DISSERTATION

MILLENNIAL COMMUNITY COLLEGE STUDENT: UNDERSTANDING THEIR

NATURAL USE OF TECHNOLOGY FOR LEARNING

Submitted by

Dennis J. Natali

School of Education

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Fall 2014

Doctoral Committee:

    Advisor: Don Quick

    Bill Timpson
    Jeffery Foley
    Greg Luft

ABSTRACT

MILLENNIAL COMMUNITY COLLEGE STUDENT: UNDERSTANDING THEIR

NATURAL USE OF TECHNOLOGY FOR LEARNING

Students of the millennial generation are generally noted as being born between 1982 and 2002. For the purpose of this study, the term - Millennial - will be considered to be the proper generational title based on the work of Howe and Strauss (2000). This study explored the natural use of technology for academic learning through the interviewed experiences of millennial students who attend community college because one area missing from the literature is the millennial community college student's voice. There are several reports of demographic statistics, but rigorous qualitative research discovering the millennials self-description of why they use technology in academia is missing and has become the driving force for this study. Using the constructivist approach of grounded theory, this study proposed a realistic theory to academia for more effective content delivery.

There were nine salient findings evinced from the interviews. The findings indicate a relationship between the requirements of classwork and their need for technology to fulfill those requirements. Findings also discovered that most millennial community college students have been using educational software since elementary school. Additionally, online education is quickly becoming an integral function of the twenty-first century collegiate landscape and the students are taking advantage of this capability because of the role-conflict that prevents full-time university attendance.

An interesting finding reveals how the students use a variety of technology and a range of methods in how they access online classwork content. But to perform these required classwork assignments, the millennial community college student must have quality access to the internet.

This study concluded with the recommendation that academia would achieve greater utility from reducing distractions and increasing bandwidth and nodes of their Wi-Fi access so that they will have a more reliable and stronger signal to accomplish their required online academic tasks.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION

Students in the millennial generation were born between 1982 through 2002 as suggested by Howe and Strauss (2000). Millennial college students have a different approach to learning than previous generations because a majority of this generation was raised with various and rapidly changing forms of computing and connection to the internet. This generation naturally uses technology to communicate, collaborate, and to learn (McCoog, 2008; Nikirk, 2009). Their expectations in the collegiate classroom were shaped by the rapid response of online media and from their primary and secondary educational experience where they were introduced to educational software and collaborative problem solving. Millennial students who attend community college share these traits, but often approach their education with a unique set of stressors which leads them to rely much more on technology than their 4-year university counterparts to stay abreast of their academic studies (Mullin, 2012; Pusser & Levin, 2009).

This study examined the voice of millennial community college students and their natural use of technology to learn. To perform this study, a *grounded theory* approach was engaged to develop theory that may be useful for the consumers of this research who endeavor to find methods that provide a higher quality educational experience for this generation (Glaser & Strauss, 1967). Students who attend a community college endure a unique set of stressors and may not be receiving the technological support they require from academia. They often add the role of *student* to other full-time roles and responsibilities such as, coordinating school, life and work, and shifting careers (Merriam, Caffarella, & Baumgartner, 2007).

This study's significance lies in the realm of exploratory research. Contemporary research focusing on the millennial community college student's voice of how and why they use

technology is almost non-existent. Studies in the area of the millennial student attending a

community college are limited to non-specific explorations by library and other centers who

study community or junior colleges (Becker, 2009; Berk, 2010; Chen, 2009; Coomes, &

DeBard, 2004; Coyne, & Cowley, 2006; Emanuel, 2013; Kuhlthau, Maniotes, & Caspari, 2007;

Lippincott, 2010). Grounded theory methods will be used to explore the "single focus"

(Creswell, 1998, p. 21) of the millennial's voice and identify important variables for a theory

generation necessary to add to the body of knowledge of the millennial community college

student genre.

The central phenomenon under study was to discover their experience of learning

educational content in terms of processes and technological tools the millennial community

college student naturally needs to learn academic content. The scope of this study remained

narrow; comparing their views, reactions, and thoughts through one-on-one interviews and the

technique of qualitative coding. To examine the central phenomenon, a qualitative research

question was developed for this investigation. It followed the process described by Creswell

(2009) using "central and associated sub-questions" (pp. 131-133).

Research Question

What theory explains why the millennial community college student needs technology for

learning?

Sub-Questions:

What tools do they naturally use to study college-level material?

What is their experience of learning outside of class?

These research and sub-questions questions, derived from four years of research, debate, and distillation, narrowed the focus of the study into "aspects of the coding steps" (Creswell, 1998, p. 103) which directed the design of this study's framework.

Conceptual Framework

The grounded theory framework for this design combined the interview, observations with field notes, and literature regarding the millennial community college student. Open and axial coding commenced after transcription of the first four interviews and then selective coding brought about a tentative core theory. Using constant comparative analysis, additional interviews were added exploring previous and new questions, until a more clarified core theory resolved from the data. Finally, a constant comparative process of exploring more literature to enhance or debate the findings was conducted until the substantive theory distilled from the procedures (Creswell, 1998, Glaser & Strauss, 1967, Straus & Corbin, 1998).

Grounded theory does not prescribe a minimum or maximum limit of interviews. The goal is to continue interviewing new participants until "theoretical saturation" (Strauss & Corbin, 1998, p. 158) occurs as exhibited when repetitions of answers are offered and nothing new is added. Each interview process was performed individually with the participants and was melded with the previous processes in a large scale constant comparative practice that examined interrelationships and continually ablated irrelevant themes until a single theory emerged.

Grounded theory is the cumulative result of hundreds of years of Social Science thought. The epistemological roots of this method quietly began with Benedict De Spinoza in 1677 when he explained that the primary character of man is to understand the "union existing between the mind and the whole of nature" (as cited in Elwes, trans. 1936, p. 6). Spinoza understood the connection that human existence was part of something larger; we are part of the process of

3

nature. He also considered and explained that an idea must correlate to the world of reality so that it faithfully reproduces an image of nature or phenomena of nature so that our mind will understand and grow to discover a new concept from the original idea.

David Hume (1748/2004), considered Spinoza's work and explained the synergistic process of idea generation with:

> A blind man can form no notion of color; a deaf man of sounds. Restore either of them that sense in which he is deficient; by opening this new inlet for his sensations, you also open an inlet for the ideas; and he finds no difficulty in conceiving these objects. (p. 10)

Hume discovered that human knowledge and understanding was not fixed or maximized. There were always new vistas of understanding that could be achieved by studying the inlets or the published work of others through the lens of critical thinking. As this process evolved, Dewey (1929) also considered mankind's quest for understanding by discovering that the search for knowledge will necessarily involve action and change.

The advancement towards understanding the human condition was a process of knowledge generation growing from connection to nature, how ideas are formed, and the critical synergy of prior knowledge with its character for creating action and change. Grounded theory was born of this evolutionary process through the work on Glaser and Strauss in 1967. They presented this new process of understanding and explaining the human condition through the steps of inquiry, comparative analysis, synthesis, and theory generation.

The unique feature of grounded theory is that it creates an explanation of human social phenomena as an actionable strategy. The result of a grounded theory study produces Dewey's (1929) action and change through generating or discovering a theory, a new theory, which explains human social phenomena that can be operationalized to produce an explanation of the

human condition for further development into deeper understanding (O'Neill, 1961; Glaser & Strauss, 1967; Daniels, 2012).

In academia, when researchers learn the new landscape where students exist, they can modify curriculum and interactions to reach the students in recognizable terminology. This research will explore the millennial community college student's perspective of why they use technology to perform academic work because there is very little knowledge available in the literature on this narrow topic.

Investigator's Perspective

I have been involved with sideline observations of the millennial generation since the birth of my son in 1991. I watched my son's age cohort grow up through school, Boy Scouts, sports teams, and numerous activities where I was the taxi for this group. I began to notice in 2005 how my son and three friends were texting each other while simultaneously jumping on a trampoline, I also noticed how this cohort was able to text each other with their hands in their hoodies because they memorized the phone's keyboard map. After seeing that the phone bill had over 5,000 text messages sent per month, I noticed how this cohort remained socially connected day and night.

Finally, in 2009, after watching four of them do homework with Internet Relay Chat (IRC) chat rooms, MySpace, music, texting on cell phones, and a game or two on the computer, yet perform well in school, I became intrigued with this technological talent of the millennials and decided to study this topic at the Ph.D. level at Colorado State University.

CHAPTER 2: REVIEW OF THE LITERATURE

Grounded theory – in its pure form – abhors preparatory literature review because it may sidetrack and bias the researcher in the direction of a pre-determined conclusion instead of allowing the data itself to lead towards new theories (Bryant, 2002; Glaser & Strauss, 1967; McCallin, 2003). In the decades following Glaser and Strauss' seminal *The Discovery of Grounded Theory: Strategies for Qualitative Research* (1967), several theorists have thoughtfully added to the grounded theory conversation and consider some review of the literature necessary. Coffey and Aktinson (1996) began this discussion with: "The open-mindedness of the researcher should not be mistaken for the empty mindedness of the researcher" (p. 157) which supported Cutcliffe (2000) as he offered: "no potential researcher is an empty vessel" (p. 1480). McGhee, Marland, and Atkinson (2007) along with Coyne and Cowley (2006), along with Dunne (2011) added to this argument that it may be necessary for the grounded theorist to perform a preliminary literature review to assist in the research approach and formulate a cogent rationale for this study.

Finally, other theorists attempted to seal the argument by suggesting that a researcher cannot truly be considered "tabla rasa" (Layder, 1998, p. 55) or a "theoretical virgin" (Clarke, 2005, p. 13); the researcher must know something about the subject under study. Therefore, an abridged literature review was performed to explore the underpinnings of the topics this study examined and assisted in the development of a research methodology. While the previously mentioned authors argued for a preparatory literature review, all agreed with Glaser and Strauss (1967) that additional literature studies are to be blended into the discussion section of research after the core theory emerges.

To answer the research question of *What theory explains why the millennial community college student needs technology for learning?*, various literature topics were explored such as, (a) a cursory view of the millennial college student, (b) the millennials use of technology for learning with sub-categories of natural usage and non-classroom learning, and (c) the millennial community college student's unique needs.

The Millennial College Student

The millennial is the latest generation to attend college. Howe and Strauss (2000) defined the term – generation – as a "society-wide peer group, who collectively possess a common persona" (p. 40). The authors clarified the time-span of this peer group to be approximately 20-21 years and isolate the birth years for the millennial generation to be within "1982 – 2002" (p. 41). This generation carried several monikers, such as: Generation Y, Generation M, and Echo Boomers, Digital Natives, Generation Me, Trophy Kids, Generation 2000, and Boomer Babies (Alsop, 2008; Ennis & Gambrel, 2010; Davis, 2003; Howe & Strauss, 2000; Twenge, 2006). However, Howe and Strauss (2000) were the first to coin the generational label - Millennial - after their "Class of 2000 Survey" (p. 10) where they offered the graduating classes of high school students a variety of names. The name that stood out for an undisclosed majority of students was "Millennial" (p. 29). For the purpose of this study, the term - Millennial - will be considered to be the proper generational title.

Qualitative studies in the literature primarily described the social and collegiate interaction of the millennial college student. These studies agreed that the millennials learn and interact differently than their older classmates, and narrow the usage of technology to personal and academic communications (Kvavik, 2013). Since they grew up with the internet and rapidly

7

changing versions of communication technology, millennials have the ability to adapt and respond to multitasking in both performance and receiving information.

McGlynn's (2005) research supported this view and added: "these students appreciate teamwork, experiential activities, structure, and the use of technology" (p. 13). Investigating the multitasking phenomenon, McCoog (2008) interviewed parents of millennials and quoted a participant's description of her daughter:

> She would be in her bedroom, iPod charging on the desk, headphones in ears, cell phone in one hand, paperback in the other, television tuned to a Gilmore Girls rerun, and computer with display divided among iTunes, YouTube, a Pride and Prejudice DVD, and of course, MySpace (p. 2).

The millennials' strengths include: goal orientation, positive attitudes, a collaborative learning style, and multitasking (McGlynn, 2005). Multitasking is a way of life for this generation and the cause of debate.

Several researchers, Bass (2013), Bonner II (2010), Haugen and Musser (2013), and Twenge (2006), discussed multitasking as a possible cause for under-achieving and weakness in this generation. Their over-arching theme for the millennials weakness is laziness or distraction due to technology. Several researchers (Bauerlein, 2013; Bonner II, 2010; Goodstein, 2007; Greenberg & Weber, 2008) disagreed and cannot see any significance when compared to previous generations because every generation seems to have the same level of distraction. While the topic of *distraction* is beyond the scope of this study's research question, there is enough of a debate to require a discussion. Therefore if any evidence is discovered, this study will add new facts for consideration. Although there may be evidence of academic weakness due to the millennial's technology, current research in the field offered an opposing view.

In the late 1700's and early 1800's, teenage women began to read popular press and this was considered a disease that distracted them from family duties. The early 1900's found

teenagers attending movies instead of attending to family chores; the 1920's found teenagers dancing. The list continues through drive-in movies, sock-hops, drugs and concerts of the hippie culture in the 1960's, and continues through today with social media (Bauerlein, 2013; Bonner II, 2010; Goodstein, 2007; Greenberg & Weber, 2008). It appears that for the early twenty-first century teenager, technology is simply a form of distraction, not the cause of it. If internet-based technology were not present, today's teenagers would be distracted by another form of social entertainment and today's social critics would lament of the young adult's work-ethic as they have through every generation.

Some traits of millennials as reported by Sweeney (2007) included: they rarely read newspapers or books. They are impatient, goal oriented, and think it is "cool to be smart" (p. 1). They hate busywork, prefer experiential learning over rote memorization, are used to instant feedback, and expect a chance to re-accomplish their academic work to receive an A-grade (McCoog, 2008; Nikirk, 2009; Squire & Steinkuehler, 2005). They want flexibility and control in the classroom and in their lives. Howe and Strauss (2000) furthered this list of traits with: "More affluent, better educated, more ethnically diverse, happy, positive, confident, cooperative team players, accept authority, rule followers, most watched over generation, and optimistic of the future" (pp. 4 -15). These authors described a generation of students that are actively and collaboratively involved with their learning environment and community.

Narrowing the literature focus to the millennial in college, their generational culture is the greatest influence towards academic performance and "shapes notions of learning and knowing" (Merriam & Brockett, 2007, p. 305). They expect to use any and all technology available for subject matter discussions and research however, they do not lean towards all-online classes; they prefer the flexibility of the mix of classroom and on-line (Kvavik, 2013, Sweeney, 2007).

They were experientially trained from their early years that twenty-first century life

requires them to communicate effectively on various and changing technology platforms

(Glastra, Hake, & Schedler, 2004; Wagner, 2008). Their life-long exposure to daily world

events and online experience with multiple cultures provides a challenge to the twenty-first

century college; this generation wants to be educated to live and work in a multi-cultural,

"information-rich technological environment" where they are immersed in "highly engaging

inquiry projects" (Kuhlthau et al., (2007), pp. 2, 148).

One area missing from the literature is the millennial community college student's voice.

There are several reports of demographic statistics, but rigorous qualitative research discovering

their self-description of why they use technology in academia is missing and has become the

driving force for this study.

Use of Technology for Learning

"If we teach today's students as we taught yesterday's, we rob them of tomorrow"

(Dewey, 1944, p. 167). Dewey observed that every new generation required changes to the

approach that educators employed. A major cultural influence for the millennial generation has

been the development of the world-wide web in 1991 (Howe, 2012; King, 2010). Since then,

numerous hardware and software tools to access data on practically every topic were developed

along with multiple methods to communicate including peer-to-peer text, video, encyclopedic

references, and online learning. Merriam and Brockett (2007), called it "an explosion in the

availability of information" (p. 311) and Nikirk (2009) supported this by describing how the

rapid availability of technology is integrated in the millennials lives though cell phones, iPods,

MySpace, Facebook and other social media outlets. With the development of the "Smart Phone"

(Martin, 2009, para. 3) and its evolved ability to connect to the world-wide web, the millennials – in particular – are continuously connected to a global network of peers and information.

Considering that as of now, half of the millennials are adults; adult learning in the twenty-first century is more intricate due to the complexities of twenty-first century problems. The interconnectedness of nations, businesses, economies, and people, "demands answers to new problems" (Wagner, 2008, p. 257); requiring new informed solutions. Merriam et al. (2007), reflected on the adult learner in the twenty-first century and found that learning requires "individuals interacting with the context" (p. 427), so continuous connectivity to the world-wide web is evolving into a necessary tool for higher education because the circumstances of the topics under study are always in flux (Bateson, 1994).

