

STUDENTS WITH DISABILITIES EXPERIENCE IN HIGHER EDUCATION
ONLINE COURSES: AN EXPLORATORY STUDY OF SELF-EFFICACY, USE OF
ASSISTIVE TECHNOLOGIES AND MOBILE MEDIA

by

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DEDICATION

I would like to dedicate this to my parents, Risheenand and Haimoutie Parasram, who have instilled in me the motivation and yearning to reach for my dreams, who have taught their children about the true power of an education, who have shown me through their own persistence and courage that you can accomplish the things you set your mind to through effort and hard work and that change begins with me. It is through the combination of your efforts and guidance, that I am who I am, and will always strive to live a meaningful and purposeful life. My own self-efficacy can be attributed to your belief in my capabilities to achieve and for always being the unconditionally loving parents you are. And for all of that, and so much more, I thank you.

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ABSTRACT

The overarching aim of this mixed methods study was to explore the online experiences of students with disabilities, with particular focus on students' use of assistive technologies, mobile media and self-efficacy. Using a multifaceted and integrative approach, this study considered a framework of universal design, Scherer's Matching Person and Technology model and theories such as social cognitive theory to help strengthen the study by using theory triangulation (Denzin, 1978; Patton, 2002).

The study site was a large Community College in Southern California. Students who met the criteria for the study, voluntarily chose to participate in either the quantitative survey portion of the study (n=42) or the qualitative semi-structured interview (n=9) or both (n=9). The findings suggest that students' awareness of accommodations, their use of assistive technologies, use of mobile media, instructor feedback, instructor engagement with students and organization of the instructor were key factors in their learning and experience in an online academic environment. The results from the quantitative analysis indicated that students' perceptions of support offered in face to face versus online courses made no statistical difference; participants reported having high self-efficacy in their own beliefs and expectations to successfully complete the course; and they were most often able to meet their own grade and learning expectations in the online course.

The implications of this study indicate the need for instructor engagement and feedback, the need for professional development to online instructors, and educational institutions, and perhaps an online tutorial and discussion forum for students to engage with instructors in online courses. The study also supports the notion that when

curriculum is not designed through the lens of Universal design, where access to accommodations and resources are embedded in the course itself, it can lead to students with disabilities feeling unsupported by their educational institutions and overwhelmed in their academic course work, decreasing motivation and performance.

CHAPTER 1: THE PROBLEM

This study explored the experiences of college students with disabilities in taking online courses, with particular attention on the use of assistive technology and mobile media devices. It also explored how students' self-efficacy affects their overall engagement in the course. This chapter provides a background of students with disabilities and their experiences in online or distance education. It also provides an overview of the problems in higher education in regards to experiences with access and efficacy of taking courses online. Additionally, this chapter discusses the purpose of the study, includes the research questions, and defines key terms used.

Statement of the Problem

The number of students with disabilities (SWDs) who have enrolled in higher education institutions has grown greatly (Beilke & Yssel, 1999; Shevlin, Kenny, & McNeela, 2004; Barnard-Brak, Lechtenberger & Lan, 2010) and, since 1978, the number of students who self-identified regarding a disability quadrupled (Michaels, Prezant & Jackson, 2002). With the passage of the Americans with Disabilities Act (ADA) of 1990, antidiscrimination laws were extended under Section 504 to include postsecondary institutions (Kosine, 2007) and provided equal opportunities to people with disabilities, including the choice to pursue studies in higher education (Myers & Bastian, 2010). In postsecondary education, students with disabilities have to request accommodations in order to receive services (Barnard-Brak & Sulak, 2010) and are required to self-identify to their educational institution, which is quite different from their experiences in K-12 settings.

In 1973, Congress passed the Public Law 930112 Rehabilitation Act, which helped to establish the foundation for equal access for all Americans, and advanced the civil rights movement mandating all individuals, whether disabled or not, to have equal access to employment. This Act included Title V, Section 502, which mandated accessibility of telecommunications and buildings, and Section 504 which stated that no qualified disabled person will be left out from participation in, be deprived of benefits, or experience discrimination by any program that is receiving Federal Financial assistance (U.S. Department of Labor, 2006; Roberts & Crittenden, 2009). The Rehabilitation Act of 1973, Section 508 mandated that electronic information is accessible to all (Roberts & Crittenden, 2009). Although the 1990 ADA did not specifically address WebPages or online environments, Section 508 of the Rehabilitation Act was amended in 1998, setting minimum guidelines for accessibility standards in electronic technology, information and technology, and also in accessible distance education (Roberts & Crittenden, 2009). These laws were developed to ensure that electronic information is made accessible for individuals with and without disabilities, but, until recently, accessibility in distance educational programs was not being formally addressed (Roberts & Crittenden, 2009).

