he had to do to feel included was to speak up

more, make his presence felt to participate, and insert his voice in the conversations to not be left

behind. He found himself challenging a peer comment on the other end of the connection with an

"Excuse me, I have comment" to make his participation possible through the video conferencing

technology. One of the advantages of this technology, William commented, is that students can

take more classes without having to be physically in a classroom, "The benefit is that you can

have more classes, like sometimes maybe one day in the course, you're at home. You don't need

to go to the classroom. You can do it in your bedroom or do it sitting in the library, something

like that." However, he was quick to point out a disadvantage as well, "You always miss out on

that personal touch and that personal interaction with people when you are in the actual physical

presence. It's a little bit different when you are far away and not really, you can't really look in their eyes and the human interaction is not really there because you can't, you can't be there in the actual presence so that's the one drawback." Although William felt that the experience didn't have that distant feeling as he expected it to be, this comment about a lack of personal touch and human interaction was telling about what he thought about distance technology enabled learning.

When I asked William to reflect on his own definition of learning with technology he compared the experience to any other learning context; the difference being that he learns through the technology instead of another classroom tool, like a book, lecture, or journal article. He knew he was learning when he was taught by an expert, like a faculty member, and then was able to do it himself: he knew what the concept was, knew how to use it, and then he was able to teach it to someone else. In an idealized classroom setting, he had high expectations for collaboration and the ability to move around to different spots in the room. Add in technology and the collaboration should be enabled and hands on. He paused, collected his thoughts, and articulated, "I want to see more technology content, you know, interconnectedness more in my ideal classroom or college classroom." As he shifted his thoughts to the internship year, the interconnectedness of the face-to-face classroom that he felt so strongly about was accomplished through Skype meetings with his instructors using his laptop or the Skype app on his phone. In addition, he collaborated on assignments with the peers in his Big Lake City cohort using Google Drive. During the Friday distance technology mediated class sessions William used Google to multitask to fact check comments by his peers and garner more information to add to the conversations. However when it came to participating in the conversations over videoconferencing, he spoke slowly and shared his thoughts about how some conversations didn't evolve over videoconferencing.

In William's view:

Cuz I'm not there, it's kind of like I feel a little bit uncomfortable taking conversations where they want to take them without being in person to do it. Kinda seems impersonal to sometimes challenge sometimes certain things when you're not there in person, challenge them.

At times, there was a feeling that the professor forgot about the interns in Big Lake City. William and the other interns felt unnoticed and it made it easier to just sit there and not even partake in conversations. "I was more quiet. I think I was, it depended on the conversation. There was some stuff I was definitely more vocal with cuz the topic interested me and I definitely wanted to insert my input and there was some things that, because I wasn't in class, I was able to not say anything," he described, "We were able to just not participate. Sit there, go on Facebook, YouTube, have a conversation here and there, maybe get up and leave and go to the bathroom or walk the hallways…we were able to things that would not have been done if you were in the classroom." Despite this lack of participation at times, William insisted that it did not affect his overall internship experience through technology.

One of the benefits of the Polycom videoconferencing technology was the ability to bridge the distance between the two sites by using the remote control to zoom the camera in and out to see people's faces in Middleville. Another benefit (and detriment when they wanted to not participate) was the ability to mute the microphone to have uninterrupted conversations about class topics or work on group work. William quickly pointed out to me that his experience with the video and audio technology was positive, "I think it was great. I heard clearly and I saw clearly so to me, I thought it worked phenomenally well." As for how distance learning worked or did not work for teacher preparation during the important teaching internship year, William

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again reiterated his thoughts about the lack of certain aspects of in-person conversation and engagement. Although the overall internship journey was great and the various types of technology, like Skype, Polycom, and Google Drive, made interaction available, he reflected that interns in the distance education context might not be as vocal, talkative, or engaged in conversations with the professors who teach the courses. And that type of experience might stop them from growing and getting the guidance they need to be educators. However, eliminating the videoconferencing technology and making the intern classes completely online would not have been agreeable to William because the video technology enabled opportunities to talk to the professors on a regular basis, see their faces, and be included in classes, "Even though it's still distance, I still spoke with them and talked with them, and online, you get none of that. It's all just, it just doesn't feel as personal. I think you can learn a lot better when you know the person that is teaching you and they try to build a relationship with you."

The Story of James

      Background and History. James was a 23-year-old Caucasian male, with dark hair and a slight build, who grew up in the affluent suburbs of Big Lake City, graduating from high school in 2009. He grew up with enormous exposure to technology, both at home and in his K-12 schools. When asked about the amount of technology in the K-12 schools he attended, he vividly recalled having access to a computer lab from the time he was in kindergarten and having at least one computer in every classroom throughout his time in school. In high school there was at a minimum, one laptop cart to be used by individual classes throughout the school, two computer labs for students to use and most classrooms had a projector screen and televisions. Most important to James was that he had the opportunity to use a MacBook Pro laptop for his journalism classes as part of the staff for the school newspaper. He excitedly explained that that

experience was important for him, "The big thing with my K-12 education was my journalism program had some really fancy MacBooks, so I extensively used those within a classroom setting. Not only for my journalism class but also for the school newspaper. So we were well resourced in that capacity." At home, James was also well resourced in technology.

James had a personal computer from the time he could remember and both his parents had laptops and cell phones for work. His mother, a corporate travel agent, had to use technology for the responsibilities of her position, so James considered her to be very technologically savvy. Similar to his mother, James' father needed to know how to use a laptop and cell phone for work, and was comfortable doing so, but was not as savvy as his mother. James described his parent's use of technology and comfort level as very typical of most of the parents of his friends, "Extremely normal for my group of friends. Yeah, I grew up in Palty, so more of a wealthy, affluent area that people generally were in service, or were in white collar jobs that use technology." James attributed his comfort with technology to his parent's ability to purchase computers or other technology for their home, making access easy.

A gaming system was a presence in his life from early on, starting with a Nintendo system and upgrading as each new system came out, all the way up to a Sony Playstation 3 at the end of high school. James got his first cell phone, a flip phone with basic functions, when he was in 6th grade. Because of the plethora of exposure to technology, he felt pretty comfortable with learning and using technology devices. He confidently explained to me that he was, "Very comfortable, in that if I got a phone, being able to figure out all its functions…same thing with computers, as well as whatever gaming system it was, TV especially. It's amazing how much the learning to work the TV Guide is a form of digital literacy as well." James carried this confidence with him into college.

When James arrived at the university, using his new MacBook Pro for taking notes in class came natural to him because of his previous experience. He quickly explained, "Well, I used my computer for taking notes. For assignments in class. Internet browsing. Social media. That was a very large part of my freshman year experience was starting to use that more in a classroom setting. Automatically that was where I was gonna take notes, that was going to be how I was going to store all my information was on my computer." In addition, he already knew that he would use his laptop to read articles for classes, check email, and interact on Facebook. Further on in his undergraduate experience he used his laptop to complete five online classes during the summer semester after his freshmen, sophomore, and junior years and during the fall semester of his junior year. One of his online course included audio lectures, which James really liked as a component because he could take notes along with the audio and it made him feel like he got the same experience out of the online class as he would have had it been a face-to-face class. As he progressed through his undergraduate education, James began to use his laptop more extensively for writing research papers, conducting in-depth research for methods classes, and multitasking between those two tasks by listening to music and keeping track of other events via multiple browser windows.

In fact, James reported:

I mean, my desktop in general is always technically multitasking because I'll have like how many ever browsers up, how many ever pieces of paper, PowerPoints. My laptop is generally a mess because I'm trying to do so many different tasks at one point. So the computer allows me to do that because I don't need to exit out of everything but it actually creates more clutter for me than anything.

Once James upgraded from his flip phone to a Smartphone and he purchased an iPad, those technology tools became the main sources for quick information searches, social media, and watching videos for entertainment or coursework.

Most of James' online activity as a creator of content was driven by his academic requirements and not by a need to create media for him or with friends. He created a wiki for a class by mimicking what he had observed after using Wikipedia for research. Without scaffolding or watching tutorials, he was able to "figure out how to space things out, how to play with the different lines and make it look like a Wikipedia page…and be able to use it in an effective way." For his online classes, he would do only what was required of him in online discussions, including posting comments to the teacher or commenting on student blogs. James shifted in his seat a bit, paused and said, "I'm a person that participates in a classroom when I'm in a classroom but online, it didn't transfer over as much for me." Outside of classes, James was a consumer of media far more than contributing new content to sites; reading and browsing Facebook, Twitter, and Instagram, and sports message boards were a regular activity, but James sheepishly explained, "My friends are probably more involved in social media, as far as posting on social media than I am. I follow social media but I don't use Instagram as much as my other friends but I would say that we haven't yet hit the point of, okay, people are blogging about everything and creating something out there, a digital presence. I don't think everything I have to say is that important." But James confidently stated that his lack of participation in content creation on social media did not affect his digital literacy for academic or personal pursuits.

As I explored the idea of Digital Literacy with him later in our interview, James strongly asserted that he was digitally literate, able to use the Internet as his main research source, understanding how to identify a proper source and the meanings that media creates.

James explained:

I feel like I'm very good at identifying good sources, identifying what is a proper source,

what is, what's really being fed to you by the media because I mean, as a history major,

as an education major, as a psychology major, or psychology minor, that's one of those

things that you're talking about it in your classes constantly and I was a journalism major

to start off so I feel like the understanding of what media is and what is being given to

me, I feel like I have a very high understanding of that.

Despite all the access and experience with computers and other technology growing up, James reacted apprehensively to the digital native description, saying that it "almost" fit his perception of himself. He saw himself and his generation as evolving with technology as part of their life. They grew up while technology like the Internet, grew at the same time. He spoke confidently, saying, "I think high speed Internet is the biggest thing that changed things and that wasn't fully in play until I was about in 6th grade, so I remember dial-up and I remember the progression of starting to use technology in the classroom, like the old school Oregon Trail. And then I remember how that changed. Like oh, wow, that's awesome to be able to see, new way of seeing things." James continued on that technology wasn't necessarily something he expected in the classroom as an adolescent, so when a teacher used technology it was a cool thing. Today's generation, he pondered, is more native because things like high speed Internet are just assumed to be available. Wireless *should* be everywhere. Whereas with his generation, they experienced the growth of technology and its growing pains at the same time as that they grew up.

Internship Experience. James came into the internship year with an expectation that the videoconferencing technology used to connect him and his classmates to their faculty and peers would work much the same as Skype video, which he had been using to communicate with his

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fiancé over the last year. He also expected to be moderately comfortable with the format since his mother worked from home a substantial amount during his childhood and she often used phone conferencing as part of her job. He felt he had a good understanding of the context of distance communication such as not being in the same room with others and still collaborating to accomplish something. This familiarity with distance video technology and audio conferencing gave him a higher comfort level compared to his peers and he ended up being the "go to" guy when there was troubleshooting with the connection or if the video conferencing equipment needed to be set up. James would also exchange text messages with me, the technology director at the College of Education, when he needed help troubleshooting or communicating a problem midway through a class period. By the time I conducted the interview for this research, we had developed a familiar working relationship.

Throughout the teaching internship year James felt he had to adjust from his familiar format of one-on-one communication with his fiancé over videoconferencing technology to participating in the seminar format of the classes. His previous experiences with online classes were outside of the College of Education and he could breeze through the semester by just consuming the course content, doing the minimum of work in discussion forums or not even being required to discuss topics with classmates through a forum. He felt like there was much more group discussion as part of the learning process in his education classes and participating via online discussion boards or through the videoconferencing experience was awkward. The built in one to two second delays of responses native to videoconferencing technology introduced a level of adjustment he hadn't had to make in other distance technology driven learning contexts. James didn't let that adjustment faze him and during the social studies courses with the lead faculty member and peers at Midwest State University, James would take the lead during small group

work with his Big Lake City intern peers, sharing their thoughts or results of group work with the class. It's not that his classmates in Big Lake City wouldn't participate, but in James' recollection they did not participate to the extent that he did. Although, he readily admitted that his participation amount definitely decreased in this distance education format, "Normally I jump right into a conversation, be one of the first couple people talking. It actually felt weird to be maybe one of the last people talking or not talk at all in a lot of the conversations because there's an awkwardness of not really being able to feel the room and understanding someone's trying to jump in here." The same awkward feel applied to the idea of doing group work through videoconferencing.

When asked about any opportunities to do small group work with the other students in Middleville through the Polycom, James was adamant that that would have been distracting and not worked well. It was much easier for the four interns in Big Lake City to be their own group. But he also admitted that it was "weird…not being able to see feedback from the other side. Just the human, natural human emotion of feedback was missing…" He continued, speaking thoughtfully about his participation overall during the year, "So it definitely decreased my participation because you felt like you had to kind of more watch what you were gonna say and have it be perfect…I like being able to participate in class." That said, James admitted that he used the barrier of distance from his faculty and peers to not participate.

James argued:

There was definitely the feeling of, there's times where I've gone into classes and not wanted to participate just cuz I'm tired from a day but there are definitely times when you could, you could totally just sit there. Be able to be on websites. Be able to maybe get

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work done for your classroom because you know there's not a teacher monitoring you.

You know exactly what the teacher is able to see.

There were many times he'd use the class time to catch up on work for his student teaching assignments or surf the Internet. Admitting this aloud made him wish he had not participated in that behavior, but nonetheless he did and took advantage of the moment and lack of faculty presence.

Another technology, Google Drive, was used during the internship year to enable collaboration between James and a peer in Middleville for an assignment and in addition collaboration with his cohort in Big Lake City for a couple of assignments. Even though they saw each other periodically for classes, each intern in the cohort was overstretched and lacked time to meet face-to-face in between class meetings, so tools like Google Drive provided a means for collaborating. In addition to Google Drive, James used email to send a Microsoft Word document back and forth with his peer in Middlevillle during the last stages of their project together.

Skype was used to meet with his faculty for feedback about the internship experience thoughout the year. When asked about how he knew he was learning with technology as a tool or medium, he quickly answered that it didn't matter what context it has been presented in, when his ideas are being challenged he knew he was learning. Thinking about the distance technology during the internship year and building on his thoughts about classroom technology, James reflected that the experience made him realize that if he would use videoconferencing in his future classroom for guest speakers, "there's definitely a factor that makes it not the same as having someone live." But the experience

during the internship year would prepare him for what to expect from the technology and mode of communication.