While discussing the role of the technology and learning, Wagner (2008) offered: "work, learning, and citizenship in the twenty-first century demand that we all know how to think - to reason, analyze, weigh evidence, problem-solve, and to communicate effectively" (p. xxiii). Wagner (2008) continued in the discussion of how technology is the de facto tool of the twenty-first century adult for learning, citizenship, and day-to-day life. Technology is an enabler, a tool, of education for this generation, not the focus. Bajt (2011) supported this with, "the students of this generation focus on what they want to learn, not on the technology that enables them to learn" (p. 56). With such a need of technology in the millennial's academic and social life, the literature narrows and details how naturally millennials adopt technology.

Natural Use of Technology

Defining a generation's culture may not apply for every member of the societal peer group, especially the sample of people born in the fringes of the generational boundaries.

Therefore, expressing the natural use of technology is a generalization for the majority of millennials (Howe & Strauss, 2000).

The use of technology in higher education is growing almost daily. A study conducted on millennial college students by the Center for Applied Research (Dahlstrom, 2012), found over ninety-percent owned a computer and other forms of technology for personal and academic communications and discovered that twelve-million students take at least one class online. By 2017 that number is expected to exceed twenty-two million. Other facts from this research of technology usage found about seventy-percent of millennial college students use keyboards to take notes, ninety-one percent use email to communicate with their professors, seventy-three percent believe they cannot study without technology, and thirty-eight percent feel the need to check their smartphone every ten minutes (Kvavik, 2013; Laird, 2012). An excerpt from a University of Washington study on millennial college students quoted a participant with: "I am no longer bound by what the professor gives me in a class, and his perspective on something. There are lots of engineering forums that I can just Google" (O'Donnell, 2011, para. 8). Technology is a natural part of the millennials life. It is as common as the "Boomer" (Howe & Strauss, 2000, p. 41) generation's sudden increase in ownership of the automobile, microwave oven, and video cassette recorder (VCR).

Sheldon's (2012) research of millennial college students in a multiplayer classroom, found that "even the youngest child expects a certain level of engagement" (p. 206); an expectation which evolved from video games. When professors use technology to present college-level material, the millennial student will "notice the difference in quality immediately and punish us with their inattention" (p. 206). The millennial college student uses technology as a natural method for interpersonal communication and academic study. It is a part of their

ordinary culture both in and outside of the classroom. They consider a simple lecture with PowerPoint as "monotasking" (Davis, 2003, p. 19) and are "accustomed to the multitasking, connected, and immediate payoff world of their video games and online experiences" (Bajt, 2011, p. 54). In addition to classroom activities, the millennial student also uses technology outside of class to make sense of the material as discussed next.

Non-Classroom Learning

Millennial college students – in general - prefer to study collaboratively as a social network. I first noticed this during a pilot study performed for an earlier class (Natali, 2009). This excerpt (p. 16) is from the data collection interview with six millennial community college students (pseudonyms added for confidentiality) on the topic of using technology for studying:

Shelia: I usually write my own notes and then trade notes with other people and combine all the notes that I have which…

Harold: Or, have everybody email each other the notes and one person compiles the notes into one and sends it out to everybody else …

Susan: It's basically the same thing…

Harold: It helps so much. I was having a lot of problems in a class last semester and I ended up getting an A in it because I did that with other people.

Interviewer: So do you feel that collaborative learning is more of a tool that you are used to?

[Said simultaneously] Harold: Oh Yeah! Susan: Yes.

Susan: We can take notes directly from that and ask other students about their notes, compile the notes, and just keep going from there.

Fundamental awareness in academia states that a college student is expected to study or prepare approximately 3 hours weekly, for each classroom hour. As this previous excerpt indicates, the millennials do this through collaborative online techniques. For millennials, learning is a social event.

The concept of social learning with the millennial college student – in general - has also been noted in the literature. McGlynn (2005) observed that millennial college students "gravitate towards group activity" (p. 13) and "millennials want to learn by working collaboratively; many of them enjoy the activity of teamwork" (p. 15). Wilson (2004) agreed and added, "working with others can increase involvement in learning" (p. 60) along with "they have likely experienced more cooperative and collaborative learning environments prior to college. This could bode well for their willingness and ability to work with peers in college classrooms to enhance learning" (p. 61). The millennial college student has learned through primary and secondary education to create a social network of peers for learning class material such as gathering facts for an exam and to gain a better understanding for passing the course. In class, many students use their tablet, laptop or cell phone to transcribe notes and then outside of class, on their free time, they pool their resources in a social space such as Google Docs for sharing (Fenwick, 2003).

The millennials collaborative efforts create a shared "community of experience whose meaning is constructed together amid conversation and joint action" (Fenwick, 2003, p. 13). This can be expected as the millennial – student or otherwise – share most of their day-to-day activities outside of the classroom though social websites such as MySpace, Twitter, or Facebook. Each student adds value to the social learning process through the lens of "their unique sociocultural context" (Merriam et al., (2007), p. 434); combined, these students take

exams and engage in classroom discussions under the aspect of self-constructed knowledge garnered outside of class (Driscoll, 1994; Fenwick, 2003; Jackson, 1996; Kvavik, 2013). Exploring how students learn outside the classroom is where the literature begins to falter and isolates the lack of knowledge on the millennial community college student.

Millennial Community College Student

There is a unique aspect to millennial students who attend community college; they are virtually the same as a traditional four-year college student in terms of technology usage, but they primarily attend community college because of socio-economic forces and role-conflict (Glastra et al., 2004; Pusser & Levin, 2009).

Over half of the seven million community college students work full time and "can be considered workers who attend college, not students who work" (Pusser & Levin, 2009, p. 14). More than forty percent live in poverty with thirty-one percent receiving Pell Grants.   Many community college students are one paycheck away from economic distress and find their studies as a hope for a better future (Mullin, 2012; Pusser & Levin, 2009).

Millennials comprise over half (68% - 73%) of the community college population and in addition to socio-economic concerns, role-conflict often prevents them from attending full-time at a four-year college or university. They often "add the role of learner to other full-time roles and responsibilities" (Merriam et al. 2007, p. 428) and must coordinate school, life and work, and shifting careers, because they seldom have just one issue which requires their full attention (Bateson, 1994; Chen, 2009; Glastra et al., 2004 ; Merriam et al., 2007).

The millennial community college student lives with a unique set of stressors and relies on technology to remain caught-up with class material. Through the collaborative efforts of a close-knit peer group, they learn to overcome the time constraints of their multiple

responsibilities with the technology they have available to them and achieve success one exam at a time.

Conclusion

Millennial community college students learn and interact differently than previous generations of college students. They are multitask learners who collaboratively share the data they garner from their classes. Through the synergistic effect of online debate and explanation, they arrive at collective knowledge.

The millennial student who attends a community college experiences a unique set of stressors such as socio-economic and role-conflict forces that inhibit their ability to attend a four-year university full time. Many have full-time roles and attend college part-time via Pell grants. They rely on technology to assist them with their limited time to study effectively. This study explored why they employ technology because there is very little knowledge available in the literature on this narrow topic.

CHAPTER 3: METHODOLOGY

Literature on the millennial community college student in the previous chapter indicated a gap in our knowledge concerning their voice as to why they use technology for learning in higher education. This study has been designed to partially fill that gap of knowledge and add to the body of literature. In the pursuit to discover and understand knowledge, academicians have continuously generated theories regarding the learning, knowing, and social interaction processes of the human mind. Grounded theory has developed from this evolution as a method of investigation to explain the phenomena of social interaction (Glaser & Strauss, 1967; O'Neill, 1961). I applied grounded theory methodology to answer the research question of: What theory explains why the millennial community college student needs technology for learning?

The unique feature of grounded theory is that it creates an explanation of human social phenomena as an actionable strategy. The result of a grounded theory study produces "action and change" (O'Neill, 1961, p. 201) through generating or discovering a theory, a new theory, which explains human social phenomena and can be operationalized to produce an explanation of the human condition for further development into deeper understanding. Strauss and Corbin (1998) define *phenomenon* as "problems and issues" along with the tools of "action and interaction" (p. 267) one uses to manage those problems and issues (Daniels, 2012; Glaser & Strauss, 1967; O'Neill, 1961).

Synthesizing these points, the central phenomenon under study was to discover exactly why the millennial community college student naturally needs technologically enhanced processes and tools to learn academic material. The scope of this study remained narrow; the constant comparison of their views, reactions, and thoughts through one-on-one interviews and the technique of qualitative coding (Glesne, 2006). This narrow focus allowed for data

saturation to emerge and offered the tenants of a theory which explained where the students exist regarding technologically enhanced academic study methods (Scott, 2009).

In academia, when we learn the new landscape where our students exist, we can modify curriculum and interactions to reach the students in terms that their generation will understand. The results of this research are expected to provide a theory of what could work well in academic content delivery.

Research Methodology

The design of this qualitative approach existed under the constructivist worldview; narrowed to grounded theory design, and used recorded interview data collection with open-ended questions (Creswell, 1998).

Grounded Theory

Grounded theory, along with other traditions of inquiry such as Phenomenology and Biography (Narrative) methods, rely primarily on interviews to study how individuals create meaning from their sociological situations. Grounded theory stresses open processes such as open-ended questions and constant comparative analysis which are necessary when exploring the meaning of a phenomenon rather than the fixed, a priori processes often found in quantitative research. Further, grounded theory is an inductive process – theory emerges and continually grows out of the data collected (Bryant, 2002; Creswell, 1998; Moustakas, 1994).

Merriam (2002) clarified the grounded theory process by describing that the goal is to create "substantive theory" (p. 7) that explains real-world situations. She went on to explain how the constant comparative method is used throughout the analysis process and that the substantive theory states the "relationships among categories and properties" (p. 8) evinced from the open, axial, and selective coding procedures. Grounded theory is an inductive process of investigation

where the researcher is the primary instrument to gather data from social actor's "account of reality in a social context" (Bryant, 2002, p. 2). These data can come from incidents, observations of behavior, or in most cases, interviews.

After transcription, (1) open coding is first applied to the data where the researcher analyzes each line of text and overall themes to find a category of placement. Next, (2) axial coding is used to connect the various categories and properties. Finally, (3) selective coding is used to cull the categories into a grand theme or emerging core theory. At this point, the researcher asks if this solves the riddle of why the event took place. If not, the process is repeated with new interviews again and again until saturation occurs. *Saturation* is the event where nothing new is added to the emerging core theory (Glaser & Strauss, 1967).

A unique feature of grounded theory is constant comparative analysis. This technique is used during and after the emerging core theory is discovered. It is an overarching approach to fill gaps in analysis with further interviews or observations and blend the loose ends of the research in the effort to solidify themes and categories into a final core theory. At this point, the final core theory is compared against current research and worded into the substantive theory that explains a reason for a particular social interaction or a human reaction. If more than one category stands out, then a decision will be made to determine which category will answer the research question and focus on that (Straus & Corbin, 1998). The ability for a theory to grow from the collected and analyzed data limits researcher bias to a degree (Boeije, 2002; Borgatti, 2011; Brott & Myers, 2002; Bryant, 2002; Charmaz, 2000; Creswell, 2009; Glaser, 2002; Glaser & Strauss, 1967; Merriam, 2002).

The reason for the open-ended questions in this study was to allow the theory to be generated and driven by data collection and analysis of the study participant's candid

descriptions of the phenomena (Creswell, 1998). The narrow phenomenon under study was why millennial community college students naturally use technology to learn.

To summarize the methodology employed in this research:

- World-view/system: Constructivist/Grounded Theory

- Target population: Millennial community college students attending classes at Pikes Peak Community College in Colorado Springs, Colorado

- Data collection: Open-ended questions in one-on-one interviews and observations

- Data analysis and theory generation: Grounded theory techniques

The research methodology of grounded theory requires adherence to a tedious procedure while at the same time, allows creativity to foster during the constant comparison of emerging data (Creswell, 1998). To prevent bias from developing during the comparisons of data, grounded theory adopts the quantitative terms of validity and reliability as the method of trustworthiness.

Trustworthiness

With qualitative, constructivist, grounded theory research, accuracy can be achieved through careful attention to validity and reliability throughout the research process. During the design of research strategy, a researcher must demonstrate methods of accuracy to offer a result worthy of consideration by future researchers (Lewis, 2009; Maxwell, 1996).

Considering accuracy in the research process, Creswell (2009), discusses the process of ensuring research is as close to the truth as possible by acknowledging the researcher's bias, the use of thick-rich descriptions, and the use of member-checking. While "knowledge is conjectural – absolute truth can never be found" (p. 7), it is imperative that the researcher strive towards this goal through addressing validity and reliability in the distinct phases of the research.

20

To confirm "trustworthiness" (Eliot, 2011, para. 5) in this study, I have carefully considered researcher's bias, thick-rich descriptions, and member-checking.

Researcher's bias. Maykut and Morehouse (1994) discussed researchers' perspective in great detail. They advise any qualitative researcher to observe the phenomenon with empathy towards the social actors under study but also be keenly aware of one's own bias and social filters. They call this state of mind "in-dwell" (p. 123). To expand empathy and soften the bias in this study, I focused on the trustworthiness of this research practice.

I acknowledge that my bias leaned towards the advocacy perspective. My wish is that the results of this study help create a positive change of academic content delivery for community college students. To prevent other personal biases from entering this study, I performed a rigorous treatment of validity and reliability with this study's design, data collection, and data analysis. Epoché, I acknowledge that my personal educational bias was shaped during my undergraduate experience before computers were commonly used. I spent many hours at the college library in small class-teams, searching though card catalog and topical indexes to create a flip-chart presentation; this process does not apply to the twenty-first century college student. So I approached this study with an open mind; seeking how the millennial community college student prefers to learn academic material outside of the classroom.

Thick-rich descriptions. For this research, validity was defined as having the qualities of significance, generalizability, consistency, reproducibility, precision, and verifiability (Strauss & Corbin, 1998). Authors of grounded theory also note that for reproducibility, it is rare to find the exact situation in a similar social science study, so the thick-rich descriptions of location and interview comments were used in this study to provide future grounded theory researchers' the

21

adjustments necessary for comparing their substantive theory to the one found in this study (Creswell, 2009; Glaser & Strauss, 1967; Strauss & Corbin, 1998).

Member-checking. Reliability was defined as dependability in research findings through identification of researcher biases and consistency in interviewing, coding, and member-checking with participants (Glesne, 2006; Lewis, 2009). Enhancing reliability was accomplished through the creation of an audit trail and qualitative codebook in the data analysis phase (Creswell, 2009; Lewis, 2009).

Site and Participants

Research Location. The site selected for study is, in the research term, - my backyard - which is a rather large community college in Colorado Springs, Colorado. Specifically, the college I teach at and performed the study was Pikes Peak Community College, Rampart Campus. With respect to this institution, I submitted and received a letter of permission from the college president to identify the college and campus in this study (L. Bolton, personal communication, March 19, 2013).

To discover a representative group of students, I selected the student commons area of the school to begin observations because on any given day, dozens to hundreds of students sit in the area to study, eat, or socialize. When I selected the research topic of the millennial community college students use of technology, the commons area was a natural focal point because it is a local Wi-Fi hotspot and many students gather here.

The commons area is a large, 2-story, rectangular area with several seating areas for students and college employees. The dimensions are about 100 feet wide and 200 feet long with walls of glass on the North and South and joins together the four wings of the campus. It has a

ground floor with two large seating areas and a second floor with smaller, quiet study areas (Christiansen, H. & Partners, 1996).

As Figure 1 displays, two of the seating areas are on the ground floor with the largest located under the American Flag and a smaller, more intimate setting with comfortable chairs and couches in the foreground. The smaller seating area is normally found with students in isolation or in small study groups.

On the second floor there is one small quiet area behind the picture with 20 comfortable chairs. I have noticed that this area contains the most isolated students who are intensely studying, napping or using their laptop or tablet. The second floor also contains many single tables scattered around the walkway overlooking the ground floor; again, primarily used by

Figure 1. Personal Photo of Commons Area

students who wish to study alone. Since this is a commuter college without dormitories, very few will stay in this break area after class, so I ascertain that they are in the break area before or between classes (Axtell-Paulsen, 1998, Christiansen, H. & Partners, 1996; Pikes Peak Community Newsletter, 1998).

Satisfying Glesne's (2006) suggestion for describing what is "particular about the research site" (p. 169), I explored the archives for this building to find out if the commons area was designed this way or an evolutionary accident. I contacted the archivist for the college and was allowed to view the original documents used in the development of the commons area.

In the initial proposal, the design team's goal was to create an "area of community" (Christiansen, H. & Partners, 1996, p. 7) instead of a large building. The first idea was to have a "Quad" (p. 7) which the documents described as a traditional unifying element that would be used by a larger percentage of students than any other area. The documents eventually agreed on an enclosed, spacious, windowed, commons area. The original documents from the mid-1990's have no mention of Wi-Fi or any type of personal technological access, hence, finding AC power is a bit of a challenge and many students carry power strips with them for multiple access to electricity.