The implications for students with disabilities in online education courses along with integrating technology into the learning environment, specifically assistive technologies such as mobile media devices, when utilizing accommodations can be daunting. According to the United States Distance Learning Association (2002) distance learning is defined as “the acquisition of knowledge and skills through mediated information and instruction” (Banerjee & Brinckerhoff, 2002, p. 26). The key elements of distance education are a) an academic environment where the instructor and student

are disconnected by physical distance,; b) a facilitated distribution by electronic means of instruction, usually by video, satellite and auditory transmission, computer equipment and/or multimedia; and c) teaching that happens in real time or synchronously, or asynchronously or not at the instant it is delivered (University of Idaho, Engineering Outreach, 2001; Banerjee & Brinckerhoff, 2002, p. 26.).

Online distance learning signifies a switch from higher education being available anywhere and anytime, but not being accessible to everyone, such as students with disabilities (Schmetze, 2001; Barnard-Brak & Sulak, 2010). Students with disabilities may come across a digital divide (Burghstahler, 2003; Barnard-Brak & Sulak, 2010), where, despite their increasing numbers in postsecondary education, they may be outperformed in the online environment by not having the needed accommodations or assistive technologies (Barnard-Brak, 2010). However, online academic environments that are formed with individuals with disabilities in mind can raise access for all (Burghstahler, 2006; Barnard-Brak & Sulak, 2010).

Researchers Roblyer and Edwards (2000) encouraged the expansion of technology use in educational settings because they believed that methods using technology can empower and motivate learners to take control of their learning (Duhaney & Duhaney, 2000). A study conducted by Goodman, Tiene and Luft (2002) found four studies measuring efficacy and student satisfaction with programs that offered Assistive Technologies (AT). These studies found that college students who took distance education courses reported they were able to work at a flexible pace, had the ability to take tests immediately after studying the subject, and reported having the ability to take the course at home as an advantage. However, these students also reported having

telecommunication interruptions, and were not able to access immediate support and assistance when needed in online courses. Goodman, Tiene and Luft (2002) suggested recommendations for improvement to the delivery of services related to technology and students with disabilities. Some of those recommendations are as follows: first, they suggest that all colleges should provide full technological access into programs for their students with disabilities, and, secondly, funding should be available that encourages the creative development and use of technology in order to enhance access to education for students with disabilities in higher education.

Distance education has provided advantages for SWD such as access to higher educational institutions, offering students the flexibility in location, delivery and even scheduling of courses (Moisey, 2004). Ommerborn (1998) conducted a comprehensive review of distance education programs for SWDs and found that, along with providing access to this population of students, it is also important to ensure that SWDs are receiving the support they need in order to be successful (Moisey, 2004). Horn and Berkold (1999) found that SWDs who receive necessary supportive services are able to persevere in their academic studies and graduate at similar proportions to their peers without disabilities.

The use of technologies today has grown considerably from a decade ago. Technology surrounds our everyday environment and has tremendous implications for how we carry out our daily lives and our quality of life. Technology has allowed an individual to have independence and interdependence (Scherer, 1996) and has created a sort of interactive relationship between the user, the technology and the environment that changes over time. According to Scherer (1996), the amount of people using assistive

technology (AT) devices has increased dramatically, with the growth being attributed to the following factors: a growth in the number of individuals with disabilities who have survived severe trauma and diseases; advancements in the availability of microcomputers and the legislation with regards to individuals with disabilities mandating the consideration of AT. As these technologies have become more affordable and portable, the differences in individual users can now be accommodated (Scherer, 1996). However, when considering the needs of individuals as learners, the process of matching a person with technological devices such as AT can be more complicated, because, according to Scherer (1996), a person's reactions to technologies can be very complex. This complexity can be attributed to each individual's needs, abilities, computer efficacy, past experiences with using technology, and overall exposure to different types of technologies. Heiman and Shemesh (2011) find that progress in instructional technology has led to considerable developments in the field of assistive technology, and assistive technologies (ATs) offer alternative formats, especially when related to students' academic needs, thus becoming a necessary tool in institutions of higher education. The use of different ATs can increase the independence of students with a learning disability (Heiman & Shemesh, 2011) and may help to reduce deficits in literacy skills (Crivelli, Thomson, & Anderson, 2004; Heiman & Shemesh, 2011).