And so as we wrapped up our interview and he reflected on the entire internship year, James spoke slowly about how the distance and the technology shaped the year. "I don't think it really did that much to negatively affect it, " he said, "there was a little bit of a barrier but I feel like I still got out of my Friday classes almost everything that I would've gotten had I been in a Midwest State classroom…the main parts of the internship were the actual being in the classroom, stuff like that." Overall, the technology met his expectations and he was able to get something out of his class time; he knew at the beginning of the year that there would be a difference. He reflected, "I felt like when I was sitting in class, I was able to get something out of it. When it was just listening in on a conversation, I was able to take notes, was able to grab something out of it. I don't, I don't think I expected much more than that. I didn't expect a one on one personal conversation. I knew going into it that there would be a difference in being in Big Lake City." And even though at times early in the academic year the group missed parts of class because of network issues, once those problems were solved the technology even exceeded his expectations. Learning via videoconferencing was better than canned recordings and completely online modules with no live interaction with peers and faculty.

The Story of Spencer

    Background and History. Spencer was a 23-year-old African American male who graduated from a suburban high school in 2009, growing up in a two-income household. He was a well spoken, articulate young man who was confident in each response and passionate about teaching as his career path. We met up for the interview in the classroom of his mentor teacher which happened to be in the same high school that hosted the distance education classes. Spencer

made himself comfortable in one of the student desks and I settled into the desk across from him. As we began the interview, his mentor teacher entered the room and made himself inconspicuous, grading papers at his desk.

During the first part of the interview, we explored his early exposure to technology. Spencer searched his memory and recalled that he was exposed to computers from an early age, remembering his father and mother purchasing a large, boxy, Apple computer so his father could complete work tasks at home. His father traveled often for work, so when he wasn't on the road or in the office, he would spend considerable time working on the computer logging data. Spencer referred to his father as "whiz" when it came to computers. The family purchased a second computer for his mother, a teacher, much later in his childhood and that served as the computer for his schoolwork and other tasks. In contrast to his father, his mother was very resistant to learning to use computers, and only did so because she was required for her teaching position, thus Spencer described her skills as "basic". He elaborated on this description saying, "My mom went through college never really using a computer, and using a computer in her later years as a teacher is something that was difficult for her…she's never really been a fan of being with the technology." Compared to parents of his friends, Spencer described his parents use of technology as fairly typical.

Similar to his home exposure to technology, in his K-12 schools Spencer had access to technology, including computers, from early grades all the way through 12th grade. He paused and recalled, "From first grade on we had computers. I think when I got into high school that's when my high school started to have Smartboards and Smartboard tools that people could use from handheld devices." The focus of computer exposure in early grades was for school children to learn typing skills by playing games or performing drills. In later grades when access to the

Internet became available at school, he would use computers to work on research papers or assigned web quests in a particular subject matter. Spencer expressed that his exposure to technology in school, although typical for his friends who also attended suburban school districts, was not typical for the friends he had who resided in an urban setting. Most of those friends, Spencer reflected, didn't have the same privilege as he did or access to computers for schoolwork. He explained more, "I think that people, my friend, my peers that lived in urban areas, they did have computers, but I don't think that they had, could use them, or had the freedom to use them nearly as much as I or some of my peers in my district." He paused, carefully gathered his thoughts and expressed that he felt that exposure to technology in school is important for all students. Lack of exposure would place students at a significant disadvantage in higher education and when they entered the workforce.

Although Spencer was exposed to computers at an early age, when I asked if he fit into the description of a "Digital Native", Spencer self described himself as "old fashioned" when it came to technology use. He used technology for some things, but still preferred to do some tasks by hand and had only really learned what he considered the basics on his own laptop: word processing, spreadsheets, and presentation software. He was quick to point out that he had just recently purchased his first smart phone, having owned a basic flip phone since he lived at home during his K-12 education. Spencer elaborated that even though he had a smart phone, he didn't "live on it" and had very few apps in addition to the apps that came with the phone when it was purchased.

>He explained his thoughts:
>The reason I don't like to have so many apps and everything is when I didn't have a
>smart phone and all my friends did, I hated those people that were always on their phone

always having these different apps, all these different things on their phone and a lot of it I really did think was, you know, somewhat helpful, but a lot of it was kinda pointless. So when I got it, I was kinda like, I gonna limit my app usage, and cause I know how to download apps, I know how to get apps, and people always want to download the newest app on my phone. But I think that I purposefully chose not to do that so I don't live on my phone.

The apps he did use included social media sites such as Facebook and Instagram. Spencer said that social media "would be the biggest aspect where I think I can agree with that statement" about Digital Natives and their ability to use social media. He had been using social media sites, primarily Facebook, for over five years, which would date back to the very first days of the service. Since he left his home state of Illinois to attend a university of out of state, he was "always on it" connecting with his high school friends back home. He laughed as he said, "Freshmen year, I lived on Facebook. I was, I had, I just moved, cause I'm from Illinois, just moved to Middleville and the first few weeks I was still transitioning to being a new place, so I was always on Facebook talking to my friends, and then when I started to gain more friends, I'd be on Facebook talking to them, as well as talking to my friends." He even went so far to describe his use of Facebook his freshmen year as "unhealthy." What about texting? Spencer quickly answered, "I don't think I became a chronic texter until sophomore, junior, senior year. But I was kinda on my phone, and my phone at the time was already starting to get old." As his undergraduate career advanced, his habits changed and he connected to social media on his laptop, instead of texting with his flip phone. It became his technology communication device as his exposure to other technology increased.

During his sophomore year he took an online course and felt comfortable with that mode of learning. He took three more online courses throughout his undergraduate career, including one that included prerecorded lectures. Additionally, Spencer had experience with participating in online discussion boards as part of the requirements for some of this general education courses. He readily admitted that his participation in online discussion boards paled in comparison to his use of Facebook or other social media; even though he felt he got value out of the online discussion boards, he did the minimum participation that was required for the course. When pressed about how he knew he was learning, Spencer thought for a long moment and replied that when he left class sessions thinking, "Whoa! I really learned a lot!" or "They really relayed a lot of information" he knew he had just learned something new. He applied these same thoughts to learning with the aid of technology, "I think that for me learning with technology would kinda fall into the same thing, but uh, its a little more difficult, I think from what we've stated, what I've said to peers is that I don't feel quite as stimulated, from discussion, as opposed to, with the distance, or the technology as I would something face to face." He continued this thought, expressing that his idealized classroom setting would be one where everyone is participating and valuing each other's opinions.

Driven by assignments in his College of Education courses, Spencer learned the video recording and editing process. And although at times he spent "a lot of time hitting my head against the wall because I didn't know what I was doing," he though the assignments were "something that really was beneficial that I did." Additionally, as part of his coursework, he had to learn how to use and edit a wiki and start a blog about his placement experience in a classroom during his senior year. Unlike James, most of his new experiences with technology were academically driven, not spurred by peer projects outside of the classroom. Taking into

consideration his experiences with technology in the classroom, when I read Spencer the definition of digital literacy, he gave it some thought and confidently considered himself to be partially digital literate. Explaining further, he said, "I think I'm better than some, but there's still a lot that I don't know what to do as far a computers, cell phones, and a lot of different things. I think that I can keep up, and I'm able to learn. I'm not resistant to it, like maybe someone like my mother is, but like, I don't, I don't think I'm as literate as my peers. But I also don't think I'm digitally illiterate." So even though Spencer saw himself as "old fashioned" in many aspects of technology, including how much time he spent using his smart phone and the number of apps he used, he still thought of technology as a seamless part of this life in his day to day actions, just not to the extent of many of his peers.

Internship Experience. Coming into the teaching internship year, Spencer had some experience with taking distance education courses, so expectations for distance learning for the internship year were neither high nor low. But he was confused about the format of the classes and what technology was going to be used. He had heard that Skype was going to be used, but the class structure was not clear to him.

He elaborated:

I knew that we were going to be in the high school, but I didn't know if we would

be Skyping in or not, so that was one thing that confused me and then the other thing that

confused me was, you know, with us being secondary education interns, would we all

meet in the same room for, um, our secondary placement, we all knew that we were

social studies and they were something else, we were like are we going to meet in the

same room. Maybe have a session devoted to each subject area so that was one thing I

was confused by.

The video conferencing technology being used was not Skype, but a room-based hardware solution by Polycom, that required the attention of a technician to get set up for every class meeting and not a technology that Spencer had been exposed to before the internship year. Despite his unfamiliarity with the technology, he wasn't all that concerned; more curious as to how it would all work out.

Throughout the internship year, Spencer had opportunities outside of the scheduled class time to participate with his instructors in one-on-one conversations using Skype and collaborate on an assignment with a fellow student taking the same class at the home campus. Spencer and the other student used text messaging and email to share stories about their respective internship experiences. He searched his thoughts and described this collaboration for me, "I paired up with someone that was in the Midwest State University area, so that was pretty cool because then I could see the difference in students behavior, students motivation, students, learning and compare them to my situation and I think that was very beneficial for him as well because he, he was asking a lot of questions about my school, as was as I to him." Despite the opportunity to collaborate with his peer, he still felt that there was a lack of understanding of the context he was teaching in, "I think it was really interesting to see the difference and he doesn't really know my school, all he can really see is the back of a door, or hear the bell go off for 20 seconds or hear you know kids yelling or talking or socializing in the background. So he doesn't know the context of where I am." Spencer had similar qualms about his class meetings through the video technology.

In the same line of thought, Spencer explained that even though he thought the distance video technology was great because of its ability to connect students to classes anywhere they could be located, he also thought there was something lost in the translation during the

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communication. He and the others in his cohort felt that they were a minority in the morning class that had students at the home campus.

> With a slight tone of frustration in his voice, Spencer said:
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> So I feel that we're the minority so it's hard for us to necessarily say what we feel and what we think when you know, as it should be, there's more people in the classroom setting, there's maybe 16 people there and the 3 of us here, it's harder for us to get our opinions out and say what we think and what we feel, which I don't know if that's anyone's fault, but it's difficult for us.

He lamented that he felt like he and others spent a lot of time just staring at the video signal on the projector screen coming from Middleville; uncomfortable with jumping in and participating unless directly asked to participate by the instructor. So they found other things to do to pass the time: grading, email, checking Facebook, or other Internet resources like ESPN or news sites. Spencer elaborated, "By the end of week, so if I have grading or something that is pressing I might devote class time to do that. I know that's wrong but at times it feels like we are just sitting there and staring into space, so why not use this dead time to, um, get something done." Spencer felt that if had he been asked to participate more during the live videoconference class sessions, then maybe he would have been more engaged. He also felt that the internship experience was so different between the Big Lake City students and the Middleville students that there was a natural barrier for the Big Lake City students to not share their experiences by participating in the discussions.

> He slowly gathered his thoughts and articulated:
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> Over here a lot of what we're learning, what we're experiencing is a lot different and so

we can't relate to that and then also for us to jump in and explain or to talk about it, is a little more difficult than you know, saying it over there…And it's hard to get any good feedback especially when people aren't exposed to what we are.

Indeed, one of his favorite classes during the year was a visit from the morning instructor to Big Lake City and the face-to-face class he conducted with the cohort. For Spencer, that class session was very engaging and stimulating because, "I could see the teacher and he could be right there to guide us, or lead us in a certain direction, as opposed to, if we have something or he's giving us something we have to kinda lead ourselves (when he's not here) and then kinda go and show him if it's right or not." He had similar strong feelings about the second class that the cohort participated in each Friday afternoon.

When Spencer spoke about the afternoon class that combined all the students in the secondary education program but only had an instructor and teaching assistant on the other end of the videoconference, he didn't have the same isolation feelings like he did with the morning class. However he expressed that he and the other students were a little unreceptive to the instructor's teaching style and the format of the class. A format that included some feedback from the instructor about assignments, directed tasks for group work, and periods of interaction in between the group work. He felt that she was just trying to get through material and not really trying to understand their experience. In this situation, technology did not create the barrier for participation; the teaching style of the instructor became a barrier for Spencer and the cohort.

Reflecting on the entire internship year, Spencer lamented the class time lost to technical problems with faulty equipment or network issues in the building at the beginning of the year, "Some classes we missed a half class or we missed almost all of class because of some, some

sort of, tech, technological issue." That being said, he also felt that distance education allowed

him an opportunity to complete his teaching internship year in a setting far away from the home

campus. He did not have to be "next to" someone to learn from them, "I think that's been really

helpful and I've seen I can, I can see to work with others when I'm not within a hundred miles of

them."

> He continued on expressing some frustration with the disconnectedness of the
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> experience:
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> But I think it's been, it's hurt just because this Big Lake City experience there's a lot of
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> crazy things that happen that you don't expect and I think this year it's been crazy and I
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> think that the distance of learning and using the technology has been hurtful because the
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> instructors they don't get to see how we are they can only see through a video, they don't
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> see us, or get to have contact with us any other time of the week they get to ask but they
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> don't physically get to see us and I think that's what hurt us because I think that when you
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> are in your internship year it's hard on everyone and I think that people in Middleville
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> have had a little more privilege and come in and talk about their experiences…we tend to
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> rely on ourselves.

Despite the feelings of a lack of social presence during the video conference class session or

connection with his instructors, Spencer strongly believed that he would rather have video

classes than having all his interaction with his instructors be completely online through a course

management system and discussion boards, "The video I think that it provides some sort of

interaction although it's not what I'd want, I think it's better than just having things specifically

on Angel or just having to post stuff in a dropbox."

The Story of Jessica

  Background and History. Jessica was a 24-year-old African American female who graduated from a suburban high school in 2009. She had a confidence about her that was evident as soon as we sat down for the interview in a classroom at her placement high school. Each question was answered without much hesitation and concise details. Jessica considered herself a Digital Native; she didn't know everything about technology, but she was more or less digitally literate. She knew how to download programs, install them, save files to a USB flash drive, download photos or music from music sharing sites, make a video, and search for things on the Internet. Multitasking was just a part of her daily life and she nonchalantly declared, "Technology makes it really easy to get several things done at once." Exposure to technology started early in her life.

  Her childhood home had at least two computers, including a laptop and desktop, cell phones for both parents and multiple televisions. In the eighth grade, Jessica got her first Apple iPod and in tenth grade, her first flip-style cell phone for making calls and text messaging friends. When I asked her about her parents and their use of technology, she described both as "fairly literate" in technology knowledge, but her dad was tech savvy to the point of being able to "fix technical issues", whereby her mother did not share that skill. Her mom knew how to use the basic functions of technology like a smart phone or an iPad, but "that's about it." Jessica also considered most parents of her friends to be technology literate, but not all her friends had the same abundance technology in their homes as she did. In her K-12 setting, Jessica had access to computers in two labs: one for computer programming classes and the other in the library for general use. Classrooms at her schools were also outfitted with data projectors and audio/video

systems for watching movies in class, all things she described as "pretty standard" by the time she graduated from high school.