The research participants chosen for this study were currently enrolled students at this college. Approximately 60% of the students each semester are in the millennial generation. I believe this target group was data-rich for the research question because this was the first generation to grow up with the internet as a means of communication and fact gathering and are also comfortable with the rapid changes in communication devices and methods.

Participant descriptions. The first participant chose the pseudonym of "Larsen" and was a female college freshman approximately 1-2 years out of high school. She was a Biological Science major attending this community college to complete core coursework to transfer into a 4-year university. I noticed her in the student commons area studying, doing homework, or relaxing using laptops, cell phones, and ear phones rather than ear buds. This interview took place over two days that were about one month apart. The second interview was a follow-up of the first one because my questions were not open enough to gather a rich explanation of the experience.

The second participant chose the pseudonym of "Bree" and was a female college sophomore, approximately 2-3 years out of high school. She was a Business major attending this

community college to complete core coursework that will transfer to a 4-year university. I noticed her in the student commons area studying with friends, doing homework, or relaxing using tablets, and cell phones.

The third participant chose the pseudonym of "Alfonso" and was a male college sophomore in his last semester, approximately 6-8 years out of high school. He was a Non-Declared major attending this community college to complete core coursework to transfer into a 4-year university. He was a student in one of my classes several semesters ago.

The forth participant chose the pseudonym of "Rose" and was a female college sophomore, approximately 5-8 years out of high school. She was an Accounting major attending this community college to complete core coursework to transfer into a 4-year university.

The fifth participant chose the pseudonym of "Bob" and was a male college freshman in his second semester, approximately 12 - 14 years out of high school. Bob discovered I was conducting this research through a friend and sent me an email asking to participate. He self-identified his age, which would place him around the oldest edge of the millennial generation. He is a Computer Science major in his sophomore year.

The sixth and seventh participants are both college freshmen and happen to be friends as well as business partners. They are starting up an LLC which will focus in the Import and Export business. I knew the 7th participant from a prior class several semesters ago and met them in the commons area. We discussed my dissertation topic, and both agreed to be very interested in performing the interviews. I arranged separate interviews with each.

The sixth participant chose the pseudonym of "Corey" and was a male college freshman and approximately 1-2 years out of high school. He was a Marketing major attending this community college to complete core coursework to transfer into a 4-year university.

The seventh participant chose the pseudonym of "Jeff" and was a male college freshman and approximately 1-2 years out of high school. He was a Business Entrepreneur major attending this community college to complete core coursework to transfer into a 4-year university.

Protection of study participants. The highest concern in academic research is to not cause any harm to research participants. Gliner, Morgan, and Leech (2009) provided a checklist from the "Belmont Report" (p. 193) to consider for participant safety. I have reviewed each checklist item to ensure these tenants were considered in this research.

Respect for persons. This study considered the participants as autonomous agents and capable of making their own decisions. To ensure respect was thought through carefully, voluntary informed consent and privacy were considered in detail.

Voluntary informed consent. Each participant was given a consent form prior to the interview. The form provided the information they needed to understand the purpose, risks, and benefits of the interview. To ensure comprehension, the participant must be over 18 years old, or have a parent signature if under-age, and must volunteer to be a part of this study.

Privacy. To ensure privacy, the participant was not identified anywhere in the interview, coding, verbal discussions, or reporting of results. The participant's name is on their unique consent form, but this is for administrative and member-checking purposes and will be held confidentially by the principal investigator and co-investigator.

Beneficence. While the goal of beneficence is to maximize the potential benefits and minimize risk, this study may if fact be beneficial to the participants. Through the interview and member-checking process, the participants learned of the details of a Ph.D. research process. In my pilot interviews for prior classwork (Natali, 2009), every participant became interested in

26

future academic work. This occurred again in this series of interviews where two of the

participants became interested in future academic work because they found the coding process

and development of meaning from an interview intriguing.

Justice. This study did not in any way become exploitive; there was no grading or effect

on their grade since I avoided students who are in my current or future semester classes. Prior to

the start of the interview, the participant understood that they may choose not to participate, not

answer any question, or leave the interview at any time.

Data Collection and Analysis

Data collection. To recruit research participants, I performed field work during October,

2013 through March, 2014 in the commons area to observe students and how they use

technology to study. I introduced myself as both a faculty member of the college and a Colorado

State University Ph.D. candidate, explained the study to them, and asked them if they were

interested in being a participant. I specifically filtered and qualified the participants by only

interviewing those born between the years of 1982 and 2002 – the "Millennial Generation"

(Howe & Strauss, 2000, p. 41) year span if they self-reported. When they agreed, I reserved a

library study room for the interview. Four students were not interested, so the contact was over.

Instead of asking the participants directly how old they were I simply mentioned that my study

was focused on the millennial generation and provided the birth years. Six of the seven

participants self-identified that they were born in that time frame. One participant sent me an

email asking to participate and provided his birthday which placed him into the leading edge of

the older millennials.

All of the interviews were conducted in the campus library which is visible in Figure 1

above the American Flag and below the wall clock. There are small conference rooms that I

27

reserved for the interviews. This neutral location was selected instead of my faculty office or the commons area to prevent participant reactivity or distractions as recommended by Lewis (2009) and Maxwell (1996).

To collect data for the analysis, I performed one-on-one interviews using a digital voice recorder. The intent of the interview questions below were meant to garner the data that inductively generated a theory or pattern of meaning in the participants' context of obtaining academic delivery content. Following Creswell (2009), the questions were designed to avoid reference to literature or theory; this is to prevent bias or leading questions.

Interview questions. These questions were used to help guide the interview process; a few of the participants answered several of them out of order without being asked since the topics were of the same genre:

- How do you use technology specifically for your coursework?
- How have you used technology to collaborate with classmates on class assignments?
- How does technology support your learning?
- How does technology interfere with your learning?

Interview process. I met with each participant on the scheduled time and began by reviewing the informed consent form. I explained that they had the freedom to not sign the form and leave the study. Each interview consisted of the participant and myself with a digital voice recorder, consent form, question sheet and notepad. Each interview lasted approximately 30 minutes. Since these were open-ended questions, they did most of the talking and I asked clarification questions to stay on topic. Immediately after the interview, I transcribed the data and uploaded the verbiage into *Atlas ti* (v. 7). I made follow-up appointments with each

participant for member-checking as indicated in the consent form. We met again in the library study room for these follow-up appointments.

After the interview process with the first participant was concluded, more participant interviews were conducted following the same process described earlier. Each interview was conducted independently; the contact, interview, transcription, and follow-up. This back-and-forth process of interview versus coding is, as Strauss and Corbin (1998) note: "an interplay between the researchers and the data" (p. 13).   These interviews continued until I detected recurrence of concepts which arose during the transcription of the forth interview. At this point, the grounded theory coding process was employed develop an emerging core theory.

Open coding analysis. The first step after each participant interview was to transcribe the recorded interview onto a document. Then, using member-checking to maintain accuracy in the research, a follow-up interview was arranged with the participant to clean up "ahhhs," "umms," and disjointed or incomplete sentences.

After interviewing the fourth participant, I felt as if I had collected enough data to begin the first analysis because I started hearing similar patterns emerge during the third and fourth participant interviews. After reading through all four transcripts several times, I began to notice patterns in the text and commenced coding. All transcripts were collected into Atlas ti and the open coding technique was employed to "fracture" (Strauss & Corbin, 1998, p. 124) the interviews and then sort them into conceptual groups or categories. From here, the categories are further fractured into "properties" which Glaser and Strauss define as a "conceptual aspect or element of a category" (1967, p. 36).

Glaser and Strauss (1967) suggested using the open coded data by itself (in vivo) to develop categorical regions. While this could be true for long-term observation or an open

discussion about a particular topic, this interview was crafted into four distinct question areas; these will become the coding categories of Coursework, Collaboration, Support, and Distraction. The delineation of these categories is supported by the author's comment of "a category stands by itself as a conceptual element of the theory" (1967, p. 36) and each of the four question areas is an element of the research question. After analysis of each of these conceptual areas, axial coding will "reassemble" (Strauss & Corbin, 1998, p. 124) these categories and properties into contextual factors that eventually lead to a core emerging theory. Roberts (2004), recommended a "funnel" (p. 120) approach to clarify meaning, therefore, this analysis will employ the process of open coding, collecting codes of shared meaning, telling the story, summarizing, distilling key points, and then using axial and selective coding to find contextual factors which will lead to the emergence of an initial core theory of how the participants derive meaning from their experience.

An open coding process from the nearly three hours of combined recorded transcription, evinced 185 quotes and developed twelve standard qualitative codes such as *CW-Tool* for Coursework - *Technological Tools*. Of the 185, there were 41 quotes that deserved their own category of "Surprising" or "Unusual" as suggested by Creswell (2009, p. 187). I gave this code the name of *INT* for *Interesting*. The remaining 144 quotes were sorted in throughout the four categories and developed into twelve properties. All of these codes were collected in a "qualitative codebook" that Creswell describes as "invaluable" towards proper administration of the analysis (2009, pp. 187-188).

Theory generation. To build a theory, Creswell (1998), Glaser and Strauss (1967), and Wolcott (1994) suggested the following method:

1. Define conceptual categories.

2. Generalize relationship among categories.

3. Writing the theory - Transform data into information. Create a story line of the

phenomenon.

As illustrated in Figure 2, during the first two steps, open and axial coding will be used to

segment the interviews into categories to find central phenomenon and context. Next, selective

coding is used to create a story line to generalize the relationships which will yield the

phenomenon. Meanwhile, during the three coding processes, constant comparative analysis was

used for the discovery of underlying uniformities which led to theory development. At this

point, it is expected that: (1) Theory begins to solidify – major modifications become less and

less, (2) Reduction of categories begins, and (3) The core theory emerges (Bryant, 2002;

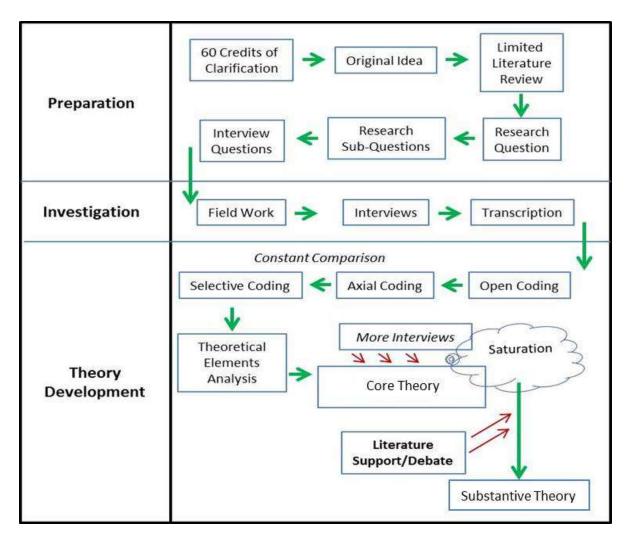Creswell, 1998; Glaser & Strauss, 1967).

Figure 2. Conceptual Framework of this Grounded Theory study.

Conclusion

This study was conducted on the student population at Pikes Peak Community College in Colorado Springs, Colorado. The research focused on why the millennial community college student needs technology to learn academic material because there was very little data available in the literature. Data collection was performed with one-on-one interviews to capture the participants' views and natural experiences that stand out for them.

The search for apodictic truth has been an elusive goal since the early Greeks and 16th and 17th century philosophers. Both historical philosophers and modern researchers have come

to realize that absolute truth can never be found, hence, the results of data analysis in this

research may allow for the "creative reconstruction of the present state of conditions" (Dewey,

1968, p. 31), but will assume some level of imperfection (Creswell, 2009; Glaser & Strauss,

1967).

CHAPTER 4: FINDINGS

Continuing this process to address the research question, the process described in this chapter of unraveling the data of the seven interviews was required for synthetic consolidation of findings necessary to develop the core theory. The first step towards theoretical development was the open coding process described in the methodology section. The second step was the axial coding process. Describing axial coding, Glaser and Strauss (1967) recommend that the "evidence from which the category emerged is used to illustrate the concept" (p. 23). To illustrate the four interview question categories (i.e., concepts), the following will discuss how the participant quotes (i.e., evidence) blend together to provide "a relevant theoretical abstraction about what is going on in the area studied" (p. 23). Therefore, a purposeful story (i.e., theoretical abstraction) is presented within the analysis of each category.

Analysis and Axial Coding of Categories

The research sub-questions shaped the design of the four coding categories of Coursework, Collaboration, Support, and Distraction. These was examined independently and then with the constant comparative method to discover tenants of the resulting core theory. Axial coding teases out the key points from the analysis discussion and then collapses them into essential contextual factors which will be needed for the selective coding process.

Coursework

The first category examined an area where technology was used to satisfy Coursework requirements. This area gathered 65 quotes and sorted itself into three properties, (1) Technology Required, (2) Technological Tools, and (3) Homework Process.

Category properties.

Technology required. To perform the work required for their classes, the participants

stated that they need technology in the form of a computer and an internet connection to access

several required websites. The main website they access is called D2L (*Desire2Learn*) which is

the college's Learning Management System. This website is the general academic area and

contains the individual course shells the students are enrolled in for each semester. According to

the participants, instructors often use D2L to receive students' homework files or offer

asynchronous discussion areas. Although, Bree made a point in the following transcript excerpt,

that not all of her instructors require online access: "Interviewer: Is there coursework that

doesn't require technology? Bree: Yeah. Statistics … that actually uses the book."

The participants reported that these D2L course shells often have hyperlinks to the

textbook publisher's website for homework. To gain semester access to these websites, the

student will purchase a textbook which contains the access code. If the student purchases the

textbook through some other method than the campus bookstore, they must still purchase the

access code either from the campus bookstore or online, at the publisher's website.

While describing their experiences, all participants emphasized how important it was to

have access to a computer and internet. Larsen spoke with conviction in her voice when she said

"It supports my learning." Rose was rather emphatic with: "I use my laptop more than anything!

The computer is actually the biggest help." Alfonso also described the necessity aspect of his

cell phone with "Not everyone wants a television in their household because of the distraction

that is causes. But a phone is almost a necessity now." He continued speaking on how his tablet

supported his studying with:

> If it's late at night a tablet is actually better 'cause my eyes are more fixated on the idea
> that it's still light out; my brain doesn't want to go to sleep. If I read out of a literature

book, and its low light, and it's late at night, I'll be likely to fall asleep and not retain the information as well. So, that for me … is actually very, very crucial. … I think technology is *now* [emphasis added] a necessity instead of just optional for the modern day classroom.

All participants emphasized how important connecting to the internet through Wi-Fi was to their experience. Rose described her expectations with: "Yes, I do depend on Wi-Fi for most of my schoolwork actually. In my Math class … I couldn't do my Math homework unless I was online." And Bree explained "If there's a wireless problem … There's no more technology for the day." Alfonso agreed with this point by saying "you would need like your Wi-Fi and a good signal to get to the internet."

While Rose was trying to demonstrate the voice activation system of her phone, she lost Wi-Fi signal and the following transcript excerpt describes the difficulty students may encounter:

[she speaks into her phone again] What's the definition of *qualitative*? [seventeen second pause] … [the phone program now speaks:] *I'm really sorry about this, I can't take any requests right now.* … Ohhhh. It depends on what your service is too. I'm not connected to the schools' Wi-Fi right now.

What this means for the participants is that they need technology to perform work in their classes. They consider technology as both a computer (cell phone, tablet, or laptop) and a connection to the internet.

Technological tools. The tools participants reported using varies quite a bit; while they can use the typical home computer, they prefer to use laptops, tablets, and their cell phones to take notes, perform homework, assignments, and communicate. They use either *Mac* or *Windows* based software depending on what they are comfortable with. For basic topic and keyword searching they all reported using *Google* or *Bing* web browsers. During the interview, Rose demonstrated a program called *Siri* on her cell phone to verbally ask it to find definitions

36

and to send text messages. For academic research, Larsen said that they use *EBSCO* or *JSTOR* which are linked through the college's library website.

To perform homework assignments outside of class, they all reported that most of their work is performed online. For math assignments, they use *My Math Lab* which contains homework in the form of quizzes. For Philosophy, they explained how they use the *McGraw Hill Online* program to perform tasks that are similar to taking a guided quiz which requires research through the website and an electronic version of the textbook. Psychology has the same process with its *PsychPortal* website.

For note-taking in class, they again use a variety of methods from writing in a paper notebook, typing on a tablet screen, typing on a laptop keyboard, or typing into their cell phone. They can also save their electronic notes in the internet *cloud* to access for review or reflective comments from home or at work.

Larsen and Rose described how peers in their classes will have a laptop or tablet with a *PowerPoint* displayed and adding notes as the lecture progresses. Alfonso demonstrated how he does homework with several software tools on his *iPad*. The first one was called *Evernote* which he can use in class to type notes while the lecture is presented and then use those notes at home to guide his research. An interesting feature with Evernote is that he can attach audio and photographs. He captures these with his built in microphone and camera.