Studies involving SWDs and the support services they receive in distance educational settings have had little attention when compared to studies involving SWDs in traditional classroom or postsecondary settings (Moisey, 2004). According to researcher Mosiey (2004) "more knowledge is needed about the participation of students with disabilities in distance education, the services they access, and the success they

experience in their studies” (p. 75). The ease of technology usage can help to promote both SWD’s abilities to overcome barriers with regard to difficulties in learning as well and their interpersonal skills (Lewis, 1998; Heiman & Shemesh, 2011).

Purpose of the Study

The purpose of this study was to explore the experiences of college students with disabilities when taking distance education or online courses as compared to taking a class in a traditional classroom learning environment, how this change in environment influences their self-efficacy, and how the use of mobile media devices has influenced their learning in an online environment. This study generates new knowledge through exploration and qualitative and quantitative design methods. It contributes to the literature on students with disabilities in distance education settings (Lewis, 1998; Ommerborn, 1998; Carnevale, 1999; Horn & Berkold, 1999; Mull, Sitlington, & Alper, 2001; Schmetze, 2001; Goodman, Tiene & Luft, 2002; Burgstahler, 2003; 2006; Burgstahler, Corigan & McCarter, 2004; Edmonds, 2004; Getzel, McManus, & Briel, 2004; Moisey, 2004; Roberts & Crittenden, 2009; Barnard-Brak & Sulak, 2010; Myers & Bastian, 2010; Heiman & Shemesh, 2011). Bandura’s (1986) social cognitive theory proposes that peoples’ behaviors can usually be predictable by their beliefs in their own capabilities (Pajares, 2003). By connecting Bandura’s social cognitive theory as the foundation, along with his framework of triadic reciprocity (1986) which looks at the personal-environmental and interaction factors; Scherer’s (1992) Matching Person with Technology model, which considers environmental as well as social contexts of varying situations in which a technology device can be used; and the principles of universal design this study extends the work on students with disabilities who take online courses.

By using a multifaceted and comprehensive theoretical background it not only extends the literature but aims to help to provide a thorough understanding of the needs of students with disabilities. It also serves to fill the gap in the literature regarding students with disabilities in distance education and their use of assistive technologies, particularly mobile media devices. It explores the experiences of college students in this environment, and how their self-efficacy can influence their learning or success in these courses and also explores their use of mobile media devices to help facilitate learning.

The research questions used in this study were informed through the literature review process and with consideration and attention to the purpose and background of the study. They aim to extend the literature on students with disabilities in distance education or online environments and were useful in helping to evaluate and provide support to the study.

Research Questions

The research questions used in this study address the issues of access, engagement and efficacy and explore the experiences of students with disabilities who take online courses. The research questions in this study help inform future research as well as help provide practical knowledge as to how educators can best help students with disabilities learn and improve their overall performance. This study aimed to focus on the following research questions:

What are the experiences of college students with disabilities taking online or distance education courses?

What are the experiences of college students with disabilities enrolled in online courses in regards to using assistive technologies and mobile media devices?

How does taking online courses affect students self- efficacy in the online environment?

Importance of the Study

This study expands on the sparse literature that already exists on students with disabilities in distance education. It explores the experiences of students with disabilities who take online courses and looks at how their self-efficacy contributes to or influences their learning and success in these courses. Using social cognitive theory, the framework of Universal Design and Scherer's Matching Person with Technology model, this study provides a comprehensive lens for exploring the experience of students with disabilities experiences who take online courses and how they can be best supported in distance education courses. The theoretical background of social cognitive theory along with Bandura's "triadic reciprocal causation" (Bandura, 1986, p.22) helps to conceptualize the foundation for this study in that it takes into account the students' beliefs in their own capabilities or self-efficacy, their internal personal factors (cognitive, affective and biological) their behavior, as well as the environmental factors that may influence their ability to be successful in distance education or online courses (Martin, 2004).

Definition of Terms

Assistive Technology: "Any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities." (Individuals with Disabilities Education Improvement Act, 2004, sec. 602; Heiman & Shemesh, 2011, p. 2).

Distance learning: “the acquisition of knowledge and skills through mediated information and instruction.” (The United States Distance Learning Association, 2002).

Self-efficacy: refers to the belief in one’s own abilities to organize and take action required to produce given attainments (Bandura, 1997, p. 3).

Self-Efficacy theory: also says that what we believe about ourselves can have a strong influence on our task choice, our level of effort, persistence and resilience and how we ultimately perform (Bandura, 1997, p. 3).

Universal Design: “the design of products and environments to be usable by all people to the greatest extent possible without the need for adaptation or specialized design” (Center for Universal Design, 1997, para. 1; McGuire, Scott & Shaw, 2006, p. 167).