When she entered college, her parents upgraded her cell phone for a smart phone, purchased an Apple MacBook laptop for her, and by the time she completed her senior year, she also owned an Apple iPhone and iPad. Jessica proudly spoke about her Apple devices and how she learned to synchronize all of them so she could access her content on whichever device she was using at the time, "I actually learned that from one of my friends who's really like Apple tech savvy and they taught me, you know, cuz you have to sit… it makes your life easier after you know how to do it. So I definitely had to sit down and be trained on how to navigate my Mac. My Mac gadgets."

During her freshmen year of college, Jessica's use of technology included spending three to four hours a day working on assignments for classes, text messaging or using Skype to talk to friends, and taking pictures and video with her smart phone. These activities continued throughout her college career, adding in social media use along the way. By the time she reached her senior year in college she had limited her Facebook use and replaced it with Twitter and Instagram. Her technical abilities evolved and she was able to use different software and Internet cloud-based services like Prezi to make presentations for classes.

Learning how to use Prezi was an assignment in one of her senior year teacher education courses. Jessica credited that course for not only challenging her to learn to use Prezi, something she was not at all familiar with, but also to explore other technology that she had not been introduced to previously, including completing online surveys using her smart phone. She said with appreciation, "I would say my TE instructor my senior year did a really good job of trying

to infuse technology in the classroom. So when we had to present different materials, he would always encourage us to be a little more creative with using technology and how we present it." Along the way in some of her other classes she also learned how to navigate the Internet in a more efficient and thorough way to find information for research papers. Jessica expressed that since she was going to become a teacher, she needed to "expand my repertoire" with what she knew how to do.

When read a definition of Digital Literacy, Jessica thought for a long moment and then replied, "So I definitely have engaged in social media so I have an online identity, I guess you would say. And then the other main thing I got from that is understanding how to utilize new forms of media, anything that's digital. I would say that I guess I'm pretty literate. I mean, I just, I don't know, something's new, you just learn how to do it. It doesn't really take a lot of effort. I don't really know how to describe it." She continued, "It just feels natural, like a lot of kids or people my age are, since you already know how to do so many other things, if it's like a new app or a new like tool, it doesn't really take you that hard to kinda get the swing of it." Jessica expected to use technology in her classes because to her, that has become the norm: readings, assignments, and papers are turned in using technology.

Expecting technology to be used in a course and participating in a technology-mediated online platform were two different contexts to Jessica with different expectations for participation. She quietly confessed that she only did the minimal participation necessary to get full credit when her online courses required participation in a discussion board created by the instructor on the campus course management system, but a Facebook group created by the students generally generated much more participation and collaboration about assignments and course topics. "Oftentimes, the Facebook group has been made with my teaching classes and

usually we spend so much time together, we're just close so we just make a Facebook group and we keep each other updated on different things we need to do," Jessica explained. When I asked her to further explain her reason for minimally participating in the online discussion board in the course management system, she explained that the format was too hard to navigate and Facebook was something she was already familiar with and it easy to use.

Internship Experience. Before the school year began, Jessica did not know what to expect from the video conferencing technology. Her only expectation was that any "glitches" would be minimal and as someone who considered herself fairly tech savvy, she'd be able to fix any issues that came about. This did not end up being the case, as she felt uncomfortable "messing around" with the equipment and trying to troubleshoot. Jessica then paused and described how she did not feel comfortable troubleshooting the Polycom video conferencing equipment used for classes because it was "not her own" and required more equipment and effort to set it up and make it work. She left the troubleshooting to James.

When the conversation turned to her thoughts on the entire experience of distance learning, Jessica thought for a moment and then replied, "I don't really know but the expectations that I had, that I did expect, I expected for myself to be more engaged." She continued on reflecting that she really learned from the experience that she prefers to be in the classroom with an instructor because by nature she is a talker and engages in class conversations. Maybe distance education courses work for some, but not for her. Despite this, Jessica had a very positive perception about the benefits of technology in an academic setting:

She thoughtfully explained:

I think that technology can be very beneficial. I mean, it is very beneficial but I

think the beauty of where technology is going, where it is, is that it allows you to

communicate with people, a lot of different people at the same time. It allows you

to access information very quickly and to communicate that.

But she also pointed out there was a downside to technology when a lack of facilitation leads to disengagement and a feeling of isolation by some of the students. Open doors to disengage lead to multitasking and "doing a million different things at once." During the morning social studies classes with Professor Smithton and Mike, Jessica engaged as much as was expected of her, but also felt that the majority of teacher facilitation was focused on the local students, whether it was intentional or not. For the afternoon classes with Ms. Leighton, Jessica felt much more engaged, but that was also the nature of the class whereby Ms. Leighton could only focus on the Big Lake City students because of the absence of students in her room.

Outside of the course meetings, Jessica participated in individual meetings with her instructors using FaceTime, Skype, and email and she co-edited documents using Google Drive. And for that one assignment that paired her with a student back at Midwest State University, Microsoft Word documents were shared back and forth via email after each person added comments and suggestions using the Comments function of Microsoft Word. Again, this type of technology use felt normal and natural to Jessica, unlike the videoconference technology used for class meetings. Would training on the video conferencing equipment before the internship year have helped her reluctance to solve small problems that occurred during the year? Jessica was sure that training would have helped. Not only for the students in Big Lake City, but for instructors at the main campus. "I think it would've changed it in a positive way if every single one of us were a little bit more educated on how to do everything," she replied.

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How distance education technology shaped her internship year was up for debate, even in her mind. She felt she was leaving the experience more capable of having her own classroom and she definitely learned and grew as an educator from the year-long experience.

> But yet she reflected:
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> I think it, I think being at a distance, it definitely had its own little feel to it. I would honestly say while it wasn't like a horrible experience at all, I would honestly say that based on like being on a distance and being accustomed to being in the classroom, for my class, where I was like a part of a class, I didn't really feel like I was like in that class. You know, it was just, while it was good and I learned, I did learn a good amount, I didn't really feel like engrossed in the experience with everybody else.

Jessica added that the group in Big Lake City formed their own community for support since there was a feeling of disconnect from their peers at Midwest State. In spite of the feeling of isolation created by the video conferencing medium, she confidently asserted that she wouldn't hesitate to use video conferencing of some sort and in some contexts to bring guests into her own classroom some day. Even going so far to form a partnership with a school abroad so her students can share experiences with the students at the other school and gain a global perspective on education by using distance technology. When I pressed her about her earlier resistance to troubleshooting the equipment used for her internship year classes, she was sure that if she was using her own computer to facilitate the distance sessions for her own kids, she could troubleshoot any issue and make the connection work.

The Story of Emily

 Background and History. Emily was a Caucasian female, born in 1991, raised in the suburbs of Big Lake City, and graduated from high school in 2009. Even though she was born during a year considered to be in the heart of the Digital Native birth years, she described herself as someone who became a Digital Native, not someone who was a Digital Native because of when she was born. She shifted in her seat in the coffee shop where we agreed to meet and slowly explained, "I would say that I have become a digital native but I was not up until a certain age… I'd say I've become one and I'm slowly learning more and more, but it took a while." She did not consider herself "tech savvy," and went on to explain that it took a lot for her to learn technology, eventually adapting to it but that it takes time for her to master a new skill.

 When she considered her general understanding of digital literacy, Emily again took some time to gather her thoughts and expressed that she understood that being digitally literate included a basic understanding of technologies like computers, cell phones, gaming systems and knowing how to use technology as a tool, but she also did not consider herself to be on the same level as some of her friends; not digitally illiterate but less so than other people. She continued on with this thought, making a point that she was working really hard to "step up her game" to be more proactive about learning how to use technology. Some of her technology skill limitations were also a reflection of how little technology she was exposed to growing up.

 During elementary school, Emily could only recall having access to circle system tape recordings, but no computers. Once she entered middle school and high school her classrooms had a desktop computer, a laptop cart was occasionally made available to teachers to use in class, and each school had a least one computer lab. She did not remember having access to any other

technology items in her classes, the school library, or specific technology related classes, like computer programming, other than the keyboarding classes she had to take high school.

As far back as she could remember, Emily's family had a desktop computer. However, she was quick to add that her parents "weren't ever super tech savvy either." Her dad got a laptop when she was around 16 years old and her mom did not get a laptop or iPad of her own until Emily was in college. It also would have been out of character for her friends' parents to be really tech savvy. As far as Emily's early ownership of technology, she got her first Motorola Razr cell phone when she was in 8th grade and primarily used it for making phone calls and retrieving voice mails. When she entered high school she was allowed to start using it for texting, but not Internet surfing. It wasn't until she got her first iPhone and a MacBook Pro as a high school graduation present that she started to explore technology and even then her explorations were limited to learning basic functions of the devices.

During her freshmen year of college Emily's use of technology included emailing with her iPhone and laptop, posting on social media, and completing homework assignments in Microsoft Office applications. She quietly and slowly reflected on her technology use, "So when I first started freshmen year, I mean, I had trouble like figuring out even PowerPoint and Excel but then I slowly learned I needed to fix that so like even now I, not recently, but within the past year or two figured out how to really organize my computer into folders and take the documents and put them on my desktop and things like that." Emily continued on describing how she had taught herself enough about her computer and iPhone and because of this self-taught experience, she had started teaching friends how to set up their email on their computers and smart phones. A portion of her new confidence with technology came from experiences during her undergraduate classes.

A handful of classes during her undergraduate years required Emily to learn how to use certain technology and based on those experiences she applied the technology to other contexts. For one of her online classes she had to use Weebly to develop an online portfolio and create a teaching website to share classroom resources with parents of the children in her senior year classroom placement. Additionally, one of the main projects for the same online class was making a screencast (a recording of her computer screen) demonstrating her ability to use the free online blogging tool Blogster on her computer. Once she completed the creation of the screencast, she had to upload the finished project to the video sharing site Vimeo and share the link with her classmates and course instructors. As she described this assignment, it was apparent by the inflection in her voice that the assignment was a real challenge for her, but she persevered and taught others the same workflow, "Now I can do it, not that I remember everything about how to do it, but I could figure it out." As our conversation continued, Emily continued to share more stories about her growth into a Digital Native.

During another class which had a concentration on Universal Design for Learning (UDL), Emily had to create a journal of special education resources using a software tool called Evernote which is a cloud-based tool that synchronizes notes across all user devices like their personal computer, smart phone or tablet. Emily expressed a sense of accomplishment because she continued to use Evernote after the class concluded, "I use it all the time. That's where I take all my notes for school. That's where I take all my notes in my placement. That's where I keep pictures cuz I know I won't lose it." When our conversation shifted to discussing the use of her iPhone and how it had changed compared to when she first got it, she replied that she used it for everything; email, texting, Internet searches, checking the weather, checking sports scores, checking social media sites like Facebook, Instagram, and pinning educational resources to

Pinterest. From her freshmen year to her senior year, Emily described her leap in digital literacy and technology knowledge as sizable enough to feel like she could make better decisions with how to use technology as a tool.

Internship Experience. Before the internship year began, Emily understood that her Friday graduate level classes would be facilitated by videoconferencing using a Polycom room system and that her communication with her instructors would be done using other communication tools like email or Skype. As a result, she felt that she would have to "step it up" and "be really tech savvy on Fridays" to be ready for class and "If something was going on with my MacBook, I knew that was something I needed to have fixed prior to Friday because I needed it every week." Being prepared for class every week became a positive outcome for everyone in her cohort, as Emily became the go-to person to troubleshoot any issues with the Polycom and communicate with the teaching assistant in Middleville through Skype messaging about any equipment problems or questions from the cohort about course content. She also used Skype outside of class to have virtual office hours with her instructors about daily experiences in her internship placement and to discuss course assignments.

Skype was often used during class for collaboration between the Big Lake City teaching interns and their peers in Middleville for group work. Emily was enthusiastic about this feature of her classes and expounded, "We had to do Skype quite a few times. When they would get into groups, some of the professors would have us Skype in with groups there so we were interacting with them which was great." In addition, within the group in Big Lake City the interns would collaborate on course projects using Google Drive, text messaging, and occasionally Facebook messaging. However, participation in the larger class setting, which comprised the majority of

the time during the distance education setting, was not equal to the collaboration in the smaller groups.

Participation through the Polycom videoconferencing system during class was limited. "We would turn the speaker on and off when we had to talk to them…it was awkward for us to chime in, be like, oh, I have a question or participate in a game they're playing or some sort of activity," Emily reflected on her participation. She continued, "I mean, obviously, we, no one was looking at us the whole time so we would be, you know, doing different things all at once. I'd be lesson planning and listening to them and not participating on purpose because there's so much other stuff I had to do." Her participation also varied from class to class. Some faculty made it easier for her to participate by recognizing the group in Big Lake City, while others, she felt, made no effort to include the group.

> Emily described the situation further:
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> Some professors are extremely aware of it and they understand that it's a lot harder to pay attention with so many distractions and some professors just talk at you and never, you know, speak up or never ask for any input or it's inconvenient if we jump in or something like that. It's like I'm just watching a video.

When asked to compare her participation in this situation compared to the online classes she completed, Emily replied that for her online classes she only did what was required of her and nothing more, "I really just do what I need to do, then get off of it." However compared to a face-to-face course, Emily confessed that she normally participated more. For example, when she made a trip back to Middleville to take part in one of the face-to-face classes, she again felt like she could resume her typical level of participation. But there were other reasons why

Emily's participation dropped off when she attended the video conferencing courses in Big Lake City.

On top of that disengagement with the video conference, Emily confessed to always multitasking during class; working on lesson plans and preparing other placement activities while she moved the camera on the Polycom and Skyped the teaching assistant in Middleville.

Emily leaned into the digital recorder and walked through her habits during class:

So a lot of times, I would just kind of sit by the speaker so I could hear. So I'd listen to what they were saying and making sure we were still on task but also, I mean, always doing my Friday lesson plans. Always making sure I'm preparing myself for next week in my placement. So I was always multitasking through both technologies. Flipping the camera on the Polycom so we could see where the professor was walking around and then seeing the presentation slide he was on.

Although multitasking was a distraction to her participation in class, she admitted it was normal for her. If she were working on a paper or another school assignment, she would also check her email, work on her portfolio, and be texting or emailing someone.