He continued his demonstration with a program called *My Script Calculator* which converts his finger tip writing into typed math formulas and then automatically solves for the answer. The following transcript excerpt describes this process:

[he drew a simple (2 x 3.3), it typed in the parentheses, augend, addend, then added a

typed equal sign with the answer 6.6] "And you can modify that … and it'll change the

answer for you." [he added in the exponent of 2 with his fingertip to the augend [2] and it

typed a superscript 2 and recalculated the answer to 13.2] .

To read textbooks, he used a link on his tablet called *Kindle* which displayed an electronic

version of the textbook used in class. A unique feature he demonstrated was the ability to

interact with the book. He pressed his finger down on a word, a definition of the word appeared,

and he showed how easy it was to search for that word or any word throughout the book. He

also displayed a map of keywords and where they were found in the textbook.

He continued this demonstration with a website called *Chegg.com* where he can purchase

or rent an eBook or a paper version of the textbook. To show this feature, he tapped on an icon

and the software activated his tablet's camera. Using a math textbook carried in his bag, he

focused the camera on the UPC code until it filled the small window. He did not need to press

anything, the software automatically captured the UPC code and displayed it's availability on the

website. Unfortunately, this particular UPC code did not display a matching textbook. He made

a comment that it was strange because he rented this book from Chegg.com.

After this demonstration, he opened up a program called *My Homework* which is

basically an organizer of all his upcoming classwork in a calendar format. When asked what

software they prefer for typing out their homework documents, they all responded that it depends

on preference; Larsen, Bree, and Rose used *Microsoft Word*, while Alfonso used *Apple Pages*.

Homework process. All participants described their experience of performing homework

on a computer which can be summarized as; log-in to college website, login to D2L, click on

class, click on homework section, click on publishers link, log-in to publishers website, click on

the chapter due, click throughout the answers. It is very interactive although none complained

on how tedious this could be; it was a normal process for all the participants. Larsen explained

the student experience of performing this process rather thoroughly:

> That means you log on to the website for that class and you do all the assignments that are underneath that chapter. A lot of the homework is a multiple-choice selection though some are like fill-in-the-blanks. … My Math Lab is fill-in-the-blank. [she continued with,] … you are going to click the link of the homework assignment basically. Within that link is gonna pop up a secondary page which has questions with answers, maybe multiple-choice. So you would have a question on like, Psychology on Pavlovian Theory and they would give you multiple answers and you would have to choose the one that's right.

Students are required to go online if homework is to be accomplished. All of the participants

stated that they go to publisher's websites such as *Wiley Plus* and My Math Lab for homework.

Homework in this style is similar to a quiz; the homework is graded then collected for the

instructor online.

To access homework, the students access the publisher's website by typing in the web

address in a web browser, or establishing a link on their desktop. Some prefer to go through the

college's D2L portal, and then link through to the publisher's website. At the welcome page of

their homework, Rose described the experience:

> You go to a box that shows a graph of what is due for your class and what assignments
>
> you have completed. If you are doing all your homework, the graph will be like - 100%.
>
> If you are not doing any of it, it will be 0%.

They report that while some homework is research via links through the website and eBook,

most of it is clicking on choices. Bree explained her Accounting homework using *Quantum*

with: "It's all technology. You don't have to type anything really, except for numbers. They

have drop-down boxes for the account titles". Rose explained the learning curve associated with

this style of homework:

If you like, put a space … like, if the answer is *six* [emphasis added] and you put *six space* [emphasis added] it will tell you that the answer is wrong even though you got it right. You gotta put it in the format it wants. It's something you get used to, definitely. But it can be a headache if you don't understand and keep messing up the format.

For textbook reading, Larsen, Bree, and Rose prefer a traditional paper textbook. Alfonso instead prefers using Kindle to display his textbook and demonstrated his experience with this transcript excerpt:

Alfonso: So, I press this button [icon on the screen] and I go to the library of everything that I have. [opens up his Economics e-Book] I can go to the Table of Contents … go to the Cover if I need to.

Interviewer: Is this the whole textbook – like in your class?

Alfonso: This is the whole textbook. This is macroeconomics in a nutshell.

Alfonso and Rose also demonstrated some unique methods of homework. Alfonso demonstrated on his iPad and cell phone how he saves and displays his notes and homework on the internet cloud and can access them anytime when he has a reflective thought to add. Rose demonstrated how she speaks aloud towards her cell phone to find definitions of words she encounters during her homework session. They also use a variety of methods to read their textbook, either on a tablet, or with the traditional paper textbook and demonstrated several methods to use online dictionaries.

Summary of coursework. This category of Coursework sorted out into the three properties of Requirements, Tools and Process. The salient message from all the participants was: They all reported needing a computer and internet access because a majority of homework is located on a website. They believe that technology is a necessity and not an optional tool.

They all require a connection to the internet through Wi-Fi and use a variety of hardware and software tools to research academic material and report findings. It depends on comfort;

they can easily use a desktop, tablet, laptop, or cell phone for their *computer* and use either a

Windows or Mac operating system along with the operating system's unique word processing

software. They all reported their interactivity with software to perform homework, record entire

lectures with whiteboard notes and exhibits; search, highlight, and find instant definitions with

their eBooks. They need a variety of technological and traditional methods to interact with the

homework and also to capture then access class notes.

    Axial coding. Figure 3 displays the key points from this summary of Coursework,
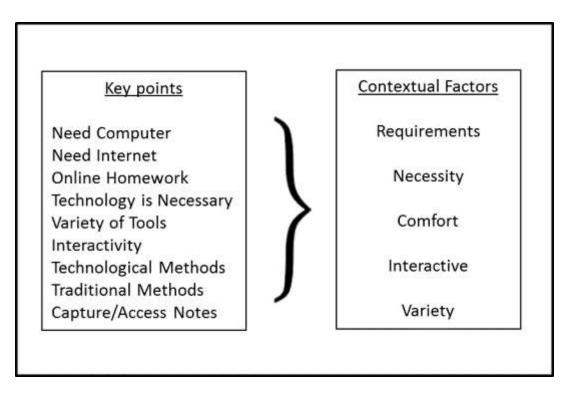
collapsed into essential contextual factors.

  Figure 3. Axial Coding of Coursework category

These categorical contextual factors will be melded with the same from the remaining categories for the emergence of a core theory of the millennial community college student's experience of learning.

Collaboration

The second category examined the area of Collaboration and gathered 15 quotes that became one property, assignment collaboration.

Category properties.

Assignment collaboration. The participants spoke easily about this topic. Assisting each other seemed to be a routine aspect of their culture. They all referred to email and cell phone text messaging as the primary methods of sharing and Larsen mentioned how they share workload on *Google Plus* by uploading a document on that website and the class team would all have access to modify their part of the PowerPoint needed for a class project.

While demonstrating the program Evernote on his iPad, Alfonso described a scenario where his classmate could not make it to Geology class one day; he audio recorded the entire lecture and took photographs of the whiteboard and of the exhibits as this transcript excerpt explains:

Alfonso: … And this one is really good if you have to pass off notes to another student. [he tapped on a microphone button and it is now recording everything we are saying]. So I can stop it, and it'll put that right there [an icon on the screen] and it'll just start playing that back to us.

Interviewer: How is recording a teachers lecture good for passing on notes?

Alfonso: If I take notes for a student but they don't understand my notes, I have the actual audio so they could pick up on something that I was not able to translate onto paper. That helped immensely in Geology and I had a friend in class that I worked with and she needed the notes and lecture audio as well.

Interviewer: Aren't those large files?

Alfonso: They can be. … They can get rather large. I think the largest note I had taken over one course … it was like, 32 megabytes. And that's because I recorded the entire lecture and had about 12 pictures. In Geology, we're talking, … I'm taking pictures of rocks and minerals that we need to study.

Along with assistance, another aspect emerged from these interviews: coordination. The participants described their ability to coordinate upcoming class assignments, teamwork tasks, and other expressions of performing required work for class with mostly cell phone text messaging. Larsen stressed how important technology was to her generation because:

It's kind of an interesting idea; say that we're doing a group project in class and the

teacher only gives us so many classes to communicate with our partners. We would need

to communicate outside of class as well to get the project done.

Bree mentioned that a few of her peers use video chat software such as *FaceTime* or *Skype*. When asked to describe this, she mentioned: "It's like, if you have an iPhone, and they have that little video camera. And you click that and you can call the other person. But instead of just talking over the phone, you can see my face."

While cell phone text messaging is the primary method of coordinating, a few occasionally use email, but often return to text messaging. Rose explained how this evolves:

Last semester, in my Science class, I had a lot of group projects, a lot of labs and they were a lot of work, so you had to do it outside of class. The most I communicated with my classmates was through text messaging with the cell phone. Email in the beginning, but we pulled away from email quickly; we mostly did texting. I think we only emailed a couple of times.

Summary of collaboration. This category of Collaboration sorted out into the one property of Assignment Collaboration. The salient message was: Millennial community college students collaborate on class assignments as a routine of their culture. They prefer to share this

43

workload through cell phone text messaging, but do use email and even video chat if necessary. Instead of photocopying their lecture notes for missing classmates, this generation prefers to simply audio record the lecture and attach photos of the whiteboard and exhibits shown in class.

Axial coding. Figure 4 displays the key points from this summary of Collaboration, collapsed into essential contextual factors.
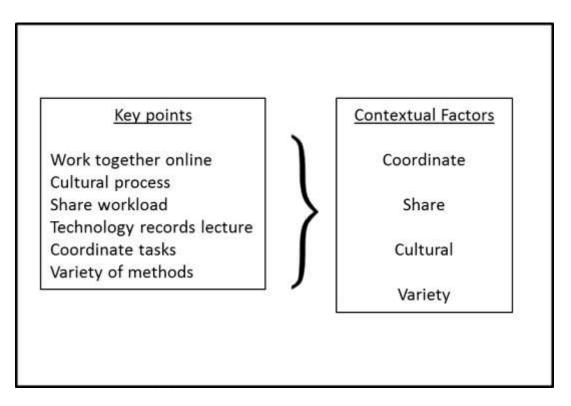

Figure 4. Axial Coding of Collaboration category

These categorical contextual factors will be melded with the same from the other categories for the emergence of a core theory of the millennial community college student's experience of learning.

Support

The third category examined an area where technology can provide Support. It gathered 36 quotes and sorted itself into three properties, (1) Organization, (2) Research, and (3) Tutoring.

Category properties.

Organization. To keep track of the tasks and events in their lives, all participants described how they use technology to stay organized. There were thirteen quotes in this property and these sorted into two aspects: managing events and maintaining control of their administration requirements.

Larsen explained how she used text messaging to coordinate with peers for upcoming exams and papers, whereas Alfonso relied on software programs such as Evernote and My Homework to maintain this information. Rose explained how she accessed an online calendar through Google with her laptop and cell phone. Bree explained how important email was in her classes to receive updates from the instructor.

For general administration of classes, they all explained how they rely on technology to discover the classes available in upcoming semesters along with the required textbooks that Alfonso orders online but the other three participants prefer to purchase in the college bookstore. All four participants explained how important technology was for their FAFSA applications and notifications. Alfonso detailed his reliance on technology with:

> So, without that, there's a chance that I can make more mistakes. Technology keeps me on top of my game. There's alarms that I can use that I can make sure I can get there … like this meeting. I may not have gotten here this morning if I didn't have my alarm set at 8:00 AM. Or, if I just wrote it down on paper, I may not have checked that piece of paper because maybe it got lost or something like that. Paper is not nearly as valuable as a $300 device that constantly updates and constantly notifies you that something is happening. So it's … paper is still going to serve a great purpose, but technology goes out of its way to help you. Paper is more stagnant, where you have to force yourself to help yourself.

The participants rely on technology for support in managing events and staying up-to-date with college requirements. It appears to be a cultural norm; not a special event.

Research. When asked how technology supports their education, Larsen, Bree and Rose focused on research requirements. The participants consider the use of technology to be a normal tool for research. Bree explained that "there's a lot of research you have to do." Larsen further described this requirement with:

> It gives us a much broader field to explore and to do research. It's very beneficial because instead of just learning just from, you know, the textbook, you can use other sources to refine what you've learned and support it.

Rose described her process of research as:

> If I have a couple of questions I do not know, if there's information I'm not clear about, I can go onto Google most of the time … and Google-it and see what pops up on the web. I use that to further my knowledge.

Larsen, Bree, and Rose regarded their cell phones as the normal method of finding information. Larsen detailed this with:

> Sometimes we use cell phones to do quick research in case we are asked something in class. So … somebody will whip out their phone, type in the word, idea or question, and bam! It's right there, ready to go.

Tutoring. The four participants described how the publisher's websites such as Wiley Plus, My Math Lab, and Quantum offer tutoring during homework sessions. Online homework is an interactive process of questions and answers; the answers require the student to type, click, or press an icon on the tablet. When asked if homework is similar to a quiz, Larsen answered "In a way it is, but it's also testing your knowledge as well as assisting your learning." This

46

assistance feature with online homework appears to be beneficial to the participants based on their rich descriptions of the process.

In the homework sessions, the software will ask a quiz-style question; if the student provides an incorrect answer, the software will often provide support. In My Math Lab, Larsen explained how she uses the *Show Me An Example* box and how the software opens a new window with a similar problem and then solves step-by-step with the student. Bree explained how an incorrect answer in Wiley Plus will provide a link to the online textbook page. She continued on with explaining how Quantum will offer practice sessions prior to an online exam: "There's extra activities … there's Quantum – it's called in Accounting. It just goes through question over question of the same thing just so you know the process of it."

Bree continued describing this tutoring process with: "If I don't understand the question, I would have to go see a tutor; with this … it automatically has a tutor in it." Her experience with My Math Lab was:

> I click on Show Me An Example and it shows me an example of the same type of problem and I can follow their example with my problem. If I don't understand a problem, they help me solve this problem and do it step-by-step [bangs on the table] and you do it with them on solving the problem.

Summary of support. The salient message was that they rely on technology for support in their academic studies. They described the necessity to coordinate tasks within their teams in order to complete group projects. They need to remain up-to-date with their online calendar for class activities as well as college administrative activities such as signing up for classes and financial aid information. They consider technology as a normal tool to accomplish research and often use multiple sources. They are comfortable with research on many forms of technology such as cell phones and tablets. They spoke easily on how online software guides them through

47

problem solving; especially in math studies. They described the benefit of online tutorials in a

matter-of-fact, routine way.

       Axial coding. Figure 5 displays the key points from this summary of Support, collapsed

into essential contextual factors.

Figure 5. Axial Coding of Support category
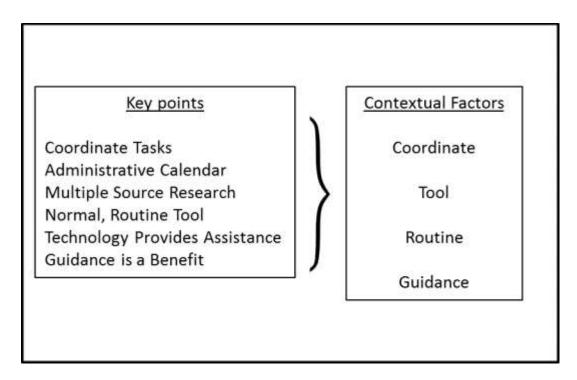
       These categorical contextual factors will be melded with the same from the other

categories for the emergence of a core theory of the millennial community college student's

experience of learning.

Distraction

       The fourth category of Distraction gathered 28 quotes and sorted itself into three

properties, (1) Peer communication, (2) Interest, and (3) Avoidance.

Category properties.

Peer communication. "Staying social" as noted by Bree was the key reason for constant interruptions throughout the day. Rose agreed with this calling it a "social aspect" that requires a back-and-forth episode of communication. Most of the participant's peer communication occurs on their cell phone. Rose explained this process with:

> I find that I can be on my phone a lot. If I'm on Facebook, I sometimes forget time and how much time I'm on it. I can procrastinate on my schoolwork because I'm distracted. The social aspect of always having it there; someone texts you or calls you … can be distracting. I get a lot of text messages from friends. … There's *Snapchat*, which is like this photo messaging, so they send a photo of what they're doing and you're supposed to send a photo of what you're doing. And you keep doing that back and forth ... it's very time consuming.

The participants described how their social network could interrupt them while in class. Larsen described this experience:

> So having a computer in front of me in class is actually very confusing, … not confusing, very … problematic only because I get tempted to search on other sites and go onto email and Facebook and other sites that are not related to what I need to learn. 'Cause … there is that temptation to, ya know, log into the internet and check your Facebook, and *Pintrest* which is a picture site.