Mobile devices: have been defined as devices that are small, autonomous and unobtrusive to accompany us in every moment (Trifanova et al., 2004; Kukulska-Hulme, 2008, p.273).

Suitable devices: digital media players such as iPods, MP3 players, smart phones such as the Blackberry or iPhone, and Personal Digital Assistants or PDA’s (e.g. Palm, or Pocket PC) (Evans, 2007, p. 492).

CHAPTER 2: LITERATURE REVIEW

The purpose of this chapter is to provide an overview of the literature on online or distance education and the use of assistive technologies and self-efficacy for college students with disabilities. The research explored student experiences in using assistive technologies such as mobile media and how their self-efficacy and level of engagement in taking online courses affects learning. Research-related areas such as self-efficacy, social cognitive theory, and Scherer's Matching Person and Technology (MPT) model are discussed.

This literature integrates theoretical models such as social cognitive psychology and Scherer's Matching Person and Technology (MPT) model with the framework of universal design. The research explored the experiences of students with disabilities in online courses and looks at the self-efficacy, specifically computer and academic efficacy, of students with disabilities. This dissertation looks at how students' computer self-efficacy or their beliefs in their own capabilities to manage in online environments can foster or hinder their success. This chapter discusses the aforementioned theories, provides a historical background on students with disabilities, and also provides evidence-based research with regards to areas such as self-efficacy and assistive technologies in online environments.

The overarching aim of this dissertation is to explore the online learning or e-learning experiences of students with disabilities. Using a multifaceted and integrative approach, this dissertation considers a framework of universal design, Scherer's Matching Person and Technology model and theories such as social cognitive theory to help strengthen the study by using theory triangulation (Denzin, 1978; Patton, 2002). By

proposing these constructs, this study aims to provide a more comprehensive understanding of the experiences of student with disabilities in online environments and add to the literature on students with disabilities in online environments with consideration to their self-efficacy and their use of assistive technologies.

Students with Disabilities

Despite continuing academic difficulties, the amount of students with disabilities (SWDs) enrolling in higher educational institutions has increased even though they have been underrepresented in history (Beilke & Yssel, 1999; Shevlin, Kenny, & McNeela, 2004; Barnard-Brak, Lechtenberger & Lan, 2010). Since 1978, the amount of self-identified postsecondary students has quadrupled (Michaels, Prezant & Jackson, 2002). This growth can be credited to the 1990 Americans with Disabilities Act (ADA) which extended antidiscrimination laws under Section 504 to institutions in higher education (Kosine, 2007). The ADA was amended in 2008 in order to broaden its scope (Myers & Bastian, 2010). Under the ADA, the term “disability” refers to a mental or physical impairment that is limiting the main life activities of an individual and requires postsecondary education institutions to arrange for accommodations that are reasonable in various areas such as academics, examinations, evaluations, housing and recreational facilities (Barnard-Brak, Lechtenberger & Lan, 2010). This legislation provided equal opportunities for people with disabilities to partake in all aspects of society, which also includes pursuing postsecondary educational studies (Myers & Bastian, 2010). In further regulations, schools were also required to begin planning for post-school transitions, under the reauthorization of the Individuals with Disabilities Education Act (IDEA) in 1997. The IDEA was most recently updated in 2004 to require that Individualized

Education Program (IEP) teams provide transition planning beginning not later than when the student was 16 years old, with the plan being updated annually (Kosine, 2007). According to the National Center for Education Statistics (2003), 11.3% of students with disabilities were enrolled in postsecondary education. In elementary and secondary education, it is the responsibility of the school to identify their students with special needs and provide these students with accommodations and support services that are necessary (Barnard-Brak & Sulak, 2010). However, in postsecondary education institutions, students with disabilities have to request accommodations from their educational institution in order to receive these services (Barnard-Brak & Sulak, 2010).

The research also discussed how the increase in students with learning disabilities seeking a postsecondary education has been strong; in 2000, over 40% of freshmen in college with disabilities had a diagnosis of either Learning Disability (LD) or attention-deficit/hyperactivity disorder (Sparks & Lovett, 2009; Henderson, 2001). According to Sparks and Lovett (2009), the rise in students with LD in postsecondary programs can be credited to the variety of services that higher education institutions now have in place for these students. However, other research suggests that numerous students with learning disabilities who enroll in higher education institutions have trouble finishing their postsecondary academic programs (Mull, Sitlington and Alper, 2001). Once students with LD have been enrolled and admitted to postsecondary institutions, they usually need help staying and graduating (Brinckerhoff, Shaw, & McGuire, 1993; Vogel & Adelman, 1993; Mull, Sitlington and Alper, 2001).