Emily believed that her previous experience with technology during her undergraduate education helped her "figure stuff out" during the internship year and that the use of distance technology during the year would inspire her to create unique experiences for her own students in the future. She excitedly described one idea, "Well, something that I really would like to do with distance technology in the future is have some sort of like Skype pals. So that my students can be immersed in another school or another culture and kind of learn and teach others through that. And it's just so much different to see something than just to read about it or hear it." This

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idea was partially inspired by the opportunity she had to use technology with the students in her placement, which created a foundation for her beliefs about what she could do in the future. For example, her 4th grade class had access to an iPad cart every day, so she had the experience of creating lesson plans around the use the iPads, For Emily this was a great opportunity for her and her students because in many situations and contexts in the future they would "have to interact with basic technology every day" and "It just taught me how important it is to have it and for me to be really updated with it so that I can keep them updated." But learning the technology takes patience and effort for Emily in her own learning process and when she is teaching her students. She described herself as a learner that requires scaffolding before she can claim mastery.

> Emily shared her process of learning technology:
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> I definitely need some sort of scaffolding. So I need to watch someone do it. I need to see exactly how it's done and even sometimes after that, I try and do it myself but I really need someone to sit down with me and say this is what you do, this is how you do it, this is what happens if you go wrong, if it goes wrong. And then after that, I'm pretty good with it but I really need someone to instruct me when it comes to technology

She also felt her students needed constant management to stay on task or monitor inappropriate apps or websites. But she acknowledged that if she were depending on the Internet or technology for teaching, there would always be difficulties that arise. This is part of the learning process for her as a student teacher.

The learning process during the internship year had some bumps. Emily articulated that the distance technology of video conferencing with the Polycom, Skype, and other collaborative online technology didn't work to her benefit as a learner at specific points in the program.

Despite the ability to connect to her instructors and peers in many ways, when she was confused about an assignment or project, "it would be a hassle for me to make arrangement to talk to someone. Because we weren't there in person, everyone else had a chance to walk right up to them after class and say, hey, I have question on this…I had to make an appointment almost and say, okay, at 12:05, can we Skype today." In the same thought though, Emily expressed that it was still a great overall experience because she was able to have the experiences of the internship year in Big Lake City and still learn and do most of the same things as her peers. And as much as there was a pronounced distance between her and her classmates in Middleville, she would not have been able to do the program completely online without the all day interaction through the video conferencing. She explained this thought saying, "I wouldn't, there's no way I would've been able to do all online classes, but that's me personally. I need some sort of stimulation, I can't just stare. Which I mean, we were just kind of staring at a screen all day, but at least we were looking at people." She would need to, at the very least, see and talk to people on a regular schedule to feel like she participated in class and had a chance to collaborate with peers as part of her learning process.

The Story of Olivia

      Background and History. Olivia was a 22-year-old Caucasian female born and raised in the suburbs of a large metro area in a two-income household. She considered herself a Digital Native, agreeing that the definition of the term fit her, "I think it spot on fits. Kind of my experience growing up with technology, I will, I guess not necessarily my entire experience, but definitely from like middle school, high school point on." In seventh grade, she got her first cell phone, a flip phone by Virgin Mobile that was a pay-as-you-go model for talk minutes and texting. The next year in eighth grade, she got a new flip phone and was added onto her parents

mobile plan. This was the phone that she had until she got her first iPhone in December of her senior year of college. In her K-12 classrooms, Olivia was exposed to computers through a laptop cart program in middle school, computer labs in high school, and some of her teachers began to use data projectors with PowerPoint. Prior to middle school, Olivia had very little exposure to technology at school, but at home it was a different experience.

Although she did not consider her parents tech-savvy, her mother had to work on computers as part of her job requirements, including typing really fast, completing basic job-related tasks, and performing basic Internet navigation. Her father, however did not use computers in his place of work and therefore had low technology skills, only learning how to utilize email within the previous two years of this study. Compared to the parents of her friends, her father was outside the norm whereas her mother's technology skill level was more typical. Unlike her parent's exposure to computer technology for work, Olivia and her siblings used the PC at home for school assignments, basic gaming, and Internet surfing after her parents subscribed to an Internet Service Provider. In addition to access to a computer at home, Olivia and her siblings had a Sony Playstation 2 for gaming, multiple televisions in the house, and DVD players.

Eight months before arriving at Midwest State University in the fall of 2009, Olivia purchased her first MacBook Pro laptop and began the process of learning the new operating system and becoming familiar with some of the software on the computer. She recalled her learning experience, "Before coming to Midwest State, I would say I had mastered Microsoft Word, but nothing (else), I could download and play games and we used social media and stuff but before that, I mean, that was kind of the extent of my technology experience. And then like some video games, but it was never something that I was really, really interested in." During her

freshmen year of college, Olivia's technology use evolved but she struggled at first using the university course management system. However, it became easier as the year progressed. In addition, her use of social media, like Facebook, steadily grew and she used it to communicate with friends and family and copious amounts of text messaging occurred between Olivia and her friends and family. An upward trend of technology use and familiarity continued as Olivia moved through her undergraduate years.

By the time she got to her senior year, she had been exposed to a variety of technology in her education courses including voice-to-text technology apps for iPads and computers, interactive e-book applications, document cameras for classroom projection of artifacts, and assisstive technology for special education students. She remembered fondly two instructors in particular that took the time to integrate technology into their courses.

Olivia spoke with reverence about the instructors:

Adeline Stevens, she was my CED401 and CED402 instructor…for language arts and social studies and she was really awesome. Always telling us about really cool online programs and literacy stuff. And just all sorts of things she was trying to expose us to, so she was really awesome. And Ned Whitting, one of his classes about technology and universal design for learning I would say is where I learned the majority of what I know outside my internship.

Facebook groups were also used extensively during her senior year in teacher education classes to communicate about random assignment questions, feedback about class content, and to plan social gatherings. Compared to her participation in the university course management system discussion boards, Olivia felt more comfortable in Facebook groups, as long as there was no

instructor presence in the group. These experiences with technology in her coursework were the building blocks to her understanding of what it means to be digitally literate.

To Olivia, digital literacy meant "There's all these digital and technology tools that can like help you learn about those things and you need to know how to play a video on a website and navigate through a website to be able to read those things. You have to have concepts of knowing how to navigate through technology, to know how to learn information through it." Despite learning many new technologies during her senior year of college and extensive personal use of technology for communication, Olivia expressed that she lacked a certain amount of digital literacy knowledge, "I feel like I know as much as I need to know to like get by but maybe a little extra." I was surprised by this evaluation of her digital literacy knowledge considering the experiences she described earlier in the interview about learning new technology in her classes and how she applied them to her personal life.

For example, she learned Evernote in Ned Whitting's CED class, and then began using it daily for personal notes. In addition, she used YouTube to look up video lectures on class topics and then continued to use it to look up videos of things she liked to do in her personal life. When I explored with her why she considered herself to have lower digital literacy skills, she hesitantly said, "I use my GPS all the time and things like that but I'm not like…I'm not like researching new stuff all the time. I'm kind of more active, in the moment sort of thing." And then almost as an afterthought, Olivia remembered an online summer course that she took, TCH417, that required students to use Weebly to create a website. Once the class was completed, she continued to use that website as her online teaching portfolio during the internship year. But yet she initially left this experience out of her recollections about influences on her digital literacy growth.

Internship Experience. Olivia entered the year-long internship year with an understanding that her MSU classes would be facilitated using videoconferencing technology by a Polycom room system, but she wasn't sure exactly how or what that would look like once classes started. She attended an orientation a month before she moved to Big Lake City, but that did not clarify for her what the class experience would be like. Once the semester started and she was immersed in the experience, she was impressed by the ability of the system to show a clear picture of the classroom in Middleville and the Big Lake City interns ability to control the cameras in Middleville classroom to get a better view of whomever was talking and the content being delivered via the data projector and screen in the classroom. Initially she confidently stated, "I just think my expectations were exceeded as far as the technology." Although as she thought about it further, she confessed that it was also easy to use the technology to tune out and not pay attention.

> Olivia thought about it further and explained:
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> It made it really easy for us to kinda get distracted in our own conversations. You know, sometimes they were relevant to what we were doing in class and sometimes they weren't. You know, but it also, we all had to like figure out what we needed to pay attention, just to finish the coursework, you know what I mean? But I kinda did appreciate kinda being able to tune in and out when I wanted to because it gave us an opportunity to really grow as a cohort and we had to kind of adapt to knowing when we needed to pay attention, when we needed to participate and kind of also adapt to the craziness that was happening in the school.

It was easy to get distracted by other events at the high school such as the bell going off, teachers coming in the room to use the copier, or look for files in cabinets. That said she also saw the

benefit of being able to be in that context and still participate in the classes at Midwest State University.

During both semesters, Olivia was able to collaborate and participate with her peers at Midwest State University using Skype for small group discussions or group text messaging to discuss class topics. In addition, most their group projects were completed using Google Drive to collaborate on papers on presentations. Communication with her instructors was primarily done using email and some post and response interaction on class discussion boards in the university course management system. Olivia strongly emphasized that she very much preferred to communicate using text messages over email since she did not check her email as often as she checked her phone for text messages. Notwithstanding her ability to communicate with her peers and instructors using different technology tools, the distance between them did add a contextual barrier.

Similar to other interns, Olivia expressed that although she had a cohort of peers with her every week for classes in Big Lake City, the distance technology used to participate weekly changed her level of participation from what it had been in four years of face-to-face classes. She wasn't as vocal as she normally would be in those classes. "I was like probably one of the people that would talk the most in my (face-to-face) classes and that wasn't the case at all, " she echoed the other interns.

Continuing on she added:

There was like, maybe we were just overthinking it but it just seemed like there was some weird tension between like how it would interrupt when we would be active participants in the discussion. Like they can see you but they, a lot of the times, you're not really on,

they'll have like PowerPoints or something up. So I mean, it made it really easy for us to

kinda just like get distracted in our own conversations.

The one to two second delays inherent with video conferencing and her feelings of interrupting

an ongoing discussion in Middleville added to Olivia's suspicion that there was a forced

obligation to include the Big Lake City interns. That being said, Olivia expressed that she

appreciated being able focus on building the relationships between the members of the cohort in

Big Lake City when they tuned out, "I kind of appreciated our ability to not necessarily sit there

in silence for nine hours," she concluded.

Building on the thoughts about technology and how it can be manipulated in different

contexts, Olivia felt there were advantages to technology use in the higher education classroom

and in her teaching internship placement. Her previous experience with technology in her

undergraduate classes helped prepare her for the internship experience where she had to use

technology to communicate and participate with her peers and instructors. She paused for a

moment and reflected, "It definitely helped. You know, even though I didn't have experience

making SmartBoard lessons, for example, I knew what a SmartBoard was. I knew some of the

things it was capable of doing. And just being more open with like assistive technology and, you

know, know that technology doesn't necessarily always have to be something that's a couple

thousand dollars." Olivia used her experience with different technology to create learning tools

for her students in her teaching internship classroom, such as interactive lessons with apps on her

university issued iPad.

While Olivia enjoyed using technology with her internship classroom students and

managed to navigate technology as the main mode of communication and participation for the

Midwest State University classes, she strongly emphasized that putting laptops away and interacting with peers face-to-face or practicing teaching methods with each other was her preference. In the same tone, she voiced her concern that the distance between her and the instructors was difficult because they couldn't just ask a question in class, they'd always have to email. Or at least the situation seemed that way to Olivia. She summarized her thoughts with a concerned inflection in her voice, "It was just hard, like if we had a question, sometimes it was harder, like if something on our project and stuff, like we'd always have to email. You couldn't just be like, hey, could you read this real quick. Let me know how it is. And then you move on. You know, it wasn't, we didn't really have that, that flexibility." She continued on in the same answer though, confessing that having the video was an immense benefit, "It was helpful that we were able to see them rather than just hear them, if it was like an audio recording. That was nice for sure." But even then, she wasn't sure if having video helped overcome some of the frustration with a lack of social presence, "It's just like hard, when we had to do our group presentations, and we wanted it to be like interactive and have materials sent, it was just really hard for them to understand what we wanted them to do. And sometimes it would go in and out so that was sometimes how it was ineffective." So although the video communication technology helped her stay connected, in her final reflective thoughts Olivia said in frustration, "I'm not gonna lie. I didn't get, some days I wouldn't get anything out of the classes. You know, partly my fault for disengaging but partly, I mean, the teacher's fault, too, for just talking at us and making it so boring and...And I would've appreciated being able to spend those nine hours, you know, listening to it at home."

The Story of Lori

      Background and History. Born in 1991, Lori was a 22-year-old Caucasian female who graduated in 2009 from a suburban high school in Metropolitan Detroit. She was soft spoken and unassuming in her tone. We spoke via telephone because she could not commit the time to a face-to-face interview during one of my two scheduled visits to Big Lake City. Our conversation started with thoughts about the role of technology in the home during her early childhood, adolescent, and teenage years. Technology was prevalent in her home growing up, including a computer shared by her and her brother, a gaming system for her brother, cell phones, and multiple televisions throughout the home. Her parents had minimal technology knowledge: her dad used a computer for work because he had to and her mom did not really ever use a computer. Even in more recent years, when Lori's mom got a smart phone, she relied on Lori to explain how to do things that Lori considered simple tasks, like downloading an app or adding an email address or phone number for a contact. Conversely, Lori got her first cell phone, a flip style phone, in 8th grade and used it extensively to text message her friends or to call her mom when she needed to be picked up from school or social events.

      In school she was exposed to technology at all grade levels including computers in the classroom, computer labs and then SMART Board Interactive Whiteboards in high school. Additionally in high school, she was involved with the high school yearbook, which gave her another opportunity to learn electronic publishing software like Adobe InDesign on high-end Apple desktop computers. This experience in high school with Apple computers was valuable for Lori because by the time she got a MacBook Pro laptop as a high school graduation present from her parents, using the new computer was extremely comfortable for her.

Taking this experience into consideration, when Lori reflected on her identity as a Digital Native she expressed that she felt like she grew up in parallel with the development of so many technologies. She paused after that thought and continued on that she felt like she also adapted to the language of technology and she had been able to use it appropriately in and out of the classroom. In fact, by the time she got to college, she used her computer every day, all day. She explained, "When I wasn't on it for school work and typing papers or, you know, going online to do assignments for classes, I was constantly on it for like Facebook because it was really popular. So I feel like even if I was just sitting, watching TV, I was on my Facebook, too." Lori admitted, in a matter-of-fact tone that she was constantly multitasking, moving between actions on her computer or cell phone. By the time she progressed through her undergraduate education and reached her senior year, her use of her laptop had changed.

During her freshmen year, Lori's extensive use of her laptop was driven by the novelty of having her first computer, especially one that was exclusively hers since she had to share a computer with her brother at home. When she reached her senior year in college, that sense of novelty had diminished, she was using the laptop for mainly educational tasks, and her smart phone played a larger role in her social networking and multitasking. Lori paused and explained how her coursework guided the educational use of her laptop, "I had a couple classes that were hybrid, so half of the course was online and that required me to be online for those class times. And then there was like, in some of my classes, online discussions posts so there were more online assignments my senior year." In some of her courses she had to collaborate with peers to create video projects with Apple's iMovie, presentations with Microsoft PowerPoint, or papers written online in Google Documents.