Interest. The participants spoke easily about how their technology interrupts their routines mostly because they are interested in the interruption. In the classroom, Larsen explained that if the instructor "goes on a rant, they'll flip to Candy Crush which is a Facebook game, and they'll play that and the teacher will come back and they'll flip back to their Word document taking notes again." Alfonso and Rose demonstrated how they could easily swipe their cell phone or tablet screen to display many icons which link to games. Also, there are notifications which chime or vibrate their cell phones or tablets. These notifications are mostly customized for the news they are interested in. Alfonso explained:

> If you have a website like Facebook, it's very, very, very easy for us to get distracted by loved ones that are having kids, or getting married, or funny pictures, or someone sending

49

you the most recent political blog, or whatever it is, that's another distraction. If you're just trying to take a 5-minute breather from class, that 5-minutes will easily, easily turn into a half hour. Because you find an article, and you read the article, that's 15-minutes, and then you get out of the article and scroll down and down to see the next news feed.

Outside of class, the participants described how easily they can get distracted with family and friends sending comments along with Sports and News web pages sending "a never ending cycle of updates," as Alfonso explained. He went on to describe how his phone "constantly vibrates with new messages" but leaves it turned on because he is interested in those messages. Bree explained the volume of distractions she receives with:

> There's a lot of pop-ups that come up when you're researching for a paper or your friend tells you to go look at this website or you'll get emails and you'll look at it on your phone. I mean, my phone can be one of the biggest interferences I deal with because it's constantly, constantly going off because my email goes to it.

Avoidance. While the participants are distracted by their social network and interesting news, they spoke of how there seems to be a self-imposed discipline among their peers. Larsen explained how many of her friends will purposely avoid their cell phones and "resort to taking notes by hand" or have a laptop or tablet " specifically for their classes. They have material on a smaller laptop instead of a regular computer that they use specifically for class notes and homework." Alfonso became rather passionate on this topic during the interview and had the most to say regarding avoidance:

> Interviewer: Could technology be a distraction in education?
>
> Alfonso: Absolutely! First and foremost, that's the biggest gap you have to get past is the distraction. … I think when you have to go home and you have to actually focus on the work, you … set certain necessities aside, and if you don't, it will be reflected in your grade. You 'will' [emphasizes voice] see a difference. I can't do that; I need to focus as much as I possibly can; because … if I get lost in another thought process from a notification on my phone … [waves hand horizontally, loud voice] that's it! I'm out. [voice normal] I will not retain any memory of learning in that experience. So, a small distraction like a pop-up can really impact your learning.

Summary of distraction. The salient message was that they consider their social network very important and maintain a strong interest in the latest news from their friends. They remarked that their cell phones constantly buzz with a text message or from an interesting news feed. While in the classroom, many of their peers will switch to online games when they lose interest in the discussion but can quickly come back to note taking when their interest resumes. Most of their technology has numerous links to games, news, and chatting options. The category of distraction exposed an interesting view into the millennial culture. It appears they can avoid distraction when they want to. They realize and clearly articulate how their technology can easily distract their concentration, yet fully understand that distraction can occur and often avoid this with a self-imposed discipline to avoid technology when they need to concentrate.

Axial coding. Figure 6 displays the key points from this summary of Distraction, collapsed into essential contextual factors.
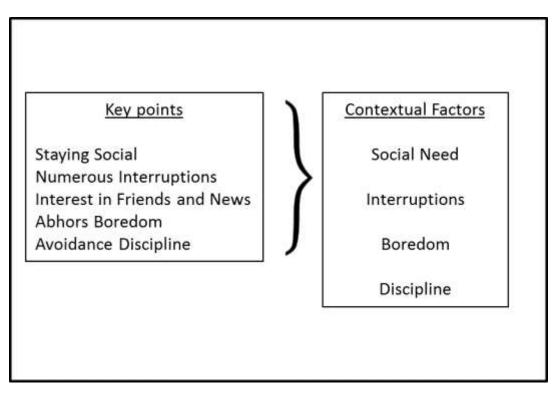

Figure 6. Axial Coding of Distraction category

These categorical contextual factors will be melded with the same from the other categories for the emergence of a core theory of the millennial community college student's experience of learning.

Interesting

During the separate interviews, the participants offered many comments that were related to, but existed outside of the narrow categories of investigation. These comments were collected and analyzed to provide a richer background into how these students make meaning of the experience of using technology for their course work. This fifth and final category of *Interesting* gathered 41 quotes and sorted itself into three properties, (1) Traditional learning, (2) Cultural comments, and (3) No technology.

Category properties.

Traditional learning. All participants added supplementary comments to our topical discussions regarding preference for non-technological studying techniques. Larsen said "I'm more of a traditional learner, I learn better by being in class and doing things in class." Bree also commented: "I particularly love having books in front of my face, I don't really learn off of an internet screen." She continued explaining this with:

Yeah. In my group of friends, some of them are just like me where they like having that book right in from of them to learn and to read off of. I mean, you can mark in there … and you can mark on your computer too, but it's not the same.

While speaking on technology, there were a few comments regarding the fact that not all millennials use technology for everything. Rose commented, "I'm less tech savvy than a lot of

people I know." She said that it was a mix of preference in her group of friends. Bree concurred

with, "Everyone thinks that technology is the only thing that we rely on. But it's not the only

thing. The majority, yes, but there are a good percentage that don't like technology."

Along with studying paper textbooks and notes, Bree and Alfonzo highlighted another

aspect of traditional study habits. They mentioned that group study often involves their peers in

face-to-face meetings. Bree mentioned "I get a lot more work done when it's face-to-face

because it's [knocks on desk] down to business. When it's over a phone, you tend to have more

distractions around you." Alfonso supported Bree's comment with:

> I have yet to use Skype or any kind of chatting interface. It's still best to meet face-to-
>
> face, 'cause I feel like there are certain aspects that can't be shared over a camera. … I
>
> think most people prefer face-to-face.

Cultural comments. Throughout the four interviews, all participants offered comments

regarding their generation's culture. Alfonso exposed his generation's acknowledgement of their

busy lifestyle:

> But, in today's society, schedules are way more complex and dispersed unevenly
> depending on what your lifestyle is. 'Cause college isn't exactly the full-time student
> that has a part-time job on the side, especially at a community college like this. You're
> dealing with people that are more so … fixed on that they have an income, that they have
> to provide for their family or, for whatever lifestyle they have, and that comes first. But
> class is still extremely important, so that comes later.

Each of the participants seemed to take for granted that their peers use technology

constantly and it does not seem to be an interruption in their social circles. When asked if using

technology within their peer-group was acceptable, Alfonso answered: "Absolutely, no one has

an issue. And it's easy for me to pass it [holds up his tablet] around if I need to show something

to someone on a certain page." Larsen agreed with this sentiment:

I think that it's so built into our generation that it doesn't even faze us as it does with …
your generation [laughs]. Yeah … my generation grew up with technological advances
and different types of technology coming out every year. So, we're more used to
technology 'cause it's been in our lives – for most of us, since the day we were born.

Rose explained that when she is among friends, she will verbally ask her phone to text

someone and demonstrated how she uses her cell phone to send text messages in this transcript

excerpt:

Rose: So, instead of calling now-a-days, most people text. I guess it's less personal, but

it's like, you don't have to pull away from something to talk to someone. So I'll say their

name …

Interviewer: … you 'say their name'?

Rose: I'll use Siri again, [she's pulling out her phone and now she's going to say a name]

Text John [pseudonym, eleven second pause] …

Cell Phone: *OK, I can send a message to John Doe* [pseudonym] *for you. What would*

you like to say?

Rose: Can you tell him to call me? [four second pause]

Cell Phone: *Ready to send it?* [the phone program displays a text message with 'Call

Me' in the message box]

Rose: Cancel it please. [the phone now closed the program]

Millennials are comfortable with talking to a computer as if it were a sentient being.

Many have had this interaction with technology since they were born. They have a unique

perspective of what a computer is supposed to be. When asked to define what she means by the

term *computer*, Larsen giggled and answered:

What I mean by "I use a computer" [makes quote signs with her hands] is I use different
types. I can use the regular stand-up box computer that you guys are used to. I can also
use a laptop from my home as well. There are many other students who use tablets and

iPhones as you mentioned for looking up information as well. It's just specific to the person and what they are comfortable with.

Alfonso had a similar answer in this transcript excerpt:

Interviewer: By *computer*, quote-quote, you mean…

Alfonso: The box thing, yeah.

Interviewer: Is that becoming obsolete in your generation?

Alfonso: Absolutely! Tablets almost completely allow us to … prepare a presentation, paper, whatever it is, and I can send it to my Gmail account. Then in class, I can use whatever computer they have, and bring it up to show the class. On the iPad, you can even get an adapter to plug right into a projector to show everyone.

Rose wrapped up this exposure into the millennials view on technology with:

I have my cell phone everywhere I go. I'm like, I have to have my cell phone. If I don't have my cell phone, I feel like I'm disconnected from everything. I don't know any of my friends who just leave their cell phone at home. As a server, I notice people at restaurants; the whole time eating their meal with their friends and family, all on their cell phones. So I think that's how the generation is progressing more. They're more on their technology than they used to be.

No technology. To determine how invasive technology was in the millennial culture, I asked each of the participants: *If the State of Colorado put out an edict across the land that said 'no more technology allowed' for college, what would happen?* All four participants displayed a slightly stunned reaction and began their responses in choppy, carefully chosen words.

Excerpt from the interview with Larsen:

Interviewer: … no technology allowed …

Larsen: Oooooh! … [interrupts, eyes wide open]

Interviewer: … for college. Tell me how this would affect your generation.

Larsen: Well … specifically for my generation we're very … 'addicted' [makes quote signs with her hands] to technology. It's basically very difficult for us to walk outside our house and not have – ya know – our cell phones, iPods, laptop, tablets, whatever, because we're so attached to that technology; it's … what we've grown up with … Because … we've become so attached to simply typing out a paper in 20 minutes on a

computer rather than spending two hours writing 'neatly' [makes quote signs with her hands] on paper. … It would be a hindrance to our learning because we grew up with it. So taking it away – *[laughing, unintelligible]* life necessities from a child!

Excerpt from the interview with Bree:

Interviewer: … no technology allowed …

Bree: Oooooh! …[interrupts, sits up in chair]

Interviewer: … for college. What would happen?

Bree: … I think it'd be crazy! … I do everything on the internet! [waves hands] There's … not much I do on a piece of paper anymore unless it's required. I'd have to go to books to do my research and most kids don't know how to do research in a book anymore. I stopped using books when I was in seventh grade!

Excerpt from the interview with Alfonso:

Interviewer: … no technology allowed for college. What would that be like?

Alfonso: [long pause, staring, thinking] I would resort back to … the … paper style of … organization, and in fact I have never been very well organized when it comes to keeping separate items together. If I'm allowed to have just this one piece [holds up iPad] that I need to maintain and organize, well not even organize, [voice getting excited] I just have to make sure I don't lose this one piece [slightly waves tablet in cadence with his words]. [voice back to normal, tablet back on table] I … am forced to keep scattered papers in a folder, it's … I'm less likely to take time out of my day to organize all those papers into what makes sense.

Excerpt from the interview with Rose:

Interviewer: … no technology allowed for college. Can you describe that scenario?

Rose: [slight pause, thinking, crosses arms] I think we … would be stepping back into the Stone Age because technology helps us to progress and be creative.

Summary of interesting. The salient message was that it would be incorrect to

generalize this generation as completely connected to a computer all the time. Millennials do

embrace some version of traditional study methods. Most prefer to study a paper textbook and

have face-to-face group meetings yet find technology necessary to perform homework online with tutorial assets because of their busy lives. It is not considered offensive within this culture to be in a group setting and use personal technology while interacting within the group. Further, they consider a computer to be any device that connects them to the internet and are proficient with a variety of these tools. A cell phone is a necessary part of their lives; they feel disconnected without it, even while amongst friends. When referring to the technology in their lives, they use terms such as Addicted, Attached, and Grown-up with. When considering life without technology, they used terms such as Hindrance, Life's Necessities, and Stone Age. They realize their inter-personal communication is different from previously generations, yet do not see this as being a problem; it's a cultural acceptance. Finally, they embrace technology as a significant part of their lifestyle to remain connected to their social network and to maintain efficiency in their busy lives.

Axial coding. Figure 7 displays the key points from this summary of Interference, collapsed into essential contextual factors.
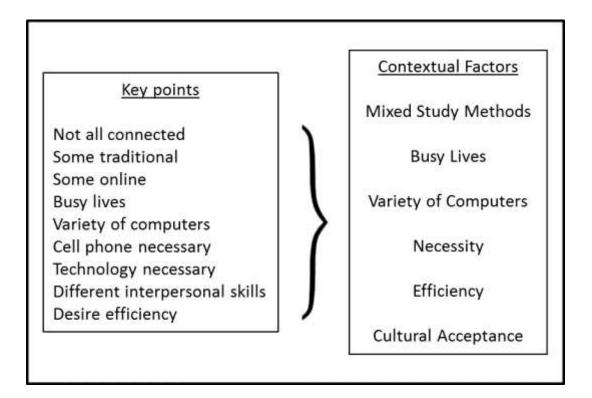
Figure 7. Axial Coding of Interesting category

These categorical contextual factors will be melded with the same from the other categories for the emergence of a core theory of the millennial community college student's experience of learning.

Selective Coding

Selectively gathering the contextual factors from the axial coding process assists in the development of core categories from which the core theory is developed (Merriam, 2002, Strauss, & Corbin, 1998). To "discover" (Strauss, & Corbin, 1998, p. 149) these core categories, the authors suggested the creation of descriptive stories to identify a salient concept that all categories relate to. This continuation of funneling data requires an answer, in the form of descriptive stories, to each of the interview questions, then the research sub-questions, then finally the research question. This process is a reversal of their respective development.

Descriptive Stories

      Interview questions.

      How do you use technology specifically for your coursework?

      Contextual Factors: Requirements, Necessity, Comfort, Interactive, and Variety.

Most of the participant's homework and exams are on a website and they need both a computer device and a reliable internet connection to perform these highly interactive required class activities. They use a variety of traditional and technological methods depending on what they are comfortable with, to access, capture, and share data required for assignments.

      How have you used technology to collaborate with classmates on class assignments?

      Contextual Factors: Coordinate, Share, Cultural, and Variety.

In the classroom, they use a variety of methods to take notes; from paper and pen, to annotation of lecture PowerPoint, to audio recording entire lectures with attached photos of the whiteboard and exhibits. Outside of class, they have a culturally accepted method of working together in person or online where they share workloads and coordinate tasks.

      How does technology support your learning?

      Contextual Factors: Coordinate, Tool, Routine, and Guidance.

They rely on technology as a tutor during their homework sessions; they see this feature as a benefit and convenience. They consider a computer as the normal, routine research tool and often search multiple sources quickly. They rely on technology to coordinate tasks in their personal lives and as an administrative assistant to remind them of their multiple class schedules.

      How does technology interfere with your learning?

      Contextual Factors: Social Need, Interruptions, Boredom, and Discipline.

The participants abhor boredom, have multiple interests throughout the internet and have a need of staying social. They seem accustomed to receiving an almost constant interruption of emails and text messages throughout the day. They have developed an awareness and discipline to avoid distractions when study time is crucial.

Interesting

Contextual Factors: Mixed Study Methods, Variety of Computers, Necessity, Efficiency, and Cultural Acceptance.

The participants exposed that their generation is not 100% connected to the internet all day long; they vary with traditional and technological methods to study. They are adept at using a variety of computers and consider the word *computer* to be any device that connects them to the internet. They believe technology is necessary for college. Their culture has a different interpersonal skill from previous generations; they can text or look at interesting internet pages while in group settings without being considered rude. They need efficiency from their technology and feel it is necessary to have their cell phones with them all the time.

Research sub-questions.

Since the interview questions were developed to answer the research sub-questions, the descriptive stories will be merged to answer each sub-question. The interview questions of Coursework and Collaboration were developed to answer the first research sub-question regarding technology for learning, therefore the two descriptive stories will be merged to discover its unique answer. The interview questions of Support and Distraction were developed to answer the second research sub-question regarding the millennial community college student's natural use of technology, therefore the two descriptive stories will be merged to discover its

unique answer. The category of Interesting will be blended into the two research sub-questions

depending on the support they offer to each question

What tools do they naturally use to study college-level material?

They use a variety of traditional and technological methods to study, research, and

capture notes and share these records with their peers. They prefer to have face-to face group

meetings, but because of their busy lives, they can easily coordinate workloads and tasks online.

To interact with their mandatory websites for interactive homework and exams, they must have a

computer device, and a Wi-Fi connection for access to the internet and need efficiency from the

technology they use.

What is their experience of learning outside of class?

They consider a computer as the normal, routine research tool and often search multiple

sources quickly and rely on software for tutoring during homework sessions. They are drawn to

distraction through the nearly constant flow of messages their cell phone receives from their

social network and websites of interest but maintain a certain discipline to turn off their cell

phone when they need to focus on studying.