Lori proudly spoke about how she assumed a leadership role with her peers, teaching

them how to use different technology tools because, "I have always been very like, I love technology so I'm always taking the time to figure out how to do things. So I feel like when I did have projects with my peers, I was always taking the leadership role on that." She was also quick follow up her thoughts on leadership and point out that her peers asked how to do things, "Most of my peers would ask me how to show them how to do things rather than to ask me to do it for them. Like how to set up a Google doc. I showed them how to do that rather than just doing it myself." Lori felt that this was in part, because of the leadership role she assumed and because of her high level of digital literacy.

> Lori explained her digital literacy skills further:
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> I feel like I am extremely effective when it comes to trying to find things on the computer, on the Internet. I'm very aware of how to search for things on the Internet. I have a question I'm looking for or something that I'm researching about, I feel like I have a lot of knowledge on how to find different information about it. And when it comes to like making things on the computer, like we have been doing that.

Lori attributed some of her digital literacy knowledge to how her university classes required her to create digital storytelling videos with iMovie or write papers collaboratively with peers using Google Documents. Equally important to Lori was her personal drive to explore technology and learn it for her own benefit, even if it was means to multitask for personal and academic tasks.

Lori described herself as "constantly multitasking" on her smart phone or laptop to complete several tasks or for simply having a two conversations at once; one with a person in front of her and the other with someone via text messaging. She felt like she was always going back and forth between two tasks and this type of communication was the new normal for her

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and most of her peers. Lori explored this thought, "A lot of times, it's just as simple as, you know, having a texting conversation when I could be doing something for class on my computer or I could be writing emails on a computer. You know, those two separate things are still going on at the same time." Included in her multitasking was staying connected to personal social media sites like Facebook and Instagram. But she made it clear that social media was used exclusively for staying connected for personal relationship purposes, not to communicate for academic classes or for professional social media sites like LinkedIn. On the other hand during the two hybrid classes she completed during her undergraduate education, which had online assignments and discussion board interaction requirements, Lori readily admitted to only doing what was required of her and nothing more. She was quick to point out that she always completed the assignments on time and posted the required number of responses to classmate discussion board posts, but "never went above and beyond." Lori would read enough posts to pick the three she would respond to, but did not go out of her way to read every single person's post.

Internship Experience. Before she began the internship year experience, Lori expected to use video conferencing technology every Friday in her classes to "Skype in" and engage in the activities of the courses. She used the term "Skype" in this context as a generic term for video conferencing, though the equipment being used was a Polycom room-based system. Lori also assumed that she would not learn as much in the distance learning setting, "I guess I could honestly say that I really didn't expect to learn as much as I would if I was in Middleville just because I know how I can be distracted and, you know, just sitting and watching something on a screen rather than being there and being forced to interact and participate, I kind of expected that." Even at the time of the interview for this study, which was near the end of the teaching

internship year, Lori spoke of her discomfort with distance learning technology, though she experienced it during both semesters for nine hours each Friday. In a confident voice she explained that her preferred delivery method for college courses was the hybrid model, partly online and partly face-to-face, but for the all important internship year, she actually would have preferred and would have been more comfortable in a face-to-face classroom situation.

Curious about her preference for the hybrid model of courses, I asked Lori to explain her thoughts further in light of her admitted comfort level with the face-to-face course context for the internship year.

She explained more about the hybrid model:

It is really great for college students because it give them the opportunity to take away what, you know, the content of the class. Like being there in person and being able to interact with the instructors, but also having that free time to complete assignments on their own and from wherever that may be because college can get very hectic and with scheduling purposes, it can get very busy. So I think that the hybrid situation really is kind of the best, the best scenario for learning.

Lori considered the internship year a pseudo-hybrid model year, combining face-to-face course meetings using the Polycom and completing some of her course work online in the university course management system. "Some classes, we had to go and sit in class and be a part of the Polycom and sometimes we would just have online classes and I actually really like that", Lori expressed, emphasizing later in the interview that she really had no desire to do completely

online classes and would not have done the internship year in Big Lake City had that been the model for the courses.

During the internship year, Lori and the other teaching interns in Big Lake City collaborated with each other on group projects using email and Google Documents, a technology that she was already familiar with from past courses during her undergraduate courses. She described a typical situation, "Well, we would use a Google Doc to have somewhere for us all to post our information and share it with each other so that way we could have it all in one space when we were putting together our presentation." Google Documents was also used to collaborate with her peers in Middleville on worksheets or other instructor led activities. In addition to the collaboration with Google Documents, during each weekly class meeting one of her classmates in Big Lake City would be connected to the teaching assistant in the Middleville classroom using the chat feature of Skype just in case they had any questions or problems with the video conferencing connection. She was never the one to make that connection on Skype, but if she had questions for the instructor, she would pass them along to the classmate communicating with the teaching assistant. If there ever were a moment where she felt comfortable enough to "chime in" and ask the question directly to the instructor using the Polycom video connection, Lori would speak up and ask it. However, those moments were few and far in between.

For the most part, she didn't feel it was really necessary to unmute the local microphone and interrupt the class proceedings in Middleville. She was quick to tell me that she only participated when they asked her, "Just because if there was like discussion going on in Middleville, sometimes it was hard to be…it was less motivating for me to participate in the conversation just because I felt like when we were just chiming in, we were kind of interrupting

the discussion. So that kind of prevented me from, you know, having any input at some times."

Her strong feeling that she and her classmates were interrupting and disturbing the class in

Middleville motivated Lori to communicate often with her instructors offline using email and

setting up individual meetings using Skype, a technology she felt more comfortable learning to

use because of past explorations of technology for hybrid classes and personal communication.

Lori felt certain the distance education technology shaped her internship experience by

planting her in a different experience than her peers in Middleville. It made it a little bit harder

for her to learn as much as she could've learned if she had been present in the Middleville

classroom. Lori explained further, saying, "It was just more like personal attention type things

that hindered me from learning as much as I could." That said she also felt like she still had the

opportunity to participate and learn from the courses and to do anything that the people in

Middleville were able to do.

Although she felt like she missed out on some of the personal attention, Lori also

admitted that she readily used the distance technology to not pay attention to lectures and

complete other tasks, like lesson plans or personal tasks like reading non-class email or surfing

the Internet, "We knew that if we were doing something in Middleville that wasn't an

assignment that we had to turn in, we didn't necessarily always discuss something if there

wasn't, if there wasn't gonna be a share out or if we weren't turning anything in." Not being

"there", not being visible all the time led Lori and her peers in Big Lake City to take advantage

of that situation to work on other items in their busy internship schedules.

When asked if the use of distance technology during the internship year would affect how

she might use something like Skype when she had her own classroom, Lori said that although

there was a downside to experiencing her teaching internship year with video conferencing

technology, she learned that using video conferencing could help her students learn, "I think that would be a really cool way to get kids out learning, and stay in the classroom at the same time." This idea was her biggest take away from participating and collaborating using distance learning technology for her internship year: while there are drawbacks, there are also opportunities in that unique setting.

Observations

Day One: Observations of synchronous classes were conducted over two full days at the high school in Big Lake City. Throughout the year, the schedule for the first group of students included a face-to-face class with a local instructor and the asynchronous class with the home institution. During the first semester, the order of the classes was scheduled for the asynchronous course to be conducted in the morning and the face-to-face course in the afternoon. At the semester turnover, the schedule flip-flopped. My observations were conducted during the second semester, so on day one, I arrived at the school at 11:20 am just as the face-to-face course was coming to conclusion. I quietly slipped into the room and placed my computer bag and personal belongings on the floor next to a couch centered on the wall that shares the hallway. As the first instructor concludes her conversation with the students I take notice of the surroundings, the number of students, and the mood of the room.

The students occupy leather, padded, wooden chairs, saddled up to a large rectangular table. There were additional chairs along opposite walls, some of which were occupied by students who did fit around the wooden table. From my position on the couch, four students had their backs to me, making it possible for me to see their computer screens. There were four students sitting on the opposite side of the table and three sitting outside the table area. All but one of the students was Caucasian. The non-Caucasian student was African American. At the

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end of the table to my right, there was a black, rectangular box that was the video conferencing codec, connected to a camera, microphone, speakers, and a video data projector. The image of the home site (the university) was projected on a portable screen set up approximately 6 feet from the end of the table. The image size on the screen was about four feet by five feet.

Once the asynchronous class begins at 11:40 am, I began to observe student participation and collaboration with the faculty member teaching the class from the home campus in Middleville. The instructor started the class asking questions about how their lead teaching had been progressing, for better or worse. During this instructor led conversation, most of the students had their faces looking at their laptop or smart phone screen. The majority had a laptop set up in front of them. On occasion they looked up from their screen, whether it was a laptop or smart phone and looked towards the screen showing the instructor. During one period of time, when one student is sharing a story about her teaching experience, another student, seated so I can see her laptop screen, is filling out an online form of some kind. The student talking about lead teaching is talking and looking towards the projector screen and back towards peers in class as well. Immediately following this exchange, a second student begins to share a story about learning with a student during a unit about the city of Big Lake City and she also looked between the projector screen and her peers in the room. Similar to the earlier observation, a student sitting directly in front of me with her screen in plain site was looking at Pinterest while her peer was sharing the story, but then almost seamlessly she started adding to the conversation, despite multitasking. Thirty-five minutes into the conversation, everyone sitting around the table had contributed to the conversation. So there was direct, and continuous conversation between the students around the table and the instructor in Middleville.

In contrast, the students on the outer edges of the room do not participate or collaborate the same way as those around the table. For example, there was one student that was in and out of falling asleep. In between dozing off, she looked at her smart phone, but then immediately dozed off again. She had not participated in the conversation and it is observed that neither had the other students sitting on the outer edges of the room. However, at one point a student seated in the furthest corner to the left of the camera raised her hand to participate in the conversation, but when another student around the table began to speak and the student with her hand raised was not recognized by the instructor to make a contribution, she lowered her hand and did not speak during this first part of the class. In addition, there was an informal feeling about the classroom environment, where students feel free to get up and walk around at any point during the class, including leaving the room to go to the restroom, throw away garbage, open a window, prop open a door to the hallway to create a cross breeze or even change their place in the room. After 45 minutes, this class conversation ended and there was a shift to a group project.

As instructed by the faculty member at the home site, the students broke off into five groups of two to three students to answer questions that they might hear in a job interview. This activity forces the students to move away from the large, rectangular table to other areas of the room. Some took their laptops with them and some did not. The question prompts are viewable on the projector screen for students to refer to throughout the exercise, shared from Middleville via the videoconferencing equipment screen sharing function. The group activity in the face-to-face setting had all the students participating and collaborating to answer the questions that the instructor had asked them to consider. As opposed to only the students around the table participating during the "lecture" part of the class meeting, when the instructor interrupted the activity with verbal clues to move on to the next question, the students respond to her in a timely

fashion, similar to an instructor in a face-to-face classroom. The students also followed the directions quite well and moved on when prompted. There appeared to be a very natural flow to this activity between the students and the instructor in Middleville. At the end of the group activity, students stayed in their areas scattered throughout the room instead of reconvening in their original seating positions. One group is in the far left corner by the door to the hallway. While one person in this group was reporting out, there was a group in the far right corner talking the entire time. The instructor at the home site appears to still hear the entire report out from the students, despite the other conversations going on in the room. She immediately responded, giving feedback with detailed options on how to improve the response in an actual interview situation. The student that reported out for the corner group was one of the students who sat around the table earlier in the class time and participated in the early conversation. The same students continued to talk off-camera when a second group was reporting out. This does not seem to faze the student speaking to the camera, for she kept talking in detail about her answer without pause or hesitation. As an observer in the room, I found it distracting, but she appeared to not be fazed by it. Finally, the group exercise had compelled those that hadn't talked yet to contribute to class, except the one person who was sleeping earlier. She did not communicate directly with the instructor, although she was in a conversation with the rest of her group during the activity, including sharing other items on her laptop with her peers while the instructor is gave some feedback about interviews, sharing a PDF about interviews via the videoconferencing system and talking about what is coming up after the break.

After the break, the participation and collaboration pattern stayed the same: Students sitting around the table actively engaging with the instructor and those on the edges staying quiet. The activity included watching a video through the videoconferencing system of a little

boy, approximately 5 or 6 years old, discussing the geography of a world globe with a male teacher. The volume of the video coming through the system kept fading in and out for the first few minutes, but once the instructor at Midwest State University adjusted the volume on her computer the audio stabilized and came through much more clear. In addition, to help the audio levels, the student sitting closest to the speakers turned up the volume. Even with the increase in volume, the students leaned towards the speakers at the end of the table, almost as if there was a slight tilt to the room. While the video was playing the students appear to be closely concentrating on what the boy was describing, occasionally laughing at the child's description of the oceans on the globe. Coinciding with this laughter, some of the students were looking at their laptops, but still reacting to the auditory cue from the audio track of the video. When the video was done playing, the instructor prompted for reactions about the video content and some of the students returned to looking at their laptops, while others keep their attention on the projector screen, staying engaged with the instructor by answering her questions. Again, those engaged were the same students that participated at the earlier points in the class and those not engaged were having side conversations off-camera or looking at their laptops or smart phones. The second day of observation had similar outcomes.

Day Two. Unlike the first observation group, the first class for this group began at 8:10 a.m. with a much smaller group of four students. The day of the observation is the last class meeting for the semester. Once they arrived, they took their place at the table, opened their laptops and prepared for class. They interacted with each other in normal conversation tones, but also hushed tones when there was lecture content coming through the video connection from the home site. When I arrived, only one of the students was there. The other three arrive anywhere from ten to fifteen minutes late. The students in this class were secondary social studies

education students, of which three were completing their year-long internship at this high school. The fourth intern was placed at an academy in a different area of the city. Three of the four students were African American and one was Caucasian; all are 22 years old. In the afternoon, they were joined by two more secondary education students, one a science major, the other an English language arts major. Both of them were Caucasian

Both the morning and afternoon classes did not connect to Middleville using the same room-based videoconference system as the class observed on day one, instead they connected with a desktop based software solution that used a laptop, web camera, and USB microphone to connect to Middleville. The laptop was connected to a visual projector to show Middleville on a projector screen, set approximately six to eight feet from the students, with an image size of about five feet by six feet. The students, sitting at two tables places side by side, created one long row. Two of them sat on classroom chairs with wheels and two on folding chairs. Each of them had a laptop; three Apple computers and one PC. In the afternoon, a second table was brought into the classroom to accommodate the two additional students. The table was placed behind the four students that were present for the morning class. The camera image of the students in Big Lake City had their faces semi-shrouded in darkness because of the windows in the background of the frame. The iris on the web camera compensates for the brightness behind them by closing down, hence the reason for the darker image. The image of Middleville students was also a bit darker in the video image because of the windows behind the students in the image frame of the camera in the room at the high school. The students directly in front of the camera were clear and recognizable; the students off to the left and back of the room were not as recognizable.

The instructors at Middleville were almost always off camera, moving about the room as they talk to the home site students. There were 25 or more students in the technology classroom

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and at the beginning of the class. Middleville had considerable difficulty hearing the audio from the Big Lake City students so assistance was needed from the technical help desk in the education college. After what seemed to be fifteen to twenty minutes, the equipment was fixed and Middleville instructors and students could hear the Big Lake City students.

As the morning class proceeded, there was a group activity for the students to complete and after a designated amount of time the groups were to share out to the collective class the results of the activity. The female student spoke first amongst the Big Lake City group and in louder than "normal" conversation level in the direction of the microphone. She began sharing, without an unnatural delay after being prompted by the instructor at the home site. I observed during her report that the instructor in Middleville wrote down her report on a whiteboard for the benefit of the local students. Immediately after this report, a second student contributed to the report and like the first student, spoke louder than "normal."

After a short break, the instructor initiated another group activity that included the group in Middleville getting Ziplock bags with artifacts to do role-playing. Since the bags were not available to the Big Lake City students, they were directed by the instructor to a website to do an online activity with specific instructions on what outcomes he'd like for them to report out at the end of the 30 minute time period. As the students navigated to the website, I observed a conversation between three of the interns about what leftovers they brought for lunch and another side conversation immediately afterwards between two students about another side topic that I could barely hear, but no discussion about the group activity had commenced up to that point. As each student went through the activity on the website, side conversations continued. I wondered if these side conversations would happen in a face-to-face classroom? Perhaps, but since the activity is so different from the one assigned to the students in Middleville, it was hard

to make that comparison. However, throughout the activity I observed the students in Middleville on the projector screen working on their simulation, getting up and walking around with papers in their hands while the students in Big Lake City remain seating, glued to their computers as they completed the web site simulation. There appeared to be no hesitation going through the simulation on the website. No one stopped to ask for direction from the instructors in Middleville. At one point during the task a side conversation commenced between two of the students about the task, and at the same time, one of the students started texting on his phone. This did not seem to faze the other student; the conversation continued on without hesitation. When the students finished the simulation, they had a short discussion about the results and also looked at other website on their laptops, including accessing their email. It is important to note that during the entire exercise, both the Middleville microphone and Big Lake City classroom microphone were muted so neither side could hear the other. When the 30-minute time period was up, the entire class came back together for a discussion between the two sites.

Big Lake City students were eventually asked by the instructor if they were done with the activity and in unison, they loudly reply, "Yes!" Then James, the student that helped navigate the earlier audio problems with the equipment, took control of the microphone and turned down the volume of the audio from Middleville as the student there began their reports. During the next few minutes, the Big Lake City students gazed from their laptops to the projector screen, and back again several times dispersed with glances at printed materials next to them. At one point, William had his eyes closed for a couple minutes as the reports and conversation continued between the Middleville students and the instructors. The ability of the Big Lake City students to control the volume of the audio received was an interesting power over content reception and participation. And their ability to step away from participation and collaboration without notice

was obvious when a cell phone rang, William answered the call, handed the phone to Jessica and she stepped out of range of the microphone and camera to take the call, full well knowing that the microphone was now muted.

When the Big Lake City students were prompted for their reaction to their activity 20 minutes later, James was the spokesperson and his responses to the instructor were timely and without hesitation through the videoconference medium. This was also true when William chirped in with an additional thought to the group answers and he got an immediate round of laughter from the Middleville students and instructor. Once given the opportunity, the Big Lake City students participated freely with their peers in Middleville. However, collaboration was within the group in the room, not with their peers on the other side of the connection and this was natural considering that they were put to two different tasks. That being said, there was no cross-examination between sites, only dictated reports. The only sign of collaboration was at the end of the first class when a student worker in the college technology office paid a visit to Middleville classroom to take a group picture of all the interns for convocation and everyone in the class gathered around the television monitor that showed the students in Big Lake City so that the picture would include them.

After a lunch break, the two additional secondary interns joined the group for the afternoon class, taught by a different instructor and teaching assistant. This class was a completely different setting in Middleville: not taught in a classroom and no students. It was taught from a small conference room with the capacity to hold a maximum of five or six participants sitting around a small table. The teaching assistant was directly facing the camera and the instructor was viewed from the side, looking at her laptop, not the students through the camera, although she

occasionally turned her head to directly speak to the students when giving them task instructions or prompting them for reflection.

The first task of the session was for the Big Lake City students to work on their convocation video project, which was a collaborative project. Given their task, the students muted their microphone and began discussing the project goals and a plan to complete it. During this conversation, I observed the instructor watching them through her camera view in Middleville even though she could not hear what they are saying. The students seemed to be ignoring her presence on the screen. The collaboration between the students in this face-to-face setting was interesting; a heated, yet friendly debate concerning what their project should be about, how to structure it and what formats, and what end product they should produce. They were almost agreeing and disagreeing at the same time. After the debate, the students agreed to spend 10 minutes planning their individual parts of the project. During this time, one student went to the other side of the room with his laptop and the remaining 5 worked individually on their laptops, seated in the same spots. I observed one student using the software program Notes on her Mac, another using Word, and one had email open. At a random moment, William plays a "news-like" theme song from his laptop and asks, "Like this?" referring to the opening music for their compiled skit, but he gets no response. The student on his PC that had mail open then starts randomly opening other applications while the others work. There was no participation by the Middleville instructor during the time they worked independently. In fact, the entire class session was very fractured and unstructured with very little interaction between the students and the instructor. As soon as they got done with one assignment, they were instructed to do another one.

There was no fretting about creating media to share at their convocation; every student appeared comfortable with the idea of creating original video media and sharing it with the

member of the group who volunteered to edit each individual piece together into one video. The only technology struggle observed was the inability of Jessica to recall how to open the comments tool in a Microsoft Word document. At the end of class, the microphones were unmuted, pleasantries were exchanged and each party signed off for the semester.

Conclusion

In this chapter I told the stories of the technology background of the teaching interns during their early education, adolescent, and university years and their experience with technology during the internship year and what the interns learned about themselves and their relationship with technology. In addition, observational data from two full days at the high school in Big Lake City was summarized from field notes. In the next chapter, I discuss the findings of the case study in relation to the research questions.

Chapter Five: Research Findings

In this chapter I will discuss the results of using the Unified Theory of Acceptance and Use of Technology (UTAUT) to analyze the coded transcripts of the interviews and the conclusions that were generated from using UTAUT for this qualitative study. A summary about the study findings in relation to the research questions follows, including final thoughts about the significance of the study for faculty in teacher preparation programs and what we can tell about students and distance technology enhanced learning.

To analyze the data, the Unified Theory of Acceptance and Use of Technology (UTAUT) was applied, examining the interviews for each of the four main factors that influence intention and usage of technology: Performance expectancy, Effort expectancy, Facilitating conditions, and Social influence. Each main factor is defined as:

- Social influence – "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451).

- Performance expectancy - "the degree to which an individual believes that using the system will help him or her to attain gains in job performance (Venkatesh et al., 2003, p. 447).

- Effort expectance – "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450).

- Facilitating conditions – "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003, p. 453).

Venkatesh et al. (2003) also examined other moderating factors as part of their original study, including "gender", "age", "experience", and "voluntariness of use" that may influence the four main factors. For the purposes of this study, "gender", "age", and "voluntariness of use" were not considered as part of the analysis due to the small sample size and single case study design within a unique program. However, pre-internship "experience" with technology was examined as a moderating influence on all four main factors.

As is shown in what follows each construct had varying levels of influence on the intention and use of technology. "Social influence" had an insignificant influence and "performance expectancy" had a limited influence on the technology experience of the pre-service teaching interns. "Effort expectancy" which is the degree of ease associated with use of the technology had considerable influence on the intention and use of technology by the interns and "facilitating conditions," which is the degree that an individual believes that an organizational infrastructure exists to support them, had a significant influence on the intention and use of technology by the interns.

Pre-Service Digital Natives, Distance Education, and UTAUT

In the UTAUT model, each of the four main constructs is represented by statements such as: (1) "I would find the system useful in my job" (Performance expectancy), (2) "It would be easy for me to become skillful at using the system" (Effort expectancy), (3) "I have the knowledge necessary to use the system" (Facilitating conditions), and (4) "People who are important think that I should use the system" (Social influence). The statements from the model helped define the four main constructs and were included in the use of UTAUT for this study.

In this section I apply UTAUT to the interview data by examining each of the four main constructs (performance expectancy, effort expectancy, facilitating conditions, and social influence) and explore how the representative statements frame (or do not frame) the pre-service teacher experience in each of the main constructs. Similar to Gruzd, Staves, and Wilk (2012), I use the framing statements as a guide to applying the constructs to the interview data. In addition, I explore the role of previous experience as a variable and the level of influence of each main construct on the unique internship experience of the pre-service teachers. Whereas Gruzd et al (2012) defined "system" as "use of social media", for the purposes of this study "system" is defined as "technology used to enhance distance learning", as the internship experience is facilitated by more than one type and kind of technology for participation and collaboration and the interns backgrounds with technology varied widely. Figure 1 visualizes the moderating factor that pre-internship experience had on each UTAUT construct and in turn, the varying influence that each construct had on the intern adoption and use of technology.

Figure 1 - UTAUT Constructs & Moderating Factors
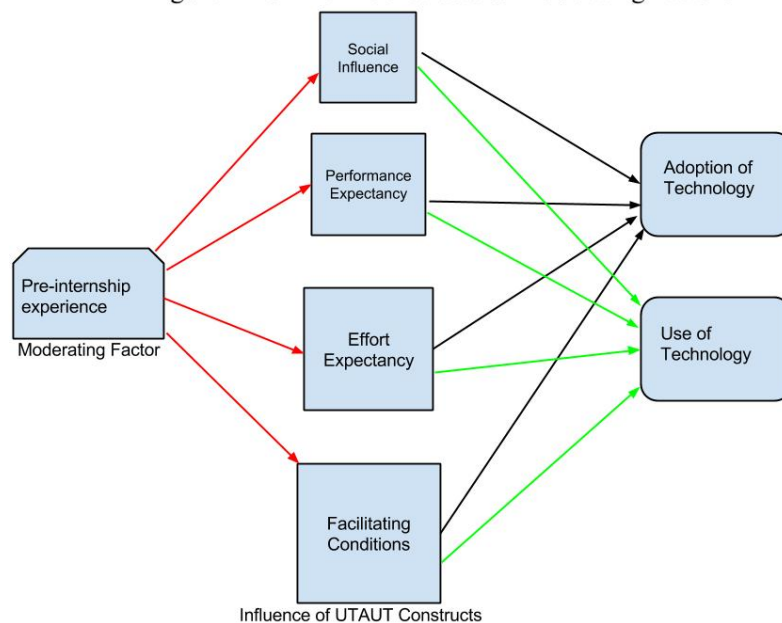
Social influence. This construct is represented by the statements: (1) "People who influence my behavior think that I should use the system" and (2) "People who are important to me think that I should use the system." Based on the analysis of the interview data, only two of the Digital Native pre-service interns referenced "social influence", whether from instructors or peers, as a reason to learn or use technology. It is important to point out that in the case of Spencer and James, both interns rebuffed "social influence" and chose to not use, or limit use of a technology that their peers or loved ones had adopted. For example, Spencer purposely limited his use of apps on his smart phone because of his strong feelings about how distracted people got by the use of their smart phone for so many tasks and entertainment purposes. His peers did not have as much influence on him to use his smart phone as they did to stay connected using social media. In the instance, the "social influence" on his behavior by people important to him was evident as he immersed himself in social media use throughout his undergraduate education and throughout the internship year. James resisted the use of social media and blogging despite an abundance of use by his friends and fiancé.

He stated:

I'd say that more of my friends are probably more involved in social media, as far as posting on social media than I am…My fiancé gets upset because she's like, you just sit there and watch. I don't think, I mean, it's one of those things where it's like Twitter is kinda funny, it's like I don't think everything I have to say is that important.

The above quote is a good example of how not every Digital Native is immersed in every type of technology as a result of having grown up with technology.

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Overall, I found that "social influence" had an insignificant role in previous technology experience and on the unique internship experience of the pre-service teachers. Furthermore, similar to Gruzd et al. (2012), social influence may have a stronger effect on "behavioral intention" rather than on the actually use of technology. For example, an intern may start to use a technology because it is required of them for class or a friend suggests it, but they may not continue to use it once the task is done or the initial nuance of the technology wears off.

Performance expectancy. In the UTAUT model, statements that help frame the application of technology acceptance define each of the main constructs. For purposes of this study, performance expectancy is represented by the statements: (1) "I would find the system useful in my job", (2) "Using the system enables me to accomplish tasks more quickly", and (3) "Using the system increases my productivity." Based on the analysis of the interview data, performance expectancy was a limited influence on the technology use and experience of the Digital Native pre-service interns. Ten instances that fit the performance expectancy category were generated from the coding process. Of the statements above, Statement 1 and Statement 2 had the most instances of influence on the technology experience of the interns. The top benefit of technology experience before and during the internship year included ability to transfer the experience to their current and future jobs. William described how he could use his technology experience to help him teach during his internship year and in his future classrooms. Spencer had strong feelings about his technology experience and how important it would be not only for his future jobs, but also for all students. For example, "I think that the exposure to technology is important for all students especially now…I think that if students aren't exposed to it at a young age, they'll be at a great disadvantage when they go on to higher education, or if they go on into the workforce." In addition to Spencer, Emily had strong sense of responsibility to build on her

technology experience use to immerse future students in her own classroom in learning experiences through distance education technology.

Statement 2, "Using the system enables me to accomplish tasks more quickly," was represented in the content analysis by the Digital Native pre-service interns expressions of agility and quickness of their Internet searches, their ability to use technology to multitask while participating in synchronous distance education classes, and how much easier life was to them when they became tech savvy with their devices. In this case, becoming tech savvy for the purposes of their work meant accomplishing tasks more quickly and multitasking with technology was viewed as "normal." Emily expressed the normalness of her multitasking, "So I was always multitasking through both technologies. So on my MacBook I was lesson planning, going back to the presentation, then lesson planning, going back to the presentation. So, and I was Skyping at the same time….I'm always doing something else at the same time because there's just a lot to be done." Using the Internet to quickly complete coursework and lesson planning was a technology experience that Lori highlighted in her thoughts about digital literacy, "I feel like I am extremely effective when it comes to trying to find things on the computer, on the Internet. I'm very aware of how to search for things on the Internet." Lori also expressed how her technology experience fed her habit of "constantly multitasking" to accomplish many things at once and quickly. However, the content analysis also revealed that only one of the interns mentioned that their technology experience influenced an increase in productivity, as defined in Statement 3.