Theoretical Elements

To answer the research question, Glaser and Strauss (1967) recommended a different

approach of analysis at this point in theory generation. Using their "Theoretical Elements Chart"

(p. 42), the data from the research sub-questions is again pulled apart and sorted into Categories,

Properties, and Hypothesis as seen in Figure 8. These specific, systematic steps will inductively

clarify the true elements required to answer the research question (Creswell, 1998).

Elements of Theory	Substantive Area: Millennial Community College Student			
Category	*Necessity*	*Variety*	*Efficiency*	*Distraction*
Property of Category	Tutoring Benefit Coordinate Tasks Online Homework Online Exams Share Notes	Routine Tool Multiple Types Convenience Face-to-Face Online	Comfort Flexibility Interactive	Constant Interruptions Multiple interest Staying Social Awareness
Working Hypothesis	The more online requirements they have, the more benefits they need from computers.	The more online requirements they have, the more flexibility they need to use the multiple tools they are used to for coursework.	The more interactive the online classwork becomes, the more flexibility they need to use whatever they are comfortable with.	The busier their lives become with interests outside of school and their social network, the more interruptions they receive throughout the day which they counter with an awareness and avoidance discipline.

Figure 8. Theoretical Elements Chart

To integrate these reduced data, Strauss and Corbin (1998) recommended reducing the working hypotheses into sets of relational statements to explain generally "what is going on" (p. 145). They advised using "When these series of events occur, then…" (p. 145) types of statements. However, before Strauss and Corbin's (1998) method can be applied, Creswell (1998) recommended a process shown in Figure 9, to clarify the "components" (p. 58) necessary in the wording for the core theory.

Component	Key Words
Central Phenomenon	Use of Technology
Causal Conditions	Research, Online, Group
Strategies	Variety of Technology
Conditions	Must have Internet
Consequences	Efficiency, Flexibility

Figure 9. Theoretical Components

Core Theory

Gathering the salient messages from the working hypotheses and theoretical key-word analysis, the core theory to the research question, so far, is:

What theory explains why the millennial community college student needs technology for learning?

When the millennial community college student performs the requirements of research, interactive online classwork, and group collaboration, they need access, efficiency, and flexibility in the variety of technological tools they need to meet these requirements.

This is the core theory from which more interviews will validate or modify until saturation occurs. There were many other topics that could have been considered in this singular answer, but Strauss and Corbin (1998) suggested trimming these away by stepping back and reviewing the essential elements of the research question. They state, when faced with interesting but extraneous topics: "Our advice is to drop them" (p. 159).

Fieldwork re-commenced in March 2014 to find more students to interview. The next series of interview questions were different from the first set. This core theory was an "abstract rendition" (Strauss & Corbin, 1998, p. 159) of the raw data and was validated with new interview data to discover any variations in the core theory when applied to the millennial

community college student. Therefore the next series of new, open-ended, inductive questions were based on the variables of, classwork requirements, collaboration requirements, and both efficiency and flexibility in technological tools.

In this phase of theoretical development, the new delimited set of variables allows for focused constant comparison of interview responses. The goal is to discover a "new aspect" (Glaser & Strauss, 1967, p. 111) that can modify the core theory.

The fifth interview was conducted to measure the new data against the core category. Under the topic of classwork requirements, Bob stated that he primarily uses technology to access his online class group discussion and communicating with which agreed with the first four participants. In the topic of Collaboration, he agreed with the prior interviews with details of logging onto his online class requirements and group discussions. It was during the topic of Efficiency and Flexibility that a new aspect emerged.

Prior to the interview, Bob self-identified through email that he was born at the leading edge of the millennial generation. His interview responses alluded to a different expectation of efficiency. He prefers more of an immediate response to online group discussion postings. This seemed in opposition with Alfonso and Rose. Both demonstrated a lack of stress when technology failed to respond. This aspect exposes the range of patience towards technology. The older millennials expect faster responses, where the younger millennials are nonplused with delays.

Reviewing all interviews, there appears to be a dividing line between young and old millennials; the age of 25 years old seems to be a delineation all five participants expressed. However this seems to be only for expectations of technological response speed. When asked if this delineation of age denoted different skill sets, Bob said "I don't see much of a difference at

all. We were all raised with computers; all of us. Even in Kindergarten; I had one of the first Mac's." The result of this fifth interview saturates the core theory and will not change the wording, but will add to the universe of trivia that surrounds the core theory. The younger two-thirds of the millennial age range seem to have more patience with delayed responses.

To determine saturation of the core category, a sixth interview with Corey was accomplished asking questions regarding classwork, collaboration, efficiency and flexibility. Corey's answers agreed with the previous participants, he considers his computer and online access essential for his online classwork and also requires flexibility to do his work late at night or anywhere with his cell phone.

While discussing collaboration, he agreed with Bree that he prefers to "jot down notes on paper instead of on a computer." He noted that with paper, he does not need to worry about formatting the text and finding a printer. And like Bree and Rose, he prefers to have face-to-face group sessions instead of doing the same task online.

One interesting point he made was that there will always be a difference in technology skills in every generation. He said,

> I just have one thing to add; I'm 20 years old, there's 8-year olds that probably know how to use the new technology better than I do. It will always remain that way. There will always be a significant difference in technology use between the young and old of any generation.

Corey's input will not change the core theory but does reinforce the notion that the millennial community college student requires internet access and uses a variety of methods to perform classwork. Additionally, it appears that if academia solves the current problem with content delivery for current students, it will become obsolete for the next generation of students.

Continuing on with the search for new features that will modify the core theory, a final, seventh interview was accomplished with Jeff asking similar question presented to Corey and

65

Bob. Jeff's answers agreed with all participants on the topics of classwork and collaboration. For efficiency and flexibility, he mentioned that he prefers the flexibility of taking classes when he is on vacation with his family during the summer. This final interview did not change the core theory and I believe that it is now saturated.

Theoretical Saturation

Glaser and Strauss (1967) provided a target for theoretical saturation of the core theory. They offer (p. 113):

> When the researcher is convinced that his analytic framework forms a systematic substantive theory, that it is a reasonably accurate statement of the matters studied, and that it is couched in a form that others going into the same field could use – then he can publish his results with confidence.

Constant comparisons of the second series of interviews against the core theory established that there was nothing new to be added to any aspect or verbiage of the theory. Strauss and Corbin (1998) clarify *theoretical saturation* with: "This term denotes that during analysis, no new properties and dimensions emerge from the data, and the analysis has accounted for much of the possible variability" (p. 158). Merriam (2002) added to this clarity by stating that the core theory "accounts for most of the variation in the phenomena" (p. 149). Finally, Creswell (1998) proposed that the core theory is saturated when "the theory is elaborated in all of its complexity" (p. 57). Considering that data from the second series of interviews have not added modifications, it can be determined that this is a reasonably accurate statement that accounts for most of the variability in the phenomena of technology usage by the millennial community college student. Therefore, I will safely assume that the core theory has reached theoretical saturation.

Conclusion

The core theory in its current form is: When the millennial community college student performs the requirements of research, interactive online classwork, and group collaboration,

they need access, efficiency, and flexibility in the variety of technological tools they need to meet these requirements. While the constant comparative techniques have validated this category to a wide range of variability within the millennial community college student's experience, it is still in need on one more technique to become the substantive theory.

According to Glaser and Strauss (1967), a secondary literature review is required to qualify the substantive theory. They argued that, "late insights should be fostered deliberately, for they can enrich the theory by forcing elaboration and qualification" (p. 253). Therefore, in Chapter 5, a discussion of the core theory against the literature will expose any elaborations necessary to finalize the core theory into the substantive theory.

CHAPTER 5: DISCUSSION

Overview

This discussion will present a summary of the background of this study along with its purpose, methodology and analysis. The substantive theory of this study was developed and additional facts gleaned from both the literature and emergent findings developed into research topics for further study in the field of millennial studies. The conclusion will close this study and highlight any contribution attained.

Background

Millennial college students have a different approach to learning than previous generations because a majority of this generation was raised with various and rapidly changing forms of computing and connection to the internet. This generation naturally uses technology to communicate, collaborate, and to learn (McCoog, 2008; Nikirk, 2009). Their expectations of interactivity in the collegiate classroom were shaped by the rapid response of online media and from their primary and secondary educational experience where they were introduced to educational software and collaborative problem solving. Millennial students who attend community college share these traits, but often approach their education with a unique set of stressors which requires reliance technology more so than their 4-year university counterparts to stay abreast of their academic studies (Mullin, 2012; Pusser & Levin, 2009).

Purpose

The intent of this study was to discover the voice of millennial community college student as to why they use technology for academic work. The qualitative research method of grounded theory was employed to discover this unexplored area of the millennial student genre. Interviews were conducted and grounded theory techniques distilled their responses into a theory

which provided a possible answer to the research question: What theory explains why the millennial community college student needs technology for learning? Also, sub-questions that provided some focus were: a) What tools do they naturally use to study college-level material? and, b) What is their experience of learning outside of class?

Methodology and Analysis

After a review of the literature, the research question was established and it was decided that grounded theory would be the best choice as a research methodology because this specific area has yet to be explored. Interviews were conducted at the Rampart Range Campus of Pikes Peak Community College in Colorado Springs, Colorado. Seven students were interviewed in total. After the first four interviews, similar thoughts in answers were detected and using Atlas *ti*, the grounded theory techniques of open, selective, and axial coding distilled their interviews into a core theory. Subsequent interviews were conducted to discover if the core theory was saturated or if there needed a revision in the wording or context of the theory. It was determined after the third subsequent interview that nothing new was being added to the theory. As required by the grounded theory method, a second literature review was conducted on the tenants of the core theory to assess its soundness and validity. At this point, nothing new was added to the core theory and therefore became the substantive theory which provided a possible answer to the research question and nine salient finding.

Findings

Hidden within the participant's interview responses, is commonality of concern and expectation of using technology for academic endeavors. Constant comparative techniques distilled these responses into nine salient findings which formed the basis for the resulting theory's development.

To summarize, the nine findings from this study were:

1. There is a relationship between the requirements of classwork and their need for technology to fulfill those requirements.

2. The participants have been using educational software since elementary school.

3. Online education is quickly becoming an integral function of the twenty-first century collegiate landscape and the participants are taking advantage of this capability because of the role-conflict that prevents full-time university attendance.

4. The participants were born into the world with technology always available.

5. The participants have a variety of skills in using technology, but they all experienced the process of successful online classwork solutions.

6. The participants spoke easily and comfortably on how they collaborate with their ad-hoc class teams to solve a problem.

7. The participants use a variety of technology and have variation in how they access online classwork content. Some use a box-style desktop computer, while others can easily switch to the laptop, tablet, and even their cell phone. It depends on what they are comfortable with using.

8. All participants discussed how difficult performing classwork can be when they lose Wi-Fi signal. Some remarked that they simply end their session and access it another time.

9. The participants face a constant barrage of interruptions from their personal technology, yet they seem unfazed by it.

As a list, these findings do not provide information to the field; however, when combined into relevant topics, they developed two key points for consideration: a) an evaluation of the cultural use of technology and b) the necessity of having technology as part of the millennials academic experience.

The culture of millennials was exposed throughout the interview responses. They have been using educational software since their early years and claim that it was always available to them in many aspects of life; both academic and social. A unique feature of this generation's culture is that they are comfortable with collaboration of their assignments and can easily use any platform (cell phone, tablet, laptop, desktop computer, etc…) to access their online classwork. What was surprising was the discovery that the participants do realize that *distraction* is a significant part of their culture yet seem unfazed by it. All of the interview participants discussed their self-regulation of avoiding distraction and seem to consider it a cultural norm. The following discussion on these findings will consider current literature as a means of adding to the body of the millennial generation genre.

Cultural Use of Technology

Adult learning is a focused dialogic process; either with a teacher or with the twenty-first century surrogate, educational software. The findings from this study discovered that the millennial community college student has been using educational software since elementary school. This agreed with the research of Becker (2009), Berk (2010), and Chung & Jackson-Vincent (2012) who suggested that these students consider the uninhibited use of technology as a necessary tool to perform college level work because the educational world they grew up in was replete with cell phones, computers, game-style educational software and access to the internet.

The driving forces for change to academic delivery methods are the technological talents and demands of millennial students. The research of Berk (2010) and Vincent (2012) agreed with the study's findings and discuss how the millennial students were born into the world with technology always available. Other research found that many of these students had cell phones at an early age and are continually connected to the internet and their global network of friends and newsfeeds (Behrend, Wiebe, London, & Johnson, 2011; Berk, 2012; Sandars & Morrison, 2007; Vincent, 2012). Non-technical research from Jackson (2012) and Stone (2011) disagreed with the findings. Jackson (2012) found that 76% of university millennials report that having a phone can be distracting for academic studies and Stone (2011) discovered an area called "Semi-Sync" (Stone, 2011, February 7) which referred to the condition of having a "Continuous Partial Attention" (Stone, 2011, February 7) to technological news sources and social media while performing routine tasks. Both Stone (2011) and Jackson (2012) concluded that these conditions increase stress in college students.

However, an interesting finding in this study reveals how millennial community college students use a variety of technology and has variation in how they access online academic content. Some use a desktop computer, while others can easily switch to the laptop, tablet, and even their cell phone. There was no indication of a trend and simply depends on what they are comfortable with using, thus limiting stress. The research of Hornak et al. (2010) supports this and added that the cellphone is rapidly becoming a "principal interface" (p. 85) for millennials to access their classes. Additionally, colleges are now pushing timely administrative reminders to students via their cell phone along with flashcard apps in their courses as a cell phone study aid (Hu & Driscoll, 2013; McAlister & Crappell, 2014).

Research from Charsky et al. (2009) and Emanuel (2013) disagreed with this study's findings on the note of how millennials are not better at online based classwork. However, their studies focused on a limited set of tasks with a limited software platform which developed the need for tutoring. Berk's (2010) research disagreed with the position of Charsky et al. (2009) and Emanuel (2013) and supported the findings with "their world is not better than or inferior to ours; it's just different" (p. 3). Additionally, a two-year study by Jones and Hosein (2010) found millennials maintained a strong use for Microsoft® Word and Excel. The study's findings did discover a variety of skills in using technology, but they all experienced the process of successful online classwork solutions because of their flexibility in mastering software and hardware platforms.

Research from Coomes and DeBard (2004); Hooker (2002), Lippincott (2010), Oblinger and Oblinger (2005), and Vincent (2012) added credence to the study's findings as they discussed the millennial generation's collaboration skills. Their research indicated that millennials find collaboration a "safe, non-threatening, non-competitive setting" (Hooker, 2012, p. 221), and that they naturally work in teams via technological tools such as text messaging and email. The study's findings supported their research - especially with collaboration. Each of the interview participants spoke easily and comfortably on how they collaborate with their ad-hoc class teams to solve a problem using technology.

Distraction. Distraction appears to be a culturally accepted and common event in the millennial generation as evidenced from the findings. Literature on the topic of distraction is quite diverse; from the use of encephalography (EEG) to measure brain wave patterns during a task/distraction episode (e.g., Gaspar & McDonald, 2014; Jacob & Nieder, 2014; McCoy, 2013; and McGinnis, 2012) to measuring Dehydroepiandrosterone (DHEA) levels in saliva during

73

distracting moments of study (e.g., do Vale, 2014). Outside of the laboratory, other studies were

conducted measuring automobile driving distraction through the use of surveys as well as

cameras focused on eye movement during distraction impulses (e.g., Carter, Bingham,

Zakrajsek, Shope, & Sayer, 2014; Faulk, et al., 2014; Foss & Goodwin, 2014; Pradhan, et al.,

2014; Simons-Morton, Guo, Klauer, Ehsani, & Pradhan, 2014). Finally, non-technical literature

provided analyses of techniques for stress reduction and avoidance (e.g., de Botton, 2010; Dixit,

2013; Salzberg, 2010; & Wallace, 1999).

   Distraction: Cognitive effects. Current research on distraction via EEG brain scans

summarizes down to the fact that the brain attends to irrelevant items when not focused intently

on an object or concept (Gaspar & McDonald, 2014). The distraction seems to occur in the

prefrontal cortex and is caused by crossing signals of new input and retrieval within the working

memory during study (Gaspar & McDonald, 2014; Jacob & Nieder, 2014). McCoy's (2013)

research discovered habits that induce distraction in university students. Their study participants

(89.8%) admitted to checking email and social media in class and 80.4% acknowledge that they

miss instruction because of this distraction (pp. 9-10). Gaspar and McDonald (2014) conducted

research on visual and auditory distractive signals when their study's participants were under a

stressful and bored state of mind. It appears that the bored or "low-perceptual cognitive load" (p.

5664) allowed for more cross-signal [i.e., input v. recall] interference, thus distraction. Under a

high-perceptual load [stress] there was little distraction noted. This agreed and disagreed with

this study's findings. It agreed that when it is *crunch time*, the participants noted that they either

ignore their technology or simply shut it off. However their results disagreed with this study's

findings on the aspect of how much technology is used in class. The participants all agreed that

they rarely look at technology, but do notice many other students online often. Participant

reactivity may be at play but was unresolved during the interviews. To summarize cognitive

effects, at times, inputs from technology may lead to distraction. The millennial community

college student does not disclose technology interferes with learning, yet current laboratory

research disagrees.