Overall, the data confirmed that performance expectancy was a limited influence on the technology use and experience of the Digital Native pre-service interns. While there were

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certainly examples given in the interviews illustrating some influence, performance expectancy had limited importantance to the pre-service interns than other main constructs.

Effort Expectancy. This construct is represented by the statements: (1) My interaction with the system would be clear and understandable", (2) It would be easy for me to become skillful at using the system", (3) "I would find the system easy to use", and (4) Learning to operate the system is easy for me." Based on the analysis of the interview data, effort expectancy had considerable influence on the technology use and experience of the Digital Native pre-service interns. Thirty-four instances that fit the effort expectancy category were generated from the coding process. Unlike Gruzd et al (2012), all four statements were evaluated separately although minute differences exist between variations of ease of use, learnability, and understanding. This approach to the analysis revealed that minor differences in the perception of "easy to use" affected how the interns viewed their ability to use the video conferencing technology, despite some strong backgrounds with technology experience. Of the four statements, Statement 3, "I would find the system easy to use", had the most influence on the technology experience of the teaching interns. There was a perception that their technology experience, including through the end of their undergraduate education, would prepare them to use all technology during the internship year.

For example, William said:

It all helped. Everything I learned in high school, learned as I've learned more technologies influenced me in doing the coursework and collaborating more effectively with my peers because of Google drive and knowing how to use that and things like that, Google documents, all that kinda stuff. So everything I've learned has all benefited me in my coursework this year

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Equally influential were Statement 1 and Statement 2 with regards to clear and understandable interaction with technology during the internship year and how easy it to would be for the interns to become skillful at using the technology. Statements 1 and 2 were also supported by the technology background experiences of the teaching interns. For example, William felt that because of his growth in digital literacy throughout his K-12 and undergraduate education, he would feel comfortable using the video conferencing technology to challenge a comment by a peer on the campus of Midwest State University. In addition, James felt that it would be easy for him to figure out the technology because in the past he'd been able to "figure out all the function" of new technology like his phone, gaming system, or for a class he was able to create a Wiki page and "use it in an effective way." However, there were concerns by some of the interns that although the video conferencing appeared to be easy to use and their interaction with it was understandable, it was not the preferred or best way to facilitate learning. In this sense, the influence of the technology created uneasiness and learnability of the video conferencing technology became hard.

This difficulty with the learnability of the video conferencing technology is reflected in the least amount of influence of Statement 4 on the pre-service teaching interns technology experience. One of the interns provided this perspective, reflecting that using collaborative functions in Microsoft Word, using Skype, and Google Drive felt "normal" and "natural" to her, but using the Polycom video conferencing equipment was neither easy nor comfortable. Despite their technology background, five of the seven interns found the video conferencing system not easy to use and they relied on James and Emily as the technology helpers.

In summary, "effort expectancy" was defined by the perception of how easy it was for the pre-service teaching interns to learn to use the video conferencing technology and how previous

experience influenced that sense of easiness. For most of the technology used during the internship year, like Google Drive, Desire2Learn, or Skype, the interns validated the influence of Statement 1, Statement 2, and Statement 3. However, there was mixed influence of Statement 4, the learnability of the Polycom video conferencing system did not feel "normal" to most of the interns and they often felt uncomfortable using it or troubleshooting issues because it was "not their own."

Facilitating Conditions. Applying the UTAUT theory, the "facilitating conditions" construct is distinguished by the following statements: (1) "I have the resources necessary to use the system", (2) "I have the knowledge necessary to use the system", (3) "A specific person (or group) is available for assistance with system difficulties", and (4) "The system is not compatible with other systems I use". Based on the analysis of the interview data, "facilitating conditions" had a significant influence on the technology use and experience of the Digital Native pre-service interns. Forty-three instances that fit the "facilitating conditions" category were generated from the coding process. The exploration of "facilitating conditions" for its influence on technology use and adoption within the backgrounds and internship experiences revealed that the resources were available for the interns to use technology, they had the knowledge necessary to use technology, but not all the technology was viewed as compatible with their knowledge of other systems that they used and assistance was not always available when they had difficulties, however they acted as support for each other.

Overwhelmingly, the participants provided examples from their background and internship experience that they had the resources (Statement 1) and knowledge (Statement 2) to use the technology. Their knowledge and the availability of resources facilitated the ability to work with their peers in the Big Lake City cohort and with their peers at Midwest State

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University. Resources were not limited to the technology used to collaborate and participate online, but also included the video conferencing technology used for classes despite the uncomfortable feeling of using it to facilitate class conversation. Although the video conferencing technology tended to emphasize the physical distance between the interns and their faculty and peers, it still offered some sense of social presence in the learning process. The knowledge to use the technology was derived from their background with learning technology, in particular their undergraduate courses, and their ability to use that experience as a building block for what they would use in the internship year. For example, Jessica expressed that because she already knew how to download and install programs, share videos, and download photos and music, during the internship year, technology made "it really easy to do several things done at once." She also talked about how one of her teacher education instructors during her undergraduate senior year, "did a really good job of trying to infuse technology into the classroom. So when we had to present different materials, he would always encourage us to be a little more creative with using technology and how we present it."

When assessing "facilitating conditions" another factor that influenced the use of technology was a sense of a lack of effective of use of the resources by the faculty. In this study, resources were any technology system used to conduct coursework.

William expressed in frustration:

We were able to just not participate. Sit there, go on Facebook, YouTube, have a conversation here and there, maybe get up and leave and go to the bathroom or walk the hallways…we were able to things that would not have been done if you were in the classroom.

Spencer lamented that the lack of facilitation by the faculty to use the video conferencing technology to engage him, limited his use of the technology to participate. For example, "I know that's wrong but at times it feels like we are just sitting there and staring at space." He felt uncomfortable jumping into a technology-mediated conversation without engagement by the instructor. Other interns expressed that their participation in smaller group activities using technology resources such as Skype or Google Hangouts were more beneficial than the large group course meetings through the video conferencing system.

Finally, the feeling that the Polycom video conferencing system was not compatible (Statement 4) with the previous experience with video technology like Skype or Apple's FaceTime had an influence on the pre-service teaching interns experience during the year. Interns Jessica and William were confident their background with technology would help them most new technology that they would be required to use during the internship year, however the video conferencing system was so different they did not want to be the one to help set it up or troubleshoot any problems. Statement 3, "A specific person (or group) is available for assistance with system difficulties" had the least amount of influence on "facilitating conditions" for the interns experience with technology. Only Emily spoke about how she used Skype to connect to the teaching assistant in the Middleville classroom to communicate about technology difficulties and ask for help from the support staff at Midwest State University.

In sum, "facilitating conditions" was a construct that had significant influence on the experience of the Digital Native pre-service teachers during the internship year. Resources (Statement 1) and knowledge (Statement 2) were important to using the technology (system) during the internship year to collaborate and participate. Assistance with technology difficulties

and technology compatibility with previous experience, while not insignificant, were not as influential on the experience of the Digital Native teaching interns.

Discussion

Overall, I found that the UTAUT constructs were a useful framework for studying the role of previous technology experience as a variable and the level of influence of each main construct on the unique internship experience of the Digital Native pre-service teachers. Although its use was limited by the small sample therefore negating the ability to examine the three moderating factors of "gender", "age", and "voluntariness of use", UTAUT provided an important framework for understanding technology use by Digital Natives, how they perceive technology learnability, and how prior knowledge and resources play a part in their adoption and acceptance of new technology.

For the small sample in the case study, "performance expectancy" had a limited influence on the technology use and experience of the Digital Native pre-service interns. The top benefit of technology experience before and during the internship year included ability to transfer the experience to their current and future jobs. While there were certainly examples given in the interviews illustrating some influence, performance expectancy was significantly less important to the pre-service interns than other main constructs.

In the case of "effort expectancy", this construct had a considerable influence on the technology use and experience of the Digital Native pre-service interns. Ease of use, learnability, and becoming skillful at using a particular technology were influential on the effort pre-service interns put forth to learn and use technology. This was reflected in how they participated (or did not participate) and collaborated with different technology during the internship year. Familiar and easy to use technology (Facebook, Skype or Google Drive) was used to actively participate

and collaborate with instructors or peers. But technology deemed too hard to learn like the

Polycom video conferencing system, was minimally used to participate without prompting from

the instructors at Midwest State University. In contrast, the pre-service interns knew how to use

the discussion boards in the course management system from previous online course

assignments, but chose to only put forth a minimal effort. In sum, the use of technology by

Digital Native pre-service teachers in a unique program is moderated by how easy it is to learn

and become skillful at and if they have the previous knowledge to use the technology

successfully.

The exploration of "facilitating conditions" for its influence on technology use and

adoption within the backgrounds and internship experiences revealed that this construct had a

significant influence on the technology adoption and use by Digital Natives. In most situations,

the resources were available for the interns to use technology and they had the knowledge

necessary to use technology, but not all the technology was viewed as compatible with their

knowledge of other systems and assistance was not always available when they had difficulties.

Their previous knowledge and the availability of resources facilitated the ability to work with

their peers in the Big Lake City cohort and with their peers at Midwest State University. To

summarize, "facilitating conditions" was the most significant construct to influence the

experience of the Digital Native pre-service teachers during the internship year. Resources and

knowledge were important to using the technology (system) during the internship year to

collaborate and participate. Assistance with technology difficulties and technology compatibility

with previous experiences, while not insignificant, were not as influential on the experience of

the Digital Native teaching interns.

Finally, "social influence" was an insignificant influence on the technology use and

experience of the Digital Native pre-service interns. Only two of the Digital Native pre-service interns characterized the statements associated with "social influence", whether from instructors or peers, as a reason to learn or use technology. Similar to Gruzd et al. (2012), I found that social influence may have a stronger effect on "behavioral intention" rather than on the actually use of technology. The limited examples found in the interview analysis support this conclusion.

Conclusions

This study was based on semi-structured interviews with Digital Native pre-service teaching interns in a unique urban education program that used distance education technology for communication and information dissemination during a year-long teaching apprenticeship. The participants provided me with an abundance of information on their history and background with technology in their childhood, K-12 settings, and undergraduate education. Additionally, the participants shared with me their experience with distance learning technology during the apprenticeship year and how it shaped their internship experience. Also, this study tried to build on the work of Gruzd et al. (2012), which was the first study that used UTAUT for qualitative semi-structured interview research for technology acceptance and use. Below are the summaries of the findings related to the four research questions set forth at the beginning of this research.

Question 1: What sense do Digital Native pre-service teaching interns make of their experience with technology and its affect on their growth throughout their education? As highlighted in the stories of the interns, each one of them had a varying degree of exposure to technology in their K-12 school settings and in their family home. Five of the seven participants had moderate to high exposure to technology in the home or at school, while the remaining two had minimal exposure until high school or until they began their undergraduate career at Midwest State University. Varied experiences resulted in different perceptions of fitting into the

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Digital Native stereotype. Some of the interns felt that they absolutely fit the definition of being a Digital Native, one intern felt that she grew into the image of a Digital Native, and another felt like he wasn't a Digital Native at all, but that the generation that came after him fit the description more concisely. While one of the interns proudly spoke about not being "controlled" by technology and preferring to be "old fashioned", others readily agreed that they fit the definition of a Digital Native with statements like "It fits spot on", "I think yes", and "I mean not everything but for the most part yes."

Varied experiences with technology throughout their childhood and adolescence also affected the pre-service teaching interns perception of their growth throughout their education. Two of the interns that had technology rich experiences growing up had the least sense of growth in their technology use in their education. While it was true that they learned to use new technology at points in their education, they were just layering on new tools to use and not learning a completely new technology. The two interns that had the least amount of exposure to technology growing up felt that they had the most growth in technology use in their education. Irrespective of exposure to technology growing up, "social influence" had very little influence on the pre-service teaching interns' adoption and use of technology. While there were mentions of learning from peers or using technology like text messaging to communicate with friends in middle school and high school, direct references to using technology because people who influence their behavior thought they should use the technology were absent. Although it is worth considering that at those points in their life, a cell phone was becoming as ubiquitous as other communication and entertainment items like a television or gaming system. Overall though, all of the interns expressed that technology played a part in their education, at the very least, during their undergraduate years, and was part of their growth as a student. In addition, by

the time they were interviewed for this study, most of the interns expressed a strong sense of how important it would be for them as future teachers to help their students learn technology and with technology.

Question 2: What role does being a "Digital Native" play in the use of technology by pre-service teachers? Building on the narrative in the discussion of question one, it is hard to say that being a "Digital Native" plays a role in the use of technology by the pre-service teachers. If this generation is defined by specific characteristics and high expectation of how and what technology should be used for teaching and learning, then the small sample of participants in this study lies outside the definition. While it is true that most of the interns had some common technology in their homes as children and adolescence, they were not "surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age" (Prensky, 2001a, p. 1). That said, by the time each of the interns reached their freshmen year of college they had some exposure to computers and owned a cell phone for a minimum of 4 years, giving them a base of knowledge to grow upon for future technology experiences.

Use of technology by the pre-service interns was driven more by coursework, curiosity, and a need to communicate with family and friends; more a sign of the overall changing means of communication in society as a whole than their "Native-ness." Certainly, the base of exposure to computers and other technology in their formative years provided them with a basic level of comfort with technology, enabling them to learn new tools without starting over each time. But how much of that technology adoption and use is in line with the influence of the "effort expectancy" construct of UTAUT? If new technology tools were easy for them to become skillful at using or learning the technology was easy for them, then their effort and previous

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experience moderated their adoption and use. Yet, some of the interns admitted that they need some kind of scaffolding or peer instruction before mastering a new technology. It wasn't just "native" for them to learn it. Yet other interns said that using technology was an everyday part of their lives once they learned how to use it and adding a new device like an iPhone or participating in a new social media website was easy to them; they build on what they had previously learned or used the Internet or friends to help with instruction.