Distraction: Biochemical effects. Another method of discovering how the brain

processes distraction was through the study of how much DHEA was present in the study's

participant's saliva. Research from do Vale, et al., (2014) discovered how the prefrontal cortex

is awash in Cortisol, a stress response brain chemical which assists the body to focus and ignore

irrelevant data during a fight-or-flight situation. However, Cortisol is balanced by DHEA which

reduces stress and allows for memory to recommence. Their research pointed to situations when

the participant is under stress and trying to study. They provided "novel sounds" (p. 11) to

measure the response. It appears that sounds, more than visual cues, induce distraction when the

participant was not fully engaged with the material; which agreed with Gaspar and McDonald

(2014) that the tendency for distraction is higher when the participant is cognitively neutral or

bored. Again, this agreed with this study's findings that during *crunch time*, the students focus

on their studies.

Distraction: Driving risk. A team of researchers recently studied the effect of distraction

on drivers under the age of 27 using surveys and a series of web cams located throughout the car.

They found that inexperienced drivers had much more hazardous events due to underdeveloped

scanning patterns than from visual and auditory distractions, however this dramatically changed

when the social context of driving changed by the addition of friends in the car (Faulk, et al.,

2014; Foss & Goodwin, 2014). The results of the research from Pradhan, et al., (2014) along

with Foss and Goodwin (2014), agreed with this concept and adds that the "cognitive load"

(Pradhan, et al., 2014, p. S43) is a key factor to distraction; not from "kinematic data alone" (Foss & Goodwin, 2014, p. S58). It appears that the social context of the driving episode changes the receptivity of distraction. Under hazardous conditions such as fog and rain, the tendency for distraction fell sharply whereas under safe driving conditions with few hazards or traffic, the tendency for distractions by the driver's friends became much higher (Foss & Goodwin, 2014). The concept of social context v. distraction was not evinced as a finding or a focus for the research question, but one participant did make a comment that she tends to become more distracted when among her friends and will often find a quiet area of the commons if she needs to intensely study. This topic is recommended for future research to discover how socializing in college affects distraction when the participants need to study.

 Distraction: Reduction and avoidance. Studies conducted in a university laboratory or on a campus parking lot with many instruments displayed may incur the Hawthorne Effect (Landsberger, 1961) where the participants may react unnaturally because they know they are being tested. However, cognitive, biochemical, and social situations are consistently reported to induce a type of stress that can allow distraction to foster. Community college students also incur stress in these three spheres of experience as evinced from the interviews; therefore a review on non-technical literature may offer a vista into what the millennial community college student employs to guard against the inevitable distracting event.

 Since the late 1990's, technology has inadvertently conducted an "unparalleled assault on our capacity to fix our minds steadily on anything. The obsession with current events is relentless" (de Botton, 2010, February 20). This assault arrives in the form of social media, texting, email, online research, online advertisements, and newsfeeds which begs the attention of anyone who wishes to use online tools (Salzberg, 2010). When considering the onslaught of

media to the minds of technology users, Dixit, (2013), Salzberg (2010), and Wallace (1999), offer suggestions to re-focus the mind and diminish distraction. With purposeful attention to focusing the mind to the present state and the consistent practice of ignoring technological siren calls, a student can, over time, learn to ignore these distractions and focus on their study. This supported this study's finding that the participants are aware of these distractions and have developed, over time, the self-discipline to shut off technology when their grade depends on their uptake of the material.

The research of Hu and Driscoll (2013), Roehling, Kooi, Dykema, Quisenberry, and Vandlen (2011), along with Wang (2014), supported this finding as the researchers discussed how the millennials self-regulation of distractions seems to be a hallmark of this generation. They can be performing classwork with the internet providing them newsfeed updates or in a group setting with everyone's cellphone buzzing while they are chatting. It is commonplace for these distractions, and the interview participants do not feel it distracts them from their studies or social collegiality because they have the self-discipline to shut off these distractions when necessary (Wang, Rush, Wilkerson, van der Merwe, 2014). In closing this discussion of distraction, it is acknowledged that participant reactivity to the interviews (i.e., Hawthorne Effect) may have influenced the participant's responses so that they appear to be above distraction. However, all participants agreed and without prompting, offered their strategies to combat distraction. Further studies in this area would fill in the gap of knowledge for the millennial community college student genre.

The last finding on the topic of cultural influence was how they collectively view what has been conventionally called a *computer*. All of the interview participants inadvertently discussed several necessities to make their college experience successful. Many of their classes

have a mandatory online component so they have a need for access to a computer. The term *computer*, as cited by three of the participants, is considered to be both the physical computing device (cell phone, tablet, laptop, desktop computer, etc…) along with an internet connection. They are concomitant; both necessary for access to online work. All cited how important Wi-Fi was to their academic success. Without it, they simply are not performing classwork.

Another reason for the necessity of technology stated by the participants is the problem of role-conflict. Several researchers have examined this and the following topical discussion of additional findings will bring their research to light.

Academic Necessity

This study's findings indicate a relationship between the requirements of classwork and their need for technology to fulfill those requirements. As community colleges continue the evolution of converting traditional in-class courses into "lower-cost labor" (Smith, 2010, p. 46) hybrid or fully online courses, there will be a likewise increase in demand from the millennial community college student for access, efficiency and flexibility from the technology they are accustomed to using on a daily basis (Leist & Travis, 2010). Several researchers, Ellis (2013), Hornak, Akweks, and Jeffs (2010), Lipka (2013), Lundberg (2012), Mars and Ginter (2007), Moskal, Dziuban, Upchurch, Hartman, and Truman (2006), along with Smith (2010) provided research which supported the study's findings and proposed that evolutionary changes in our world economy, personal communications, and search capabilities, caused academia to respond by increasing the availability of online courses and administrative communications such as online catalogs and campus-wide text messaging. It is becoming common for colleges to offer an online degree where the student never attends a physical campus.

The study's findings agreed that online education is quickly becoming an integral function of the twenty-first century collegiate landscape and the millennial community college students are taking advantage of this capability because of the role-conflict that prevents full-time university attendance. Over half of the seven million community college students work full time and "can be considered workers who attend college, not students who work" (Pusser & Levin, 2009, p. 14). More than forty percent live in poverty with thirty-one percent receiving Pell Grants. Many community college students are one paycheck away from economic distress and find their studies as a hope for a better future (Mullin, 2012; Pusser & Levin, 2009). Millennials comprise over half (68% - 73%) of the community college population and in addition to socio-economic concerns, role-conflict often prevents them from attending full-time at a four-year college or university. They often "add the role of learner to other full-time roles and responsibilities" (Merriam et al. 2007, p. 428) and must coordinate school, life and work, and shifting careers because they seldom have just one issue which requires their full attention (Bateson, 1994; Chen, 2009; Glastra et al., 2004 ; Merriam et al., 2007).

Part of the changing academic landscape includes the increasing institutional push for online content. Faculty in community college, privately funded, and university are now creating lesson plans which differ from their traditional in-class pedagogy. They are developing peer-sharing content and grading methods for larger classes where deliverables are submitted at any given time (Lowery, 2004; Twigg, 1996). Findings from this study supported the research of Dew (2012) and Smith (2010) who pointed out how important the internet is to higher education. With the rapidly growing online academic delivery environment, the millennial community college student must have quality access to the internet. This was supported by all participants;

they all spoke of how difficult performing classwork can be when they lose Wi-Fi signal. Some remarked that they simply end their session and access it another time.

Theory Generation

The salient outcome of this study was the validation of prior investigations and how relevant they are to this study's findings regarding the millennial community college student and their culture of technology which foments the necessity for technology in academia. The examination of current research in this discussion supported the core theory without modification and therefore I am confident that this is now the *substantive theory* which answers the research question of: *What theory explains why the millennial community college student needs technology for learning?* To which the answer is: *When the millennial community college student performs the requirements of research, interactive online classwork, and group collaboration, they need access, efficiency, and flexibility in the variety of technological tools they use to meet these requirements.*

The millennial community college student will use any type of computer they are comfortable with and access to reliable campus-wide Wi-Fi is a key to successfully learning educational content. While additional facts were derived from the literature and interview research, many did not apply to the research question. These interesting facts are discussed below as topics for the future researcher who desires to examine the millennial student genre in any educational setting.

<div align="center">

Recommendations for Future Research

</div>

Ideas generated from the review of literature and from the interviews offer future researchers five areas of study to consider. Discovering answers to these topics will partially fill in the gap of knowledge in the millennial student genre.

Post-Millennial generation. The last of the millennial generation was born in 2002. Consequently, the oldest of the post-millennial generation is currently twelve years old but a generational moniker has not been established. The research of Howe and Strauss (2000) provides a thorough discussion of the qualities of generational titles.

Experiential learning. McCoog (2008) discovered that millennials prefer experiential learning over rote memorization. Can this be quantified?

Classroom versus Online. The discoveries from this study's interviews indicate that millennials prefer a combination of both on-line and in-class activities. What would be the optimal mix of in-class activities and online activities for the millennial generation? Does content delivery need to change? ; i.e., Is face-to-face training as effective as online training? Is online effective as a stand-alone vehicle, or does it better provide review skills and catch-up of missed material?

Patience with technology. Research from McGinnis (2012) uncovered dramatic differences in distraction with young v. older computer users. Is there a delineation of age or experience with having patience for technological delays? There was an interesting demarcation of age (approximately 25 years old) noticed in the interviews; the older students seemed annoyed at any technological delay while the younger students were unfazed with delays.

Distraction of studies. Considering that there is recent, yet incomplete, data on how cognitive, biochemical, and social situations induce the type of stress which allows distraction to be noticed, further research is required to fill in the gap of knowledge as related to the millennial community college student. The topic of distraction in academic studies has received limited attention in scholastic literature (e.g., Bass, 2013; Bonner II, 2010; Charsky et al., 2009; Emanuel, 2013; Haugen and Musser, 2013; Twenge, 2006). The interviewed students

81

acknowledge that their personal technology can be distracting, but seem to have safeguards against this. They simply shut off their technology during *crunch time*. However, this was a small sample of community college millennial students. Distraction can arrive in many forms such as a beep on a cell phone or the voluminous data available to these young researchers. To fill in the gap of knowledge, the following research questions are recommended to discover the depth of distractions and its impact on adult learning:

- How does technology assist or hinder a college student in making sense of the data or find meaning of the material in application to their lives?

- Is academia creating programs and methods to assist students in avoiding distraction or helping to maintain focus on the task?

- All of the interview participants reported how they do homework by clicking on a choice displayed on-screen. Is this reception or production? Does online clicking fit into Bloom's Taxonomy (1956)? Is this affected by the prevalence of distraction?

- From the interviews, the topic of distraction was discovered and discussed in the analysis. Are the key terms of *social aspect* and *pop-ups*, etc. similar in other research? Are the millennials sending a signal to academia?

- One of the interview participants used the term *addicted to technology*. From a sociological and/or psychological standpoint, is this true?

- How does socializing in college affect the distraction self-defense mechanisms when the participants need to study?

Conclusion

One of the principal goals of this grounded theory study was to discover the experience in terms of processes and technological tools the millennial community college student naturally

82

uses to learn academic content. Three contributions arose from this study which partially fills in the gap of knowledge of the millennial community college student genre. The first contribution from this study is the mapping out of the grounded theory process.
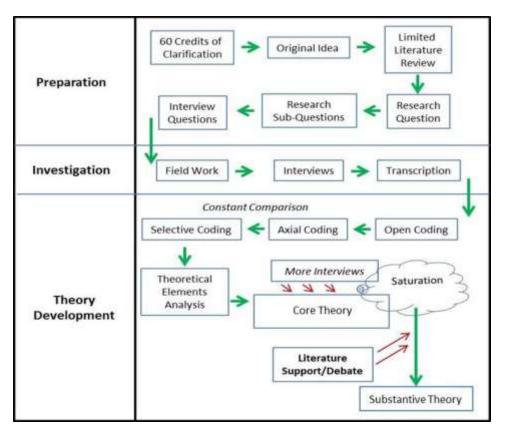

Figure 10. Conceptual Framework of this Grounded Theory study.

The leaders in the grounded theory field would be Glaser and Strauss (1967), Strauss and Corbin (1998), Creswell (1998 & 2009), and Moustakas (1994). Each of them developed understanding in unique segments of the grounded theory process. This study culled these seminal ideas into an overall process for a better understanding by novice researchers.

A second contribution of this study was the generation of a substantive theory which explains why the millennial community college student uses technology for learning. The scope of this study remained narrow; comparing their views, reactions, and thoughts through one-on-one interviews and the technique of qualitative coding. This narrow focus allowed data

saturation to emerge and provided the tenants of a theory which explains where the students exist regarding technologically enhanced academic study methods.

The foremost contribution of this study is that it gave voice to the millennial community college student view describing why they use technology for college studies. The summation of this study's findings point to the millennials need for access, efficiency, and flexibility from academia in the form of a quality internet connection and recommends that academia would achieve greater utility from increasing bandwidth and nodes of their Wi-Fi access so that students will have a more reliable and stronger signal to accomplish their required online academic tasks anywhere on campus.

In closing, John Dewey's advice to academia, penned 70 years ago, rings true for today's community college administration and faculty and is worthy of reprise: "If we teach today's students as we taught yesterday's, we rob them of tomorrow" (1944, p. 167). The culture of our current college student is substantially different from the previous generations because of their adoption of technology. Academia would achieve greater utility by addressing this generation's unique needs, offer distraction-free environments, and make considerations of content delivery for the post-millennial student who will enter college very soon.

REFERENCES

Alsop, R. (2008). *The trophy kids grow up: How the millennial generation is shaking up the workplace*. San Francisco, CA: Jossey-Bass.

Axtell-Paulsen, M. (1998, April 21). Reflections. *Pikes Peak Community Newsletter*, p. 2.

Bajt, S. K. (2011). Web 2.0 technologies: Applications for community colleges. *New Directions for Community Colleges*, (154), 53-62. doi:10.1002/cc.446

Bass, D. (2013). The millennial generation lacks a strong work ethic. In D. Haugen & S. Musser (Eds.), *The millennial generation: Opposing viewpoints* (pp. 50-55). Farmington Hills, MI: Cengage.

Bateson, M. C. (1994). *Peripheral visions: Learning along the way*. (1st ed.). New York, NY: HarperCollins.

Bauerlein, M. (2013). The millennial generation is not a group of motivated overachievers. In D. Haugen & S. Musser (Eds.), *The millennial generation: Opposing viewpoints* (pp. 14-17). Farmington Hills, MI: Cengage.

Becker, C. H. (2009). Student values and research: Are millennials really changing the future of reference and research? *Journal of Library Administration*, *49*(4), 341-364. doi:10.1080/01930820902832454

Behrend, T. S., Wiebe, E. N., London, J. E., & Johnson, E. C. (2011). Cloud computing adoption and usage in community colleges. *Behaviour & Information Technology*, *30*(2), 231-240. doi: 10.1080/0144929X.2010.489118

Berk, R. A. (2010). How do you leverage the latest technologies, including Web 2.0 tools, in your classroom? *International Journal of Technology in Teaching and Learning*, *6*(1), 1-13.

Bloom B.S. (1956). *Taxonomy of educational objectives, handbook I: The cognitive domain*. New York: David McKay Co Inc.

Boeije, H. (2002). A purposeful approach to the constant comparative method in the analysis of qualitative interviews. *Quality & Quantity*, *36*, 391-409.

Bonner II, F. (2010). *Academically gifted African American male college students*. Santa Barbara, CA: ABC-CLIO.

Borgatti, S. (2011). *Introduction to grounded theory*. Retrieved from http://www.analytictech.com/mb870/introtogt.htm

Brott, P. & Myers, J. (2002). Development of professional school counselor identity: A grounded theory. In S. Merriam (Ed.), *Qualitative research in practice: Examples for discussion and analysis*. (pp. 145-159). San Francisco, CA: Jossey-Bass.

Bryant, A. (2002). Grounding systems research: Re-establishing grounded theory. *Proceedings of the 35th Hawaii International Conference on System Sciences* - 2002 HICSS-35, Waikoloa, HI. doi=10.1.1.112.5260

Carter, P., Bingham, C., Zakrajsek, J., Shope, J., & Sayer, T. (2014). Social norms and risk perception: Predictors of distracted driving behavior among novice adolescent drivers. *Journal of Adolescent Health, 54*(5S), S32-S41.