During the internship year, the interns used familiar technology like the course management system, Google Drive, and Skype without extra scaffolding. However, the Polycom videoconferencing system was viewed as too hard to use or so unfamiliar that all but two of the interns preferred to not operate it. Applying the UTAUT model, the interns opposition to learning to use the Polycom system could mean that they did not think this particular technology would be useful in their job (performance expectancy), easy to use (effort expectancy), or they did not have the knowledge necessary to use the system (facilitating conditions). A few of the interns expressed that since they did not own the technology and that it was owned by the university, they were afraid to "screw it up" or break the equipment although they were provided with an orientation to the equipment at the beginning of the academic year. So their knowledge base of technology and experience as Digital Natives up to that point in their academic career was not enough to overcome their qualms about learning this particular technology.

Question 3: How do Digital Native pre-service teaching interns participate and collaborate in asynchronous and synchronous distance education? Overall, the pre-service teaching interns participated in a reduced capacity than their normal classroom habits in the asynchronous and synchronous distance education formats. The pattern of reduced participation in asynchronous activities such as discussion boards was not outside their previous participation

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behaviors in online courses that required posting and responding to fellow students in a course management discussion board. Every intern that spoke about taking online courses during their undergraduate education recalled that they "did what they had to do and nothing more" and just wanted to get the required posting completed. The most effort and interaction that was reported for asynchronous activities was in the context of a Facebook group that was set up by the students in the course, not the instructor. The Facebook group served as a platform for coursework discussion and as a place for peer communication about social activities as well. In addition to Facebook, the pre-service teaching interns used other familiar Web 2.0 tools such as Google Drive to actively participate and collaborate in asynchronous coursework. Skype was used to participate in one-on-one meetings with their instructors and to communicate with teaching assistants or peers during synchronous class meetings. The use of familiar technology to participate and collaborate with peers and faculty supports the influence of the "effort expectancy" and "facilitating conditions" constructs of UTAUT on the intention and usage of technology. Google Drive, Skype, and Facebook were technology systems that the teaching interns had the knowledge necessary to use, had the resources to use, and learnability was clear and understandable based on previous experience before the apprenticeship year in Midwest State University courses and for personal communication. Although "performance expectancy" had a limited influence on the adoption and use of technology by the interns, using Web 2.0 tools such as those mentioned above, was instrumental in the interns' perceived ability to multitask and accomplish tasks more quickly.

When measuring how much the Digital Native pre-service teaching interns participated during the synchronous class meetings mediated by the Polycom video conferencing system there was a consistent response from the interns that they did not participate nearly as much as

they would have in a traditional face-to-face class. They talked about a "barrier", "not wanting to interrupt", "being distracted", "it's hard to get good feedback", "it was awkward", and "it kinda seems impersonal to sometimes challenge certain things when you're not there in person." And while they felt that the video conferencing setting created a barrier to their participation, they understood the technology enough to use it to their advantage to disengage from class because there wasn't an instructor present in Big Lake City to keep them on task or prompt them for participation. For example, every intern talked about using the time in class to get other work done for their classroom preparation, class assignments, browse social media sites, and sports web sites. During my observation of the class sessions, most of this behavior was verified. The interns would mute the Polycom microphone to talk amongst each other, get up to walk in and out of the room, take phone calls, and text message. When directly addressed by the instructors at Midwest State University they would respond, but actively participating without prompts was only observed once. In sum, the pre-service teaching interns participated and collaborated when required to do so with familiar technology, but minimally participated in asynchronous discussion boards and synchronous video conferencing sessions.

Question 4: What long-term uses might there be for distance learning in teacher education programs? This study has revealed teacher education programs focus on students' actual acceptance and use of technology needs a narrower focus. Technology enhanced learning, such as distance learning, should be introduced and implemented like all other new concepts, with scaffolding and supports to build familiarity, understanding, and knowledge of the pedagogical applications. Digital Natives, like generations before them, require a solid foundation to become digitally literate and effectively use technology in their learning process and integrate technology in the learning process of the students they will teach in their own

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classrooms. The application of distance education technology to pre-service teachers'

apprenticeship experience requires intentional efforts on the part of instructors and teacher

education program coordinators to recognize the barriers to social presence created by distance

technology. The limited faculty presence in the intern narratives about their year-long experience

should prompt some concern to program directors. Is distance learning technology effective in

this context at providing the teaching interns the structure they need to succeed in their graduate

level coursework about teaching practice and methodology? Perhaps it is not if the expectation of

the program is to provide pre-service teachers with the foundation to be "teachers who teach for

understanding, who will reach diverse bodies of students, who will be thoughtful and skilled

about linking subject matter in a responsive curriculum, who will cultivate learning communities,

and who will be engaged in democratic reform" ("Partnership / Guided Practice / Responsive

Curriculum / Developmental Apprenticeship - Pre-Internship-Guide.pdf," n.d.). Yet, colleges of

education are also expected to provide their pre-service teachers with the foundation to integrate

technology into their lesson plans and curriculum.

   As teacher colleges look to shift to the digital age, there is considerable pressure to

prepare their teacher candidates for life in the 21st century classroom. While the American

Association of Colleges for Teacher Education reports that 62 percent of teacher colleges have a

technology-related requirement for graduation or program completion, other organizations like

the National Council on Teacher Quality, report that only 15% of elementary and secondary

education programs require students to provide a rationale for their use of technology in a lesson

plan (Flanigan, 2015). The growth of distance education in K-12 education has had steady

growth over the past 5 years, so there is also pressure on teacher preparation programs to prepare

teacher candidates to teach online (Picciano, Seaman, & Swan, 2012). Part of that preparation

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could include recruitment and retention of teacher candidates that complete their coursework and teacher apprenticeship at a distance. The unique program studied in this research could become a model for teacher education requirements completed using distance education.

Feedback from the pre-service teaching interns about the affect of distance education on their internship experience revealed mixed considerations. All of the interns reflected that they were sure they had a different experience than their peers that participated in face-to-face classes at Midwest State University; something was missing from their interaction with the instructors and their peers. This may be related to the feeling that the Polycom video conferencing system was not compatible (Statement 4 of facilitating conditions in UTAUT) with the previous experience with video technology like Skype or Apple's FaceTime. The video conferencing system was so different that all but two of the interns would assist with the equipment set up or troubleshoot any problems. Additionally, the limited influence of "performance expectancy" on the pre-service teacher use of the technology to participate during synchronous course meetings could be a reflection of the lack of social presence. In this case, the "system" of video conferencing technology and online coursework was not very useful in their "job" as a distance learning teaching apprentice and student taking graduate-level courses. Yet other familiar and easy-to-use technology (effort expectancy and facilitating conditions) were useful to the teaching interns as part of their distance learning experience.

Despite the sense of missing out on a complete experience, the interns also described how they bonded as a cohort and relied on each other for support during the internship. The cohort became an important source of helping each other through the challenges brought upon them in a new setting; managing graduate level coursework in addition to being an apprentice teacher for eight months, and relying on technology for all communication, collaboration, and participation

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with instructors and peers. At the end of the student interviews, each intern expressed that even though there were challenges using technology for their apprenticeship year it was the experiences in the classroom with their mentor teacher and students that meant the most.

However, outside of the context of this unique program, distance education for teacher education and preparation may or may not prepare students to be effective classroom teachers. There are many questions left about how future generations will use technology and if using distance education tools will become an everyday event in their life. If that ends up being the case then the barrier described by the Digital Native pre-service teaching interns in this study may not be an issue. Or as distance technology tools like Facetime and Google Hangouts become the norm for interpersonal communication, participating and collaboration as individual avatars might just become a standard practice for conducting courses. Based on the results of this study, pre-service teaching interns still want interpersonal face-to-face interaction and feedback during one of the most important periods of time in their teacher training. Whether this is still true for future generations such as the iGeneration (born during the mid-2000s) is something for future studies to address.

APPENDICES

Appendix A – Interview Protocol

Part One

1. What year were you born?

2. What year did you graduate from high school?

3. Are you familiar with term, Digital Native? If yes, what does it mean to you? If no, what do you think it means?

4. I am going to read a description of Digital Natives. When I am done, please answer the question: Describe for me how this description fits or does not fit your perception of yourself.

5. What kind of technology did you have in your K-12 schools?

6. What kinds of technology did you have at home?

7. Describe for me the level of technology knowledge of your parents? Comfort level? (Basic, Median, Advanced) Would you describe this as "normal" for parents of friends as well? If no, why?

8. What technology did you own before entering college? How would describe your knowledge and comfort level with using this technology? (Basic, Median, Advanced)

9. What technology do you own? For example, mobile devices, computers, social media, etc..

10. Describe for me your weekly personal use of technology during your freshmen year. For example, mobile devices, computers.

11. Was it the case for you that your use of technology changed over the course of your undergraduate years education? If so, why? Was this directly related to the use of technology in your courses by faculty and instructors? Peer initiated?

12. Are you familiar with the term, Digital Literacy? If yes, what does it mean to you? If no, what do you think it means?

13. I am going to read a description of Digital Literacy. When done, please describe for me what you perceive to be your level of Digital Literacy.

14. Describe for me how your personal use of technology like smartphones, laptop, and Internet resources has affected how you use the same resources for academic work.

15. Do you expect to use technology in your academic classes? If yes, why? If no, why?

16. How do you use technology for multitasking or "task switching?"

17. Describe for me your participation in social media and online settings (blog comments, wikis, message boards)?

18. Describe for me your participation in online academic settings for your courses throughout your higher education attendance.

19. Describe for me a time when you moved from being a consumer to a creator of publicly accessible information? (Blog, Wiki, YouTube, Public Google Doc) Did you collaborate with peers? Did the use of technology in this process feel native to you?

Part Two

1. What were your expectations for the technology being used for the Chicago internship program?

2. Based on your previous experience with technology for academics, describe for me your comfort with distance learning settings. Expectations for distance learning in this setting.

3. What is your perception of the benefits of technology in the academic setting? What are the disadvantages?

4. How do you know you are learning? Learning with technology?

5. Describe for me your idealized college classroom setting? Idealized college classroom with technology integration?

6. How did you use technology to collaborate with your instructors? Peers in East Lansing? Peers in Chicago?

7. How did you collaborate to create, edit, fact-check, and complete offline and online artifacts?

8. Describe for me how you participated in the synchronous (live via video conference) course meetings with instructors? With Peers? (In Chicago and East Lansing)

9. Describe for me how your previous experience with technology helped or hindered your use of technology during the internship.

10. Describe for me the asynchronous (not live) technology that you used most often for course work. Was there one you preferred over others?

11. How did you use mobile technology for course work? What technology did you use?

12. How did you use social media for course work? What social media platforms did you use?

13. How did distance technology shape your internship experience? How will this experience shape how you use distance technology or classroom technology in the future?

14. Describe for me how pre-internship training on the distance technology would have or have not changed your experience?

15. How did the technology meet or not meet your expectations based on your previous personal and academic experience?

16. How did the distance technology alter your class participation? (Were you more quiet or more vocal)

17. How was the distance technology used as a means to purposefully NOT participate? Multitask?

18. Describe for me how distance learning worked or did not work for teacher education and preparation.

19. Given the choice between synchronous and asynchronous technology for course work, which would you prefer and why?

Appendix B – Case Study Setting

Case Study Setting

This case study is set within the context of a single distance learning urban educators internship program, which finds placements for teaching interns in a large Midwest urban school district. Students must apply to participate in the program during the fall semester of their senior year and they are notified in early spring semester. Each new cohort of interns takes a trip to the urban school district to tour the placement schools, meet with administrators, tour the city, and get started in their process to find living accommodations for the internship year. It is during this trip that interns are given a tour of the high school where they will attend their distance learning courses. They also meet the school principal and the school technical director.

The high school where rooms are rented for the distance learning classes is a small school built in 1934. Upon arriving at the school, one enters through metals doors of the school, students, staff, and visitors must pass through metal detectors and are subject to inspection if the device buzzes to indicate security must investigate the pockets or backpack of whoever just passed through. Guest must sign in with the security desk and have a specific person to visit. With wide hallways, tile floors, metal locker lined walls, and extra tall ceilings, sounds as simple as a set of keys dropping echoes through the long cavernous hallways. Staircases with the original wood handrails lead students up to the second and third floors of the schools, which mirror the maze-like floor plan of the first floor. Placed near each hallway intersection are chairs for hall monitors, dutifully directing students to quickly move between classrooms before the class period start buzzer permeates the hallways and making sure that anyone wandering the hallways during class periods has a legitimate reason to be out of class.

There are two rooms on the second floor rented by the program for facilitating the distance education classes. One serves as a teachers lounge all the others days of the school year, so it is furnished with couches, a long wooden conference room type table, a microwave, small refrigerator, copy machine, paper cutter, and a telephone. There are two entrances to the room with built-in wooden cabinets making up the space between the two doors. The cabinets appear to be original to the building. Opposite that wall are five, tall, wood frames windows, making up the majority of the wall. The other walls of the room appear to be plaster and stretch from the ceiling to the hardwood floor. The walls perpendicular to the hallway and windows have several bulletin boards, posted with staff announcements, school policies, and general paperwork. The chairs seated around the large, rectangular meeting table are padded, wooden chairs that look as old as the built-in cabinets. Upon entering the room on the day that interns occupy the room for their distance learning classes, one immediately notices the items in the room that don't fit it: a data projector on the end of the conference table, a camera that swivels 360 degrees around, a triangular microphone on the table in the middle of the table, and several cables leading from these devices to a cart with a tall, black PC-like box, and a power strip. Images from the data projector are shown on a screen pulled down in front of one of the bulletin boards. The blinds on the windows are kept closed to keep the room dark and improve the image of what is on the screen.

The second room is a large computer lab, approximately 50 feet long and 30 feet wide with a tall drop ceiling, tile floors, and creamy colored walls intermixed with wooden cabinets and molding around the windows. Dispersed throughout the room are 30 or more PC computers set along the walls and grouped into sets of 5 at various intervals. The room may have been a science laboratory in the past because along the wall opposite the windows are several white,

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upper and lower metal cabinets with inlaid glass and two working sinks. Along this same wall, in the far corner is an office built into the room with modular walls including a locking door and window. In general, the room has an extremely sterile feel to it, void of the bright bulletin boards the one would find in other classrooms or the teachers lounge. There are twelve windows of two sizes in the room: One larger window paired with the smaller window to either side with heavy industrial window blinds that can be adjusted up or down to allow in or block the light. In addition, the windows open outward to allow in fresh air. This is not the room the teaching interns have used during the past months of their course, but a temporary location due to a network error in their originally assigned classroom. That room is about a quarter of the size of the computer lab and at best, could comfortably seat twelve students and a single instructor. The basic physical characteristics are the same: tall ceilings with drop-style tiles, creamy white colors walls, wooden highlights around the room. Most sounds bounce around the room off the tile floors and cinderblock walls and noise from the hallway during class period changes sneaks under the door, blending into the room conversations.

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