Charmaz, K. (2000). Grounded theory: Objectivist and constructivist methods. In N.K. Denzin & Y.S. Lincoln (eds.), *Handbook of Qualitative Research*. (2nd ed.). (pp. 509-535). Thousand Oaks, CA: Sage

Charsky, D., Kish, M. L., Briskin, J., Hathaway, S., Walsh, K., & Barajas, N. (2009). Millennials need training too: Using communication technology to facilitate teamwork. *Techtrends: Linking Research & Practice to Improve Learning*, *53*(6), 42-48. doi:10.1007/s11528-009-0342-2

Chen, G. (2009, Jan 26). Changing student demographics: Rising number of professional students. *Community College Week*. Retrieved from http://www.communitycollegereview.com/articles/75

Christiansen, H. & Partners, P.C., (Jan 12,1996). *Pikes Peak Community College north site: Schematic design submittal*. Denver, CO: Davis Partnership, P.C., Architects.

Chung, H., & Jackson-Behan, K. (2010). Peer sharing facilitates the effect of inquiry-based projects on science learning. *The American College Teacher*, *72*(1), 24-29. doi: 10.1525/abt.2010.72.1.7

Clarke, A. (2005). *Situational analysis: Grounded theory after the postmodern turn*. Thousand Oaks, CA: Sage.

Creswell, J. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.

Creswell, J. W. (2009). *Research design, qualitative, quantitative, and mixed methods approaches*. (3rd ed.). London, England: Sage.

Coffey, A., & Aktinson, P. (1996). *Making sense of qualitative data: Complementary research strategies*. Thousand Oaks, CA: Sage.

Coomes, M. D., & DeBard, R. (2004). A generational approach to understanding students. *New Directions for Student Services*, (106), 5-16.

Coyne, I., & Cowley, S. (2006). Using grounded theory to research parent participation. *Journal of Research in Nursing*, *11*(6), 501-515.

Cutcliffe, J. (2000). Methodological issues in grounded theory. *Journal of Advanced Nursing, 31*(6), 1474-1484.

Dahlstrom, E. (2012). *ECAR study of undergraduate students and information technology*. Louisville, CO: EDUCAUSE Center for Applied Research, September, 2012. http://www.educause.edu/ecar

Daniels, H. (2012). *Vygotsky and sociology*. Oxon, England: Routledge.

Davis, D. (2003). Millennial teaching. *Academe*, *89*(1), 19-22.

Dew, J. R. (2012). The future of American higher education. *World Future Review* (World Future Society), 4(4), 7-13.

Dewey, J. (1929). *The quest for certainty: A study of the relation of knowledge and action*. New York, Minton, Balch & Co. https://archive.org/details/questforcertaint032529mbp

Dewey, J. (1944). *Democracy and education*. New York, NY: Macmillan.

Dewey, J. (1968). *Philosophy and civilization*. Gloucester, MA: Putnam.

do Vale, S., Selinger, L., Martins, J., Gomes, A., Bicho, M., do Carmo, I., & Escera, C. (2014). The relationship between Dehydroepiandrosterone (DHEA), working memory and distraction – A behavioral and electrophysiological approach. *Plos ONE, 9*(8), 1-14. doi:10.1371/journal.pone.0104869

de Botton, A. (2010, February 20). On distraction. *Soundings*. http://www.city-journal.org/2010/20_2_snd-concentration.html

Dixit, J. (2013, September 20). The art of now: Six steps to living in the moment. *Psychology Today*. Retrieved from http://www.psychologytoday.com/articles/200810/the-art-now-six-steps-living-in-the-moment

Driscoll, M. P., (1994). *Psychology of learning for instruction*. Needham Heights, MA: Allyn & Bacon.

Dunne, C. (2011). The place of the literature review in grounded theory research. *International Journal of Social Research Methodology, 14*(2), 111-124. doi: 10.1080/13645579.2010.494930

Eliot, S. (2011, Aug 18). [Web log message]. Retrieved from http://www.qualitative-researcher.com/focus-group/making-your-qualitative-data-trustworthy/

Ellis, M. (2013, April 15). Weaving adjunct faculty into the twenty-first century community college. *Community College Week*, (7), 4-5.

Elwes, R. (1936). *Philosophy of Benedict de Spinoza*. (R. Elwes, Trans.) New York, NY: Tudor

Emanuel, J. (2013). Digital native librarians, technology skills, and their relationship with technology. *Information Technology & Libraries*, *32*(3), 20-33.

Ennis, L., & Gambrell, E. (2010). A comparison of undergraduate faculty and millennial students regarding the utilization of weblog and podcast technology in a teacher education department. *Turkish Online Journal of Distance Education, 11*(1), 114-122. Retrieved from http://www.eric.ed.gov/PDFS/EJ886455.pdf

Faulk, E., Cascio, C., O'Donnell, M., Carp, J., Tinney Jr., F., Bingham, C., Simons-Morton, B. (2014). Neural responses to exclusion predict susceptibility to social influence. *Journal of Adolescent Health, 54*(5S), S22-S31.

Fenwick, T. J. (2003). *Learning through experience: Troubling orthodoxies and intersecting questions.* Malabar, FL: Krieger.

Foss, R., & Goodwin, A. (2014). Distracted driver behaviors and distracting conditions among adolescent drivers: Findings from a naturalistic driving study. *Journal of Adolescent Health, 54*(5S), S50-S60.

Gaspar, J., & McDonald, J. (2014). Suppression of salient objects prevents distraction in visual search. *The Journal of Neuroscience, 34*(16), 5658 –5666.

Glaser, B. (2002). Conceptualization: On theory and theorizing using grounded theory. *International Journal of Qualitative Methods*, *1*(2), 1-31.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research.* Hawthorne, NY: Aldine De Gruyter.

Glastra, F., Hake, B., & Schedler, P. (2004). Lifelong learning as transitional learning. *Adult Education Quarterly, 54*(4), 291-307. doi: 10.1177/0741713604266143

Glesne, C. (2006). *Becoming qualitative researchers: An introduction.* Boston, MA: Allyn & Bacon.

Gliner, J. A., Morgan, G. A. ,& Leech, N. L. (2009). *Research methods in applied settings: An integrated approach to design and analysis*. New York, NY: Taylor & Francis.

Goodstein, A. (2007). *Totally wired: What teens and tweens are really doing online*. New York, NY: St. Martin's Press.

Greenberg, E., & Weber, K. (2008). *Generation We*. Emeryville, CA: Pachatusan.

Haugen, D., & Musser, S. (2013). Introduction. In D. Haugen & S. Musser (Eds.), *The millennial generation: Opposing viewpoints* (pp. 14-17). Farmington Hills, MI: Cengage.

Hooker, D. (2011). Small peer-led collaborative learning groups in developmental math classes at a tribal community college. *Multicultural Perspectives*, *13*(4), 220-226. doi: 10.1080/15210960.2011.616841

Hornak, A., Akweks, K., & Jeffs, M. (2010). Online student services at the community college. *New Directions for Community Colleges*, (150), 79-87. doi: 10.1002/cc.407

Howe, W. (2012, Oct 13). *A brief history of the internet*. Retrieved from http://walthowe.com/navnet/history.html

Howe, N. & Strauss, W., (2000). *Millennials rising – the next great generation*. New York, NY: Vintage Books.

Hu, H., & Driscoll, M. P. (2013). Self-regulation in e-learning environments: A remedy for community college?. *Educational Technology & Society*, *16*(4), 171-184.

Hume, D. (1748/2004). An enquiry concerning human understanding [1748], dover ed., 2004. Mineola, N.Y.: Dover

Jackson, L. D. (2012). Is mobile technology in the classroom a helpful tool or a distraction?: A report of university students' attitudes, usage practices, and suggestions for policies. *International Journal of Technology, Knowledge & Society, 8*(5), 129-140.

Jackson, W. (1996, Nov 03). *A survey of an adult learner*. Retrieved from http://cybermesa.com/~bjackson/Papers/A Survey of an Adult Learner.pdf

Jacob, S., & Nieder, A. (2014). Complementary roles for primate frontal and parietal cortex in guarding working memory from distractor stimuli. *Neuron, 83*(1), 2-26.

Jones, C., & Hosein, A. (2010). Profiling university students' use of technology: Where is the net generation divide?. *International Journal of Technology, Knowledge & Society*, *6*(3), 43-58.

King, K. (2010). Informal learning in a virtual era. In C. Kasworm, A. Rose & J. Ross-Gordon (Eds.), *Handbook of adult and continuing education* (pp. 421-429). Thousand Oaks, CA: Sage.

Kuhlthau, C., Maniotes, K., & Caspari, A. (2007). *Guided inquiry: Learning in the twenty-first century*. Westport, CT: Libraries Unlimited.

Kvavik, R. (2013). *Convenience, communications, and control: How students use technology*. Retrieved from http://www.educause.edu/research-and-publications/books/educating-net-generation/convenience-communications-and-control-how-students-use-technology

Laird, S. (2012, May 06). *How tech is changing college life*. Retrieved from http://mashable.com/2012/05/06/tech-college-infographic/

Landsberger, H. (1961). *Hawthorne Revisited*. Ithaca: Cornell University Press.

Layder, D. (1998). *Sociological practice: Linking theory and social research*. London: Sage.

Leist, J., & Travis, J. (2010). Planning for online courses at rural community colleges. *New Directions for Community Colleges*, (150), 17-25. doi: 10.1002/cc.401

Lewis, J. (2009). Redefining qualitative methods: Believability in the fifth moment. *International Journal of Qualitative Methods*, *8*(2), 1-14.

Lipka, S. (2013). 2-year colleges get strategic about enrollment. *Chronicle of Higher Education*, *60*(11), 1-4.

Lippincott, J. K. (2010). Information commons: Meeting millennials' needs. *Journal of Library Administration*, *50*(6), 27-37. doi:10.1080/01930820903422156

Lowery, J. (2004). Student affairs for a new generation. *New Directions for Student Services*, (106), 87-99.

Lundberg, T. C. (2012). Learning to innovate in twenty-first- century community colleges: Searching for the general education niche in two-year colleges. *New Directions for Community Colleges*, (157), doi: 10.1002/cc.20008

McAlister, A., & Crappell, C. (2014). Twenty-first century pedagogy: A whole new world again. *Clavier Companion*, *6*(1), 56-63.

Mars, M. M., & Ginter, M. (2007). Connecting organizational environments with the instructional technology practices of community college faculty. *Community College Review*, *34*(4), 324-343.

Martin, J. (2009, Mar 17). *A short history of the smartphone*. Retrieved from http://www.articlesbase.com/cell-phones-articles/a-short-history-of-the-smartphone-820376.html

Maxwell, J. A. (19962). *Qualitative research design: An interactive approach.* Thousand Oaks, CA: Sage.

Maykut, P., & Morehouse, R. (1994). *Beginning qualitative researchers: A philosophical and practical guide*. Washington, DC: Falmer.

McCallin, A. (2003). Grappling with the literature in a grounded theory study. *Contemporary Nurse, 15*(1-2), 61-69.

McCoog, I. J. (2008). T*wenty-First century teaching and learning*. Retrieved from http://eric.ed.gov:80/ERICWebPortal/

McCoy, B. (2013). Digital distractions in the classroom. *Journal of Media Education, 4*(4), 5-14.

McGhee, G., Marland, G., & Atkinson, J. (2007). Grounded theory research: Literature reviewing and reflexivity. *Journal of Advanced Nursing, 60*(3), 334-342.

McGinnis, D. (2012). Susceptibility to distraction during reading in young, young-old, and old-old adults. *Experimental Aging Research, 38*(4), 370-393. doi:10.1080/0361073X.2012.699365

McGlynn, A. (2005). Teaching millennials: Our newest cultural cohort. *Education Digest, 71*(4), 12-16.

Merriam, S. (2002). Grounded theory. In S. Merriam (Ed.), *Qualitative research in practice: Examples for discussion and analysis*. San Francisco, CA: Jossey-Bass.

Merriam, S., & Brockett, R. (2007). *The profession and practice of adult education: An introduction*. San Francisco, CA: Jossey-Bass.

Merriam, S., Caffarella, R., & Baumgartner, L. (2007). *Learning in adulthood: A comprehensive guide*. San Francisco, CA: Jossey-Bass.

Moskal, P., Dziuban, C., Upchurch, R., Hartman, J., & Truman, B. (2006). *Assessing online learning: What one university learned about student success, persistence, and satisfaction. Peer Review*, *8*(4), 26-29.

Moustakas, C. E. (1994). *Phenomenological research methods*. Thousand Oaks, CA: Sage.

Mullin, C. (2012). *Why access matters: The community college student body*. Washington, DC: American Association of Community Colleges.

Natali, D. J. (2009). Qualitative research report on the millennial student and their use of technology in a community college setting. Unpublished manuscript, *School of Education*, Colorado State University, Fort Collins, CO.

Nikirk, M. (2009). Today's millennial generation: A look ahead to the future they create. *Techniques: Connecting Education & Careers, 84*(5), 20-23.

Oblinger, D. G., and Oblinger, J. L. (2005). *Educating the net generation*, Boulder, CO: Educause. http://www.educause.edu/educatingthenetgen

O'Donnell, C. (2011, Oct 12). College students limit technology use during crunch time. *University of Washington*: News releases. Retrieved from http://www.washington.edu/news/2011/10/12/college-students-limit-technology-use-during-crunch-time/

O'Neill, R. (1961). *Readings in epistemology*. (3rd Printing-1965). Englewood Cliffs, NJ: Prentice-Hall.

Pikes Peak Community College. (1998, April 21). Rampart Range campus opens middle of July. *Pikes Peak Community Newsletter*, pp. 1,7.

Pradhan, A., Li, K., Bingham, C., Simons-Morton, B., Ouimet, M., & Shope, J. (2014). Peer passenger influences on male adolescent drivers' visual scanning behavior during simulated driving. *Journal of Adolescent Health, 54*(5S), S42-49.

Pusser, B., & Levin, J. (2009). *Re-imagining community colleges in the Twenty-First Century*. Retrieved from Center for American Progress website: http://www.americanprogress.org/wp-content/uploads/issues/2009/12/pdf/community_colleges_reimagined.pdf

Roehling, P., Kooi, T., Dykema, S., Quisenberry, B., & Vandlen, C. (2011). Engaging the millennial generation in class discussions. *College Teaching*, *59*, 1-6. doi: 10.1080/87567555.2010.484035

Salzberg, S. (2010). *Real happiness: The power of meditation*. New York, NY: Workman.

Sandars, J., & Morrison, C. (2007). What is the Net Generation? The challenge for future medical education. *Medical Teacher*, *29*(2/3), 85-88. doi:10.1080/01421590601176380

Scott, H. (2009). *What is grounded theory?* Retrieved from http://www.groundedtheoryonline.com/what-is-grounded-theory

Sheldon, L. (2012). *The multiplayer classroom: Designing coursework as a game*. Boston, MA: Cengage Learning.

Simons-Morton, B., Guo, F., Klauer, S., Ehsani, J., & Pradhan, A. (2014). Keep your eyes on the road: Young driver crash risk increases according to duration of distraction. *Journal of Adolescent Health, 54*(5S), S61-S67.

Smith, V. (2010). Essential tasks and skills for online community college faculty. *New Directions for Community Colleges*, (150), 43-55. doi: 10.1002/cc.404

Squire, K., & Steinkuehler, C. (2005). Meet the gamers. *Library Journal, 130*(7), 38-41.

Stone, L. (2011, February 7). Re: Continuous partial attention [web log message]. Retrieved from http://lindastone.net/qa/continuous-partial-attention

Strauss, A. L. ,& Corbin, J. M. (1998). *Basics of qualitative research, techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage.

Sweeney, R. (2007). How the new generation of well-wired multitaskers is changing campus culture. *The Chronicle of Higher Education, 53*(18), B10.

Twenge, J. M. (2006). *Generation Me, why today's young Americans are more confident, assertive, entitled-and more miserable - than ever before*. New York, NY: Free Press.

Twigg, C. A. (1996). Is technology a silver bullet? *Educom Review*, *31*(2), 28.

Vincent, E. (2012). Generation Gaps in the Workplace: Making Friends With Technology and Millennials. *AMWA Journal: American Medical Writers Association Journal*, *27*(3), 144.

Wagner, T. (2008). *The global achievement gap: Why even our best schools don't teach the new survival skills our children need -- and what we can do about it*. New York, NY: Basic Books.

Wallace, B. (1999). The Buddhist tradition of Samatha: Methods for refining and examining consciousness. *Journal of Consciousness Studies, 6*(2-3), 175-188.

Wang, H., Rush, B., Wilkerson, M., & van der Merwe, D. (2014). Exploring the use of tablet PCs in veterinary medical education: Opportunity or obstacle? *Journal of Veterinary Medical Education, 41*(2), 122-133.

Wilson, M. E. (2004). Teaching, learning, and millennial students. *New Directions for Student Services*, (106), 59-71

Wolcott, H. (1994). *Transforming qualitative data: Description, analysis, and interpretation*. Thousand Oaks, CA: Sage.