Within shifting postsecondary environments, students with disabilities feel overwhelmed, which can result in low graduation and retention rates (Gretzel, Stodden,

& Briel, 2001; Wille-Gregory, Graham, & Hughes, 1995). Studies suggest that more research is necessary on the types of support needed and the influence on the outcomes of these students (Getzel, McManus, & Briel, 2004). Even though students with disabilities are now attending higher education institutions in greater numbers, they continue to feel isolated (Myers & Bastian, 2010). A lack of awareness or knowledge regarding students with disabilities can create disability stereotyping and also create a level of uneasiness for these individuals when communicating (Myers & Bastian, 2010).

Concurrently, considerable advancements in assistive and instructional technology may be an equalizing agent for students with disabilities in promoting greater access to information and learning (Higgins & Zvi, 1995; Michaels, 2000; Raskind & Higgins, 1998; Michaels, Prezant & Jackson, 2002;). Although students with disabilities may struggle with the shift of responsibility in receiving accommodations and services in an online environment, Moisey (2004) found that 7% of students did not request accommodations in their online course and resolved that students with disabilities do not have particular problems requesting accommodations in this online environment (Barnard-Brak & Sulak, 2010). Implications for practice in a synthesis study indicated that students need to be trained in the use of assistive technology devices, should be prepared to determine which accommodations and supports will be needed as they enter college, and should know how to access these supports and accommodations (Mull, Sitlington, & Alper, 2001).

Social Cognitive Theory

Social Cognitive theory was developed by Bandura (1986) and assumes that motivational processes influence learning and performance (Schunk, Pintrich, & Meece,

2008; Schunk, 1995). Social cognitive theory assumes a perspective that is agentic to self-development, change, and adaptation where one can intentionally influence their functioning and life situations. (Bandura, 2001; Bandura, 2005). Bandura defines agency as “the power to originate actions for given purposes” (Bandura, 1997, p. 3). According to Bandura, beliefs about a person’s efficacy are key in human agency (Bandura, 1997; Martin, 2004). Martin (2004) states that, since the mid 1970’s, Bandura has dedicated the bulk of his time to the study of human agency as facilitated by personal efficacy beliefs.

Bandura’s social cognitive theory proposed that peoples’ behaviors can usually be foretold by their own beliefs they have in their abilities, otherwise referred to by him as self-efficacy beliefs (Pajares, 2003). In Bandura’s social cognitive theory, he proposes that individuals have a self-system that allows them to employ control over their thinking, moods and actions (Bandura, 1986). This self-system stores an individual’s cognitive and affective structures and also includes his/her capacity to symbolize, learn from other people, plan alternate strategies, take part in self-reflection, and also learn how to regulate their behavior (Pajares, 1996).

In social cognitive theory, self-referent thoughts play a role between knowledge and action, and, through self-reflection, a person can evaluate his/her own experiences and thought processes (Bandura, 1986). In this view, an individual’s knowledge, skills, and prior achievements are seen as poor predictors of coming attainments because of the belief that individuals hold about their own capabilities and how their efforts can significantly influence how they behave (Pajares, 1996). Bandura viewed self-reflection as the most uniquely human capability because he believed that, through self-reflection,

people could evaluate and alter their own thinking and behavior (Bandura, 1986; Pajares, 1996).

According to Bandura (1991) self-regulation is key in social cognitive theory, because it allows for mediation of the effects of most external influences, but allows for purposeful actions (p. 248). This is manifested through peoples beliefs in what they can achieve, how they deal with the consequences of prospective actions, whether they set goals for themselves, and how they plan courses of actions that produced desired outcomes (Bandura, 1991). According to Pajares (1996), people will engage in tasks about which they feel competent and confident and will avoid those in which they feel less competent and confident. Social Cognitive theory views people as self-organizing, self-regulating, proactive and self-reflective and as contributors to their life circumstances and not just products of them (Bandura, 2005). According to Bandura's (1986) framework of triadic reciprocity, "people are neither driven by inner forces nor automatically shaped and controlled by external stimuli, rather human functioning is explained in terms of behavior, cognitive and other personal factors, and environmental events which all operate as interacting determinants of each other" (p.18). This personal-environmental factor interaction can be found in students with learning disabilities, many of whom hold a low sense of self-efficacy for performing well (Licht & Kistner, 1986; Schunk, Pintrich, & Meece, 2008).

Bandura's Social Cognitive Theory (SCT) provides the theoretical background for this study in that self-efficacy influences the academic performance of students by increasing their sense of well-being and the persistence they have to master difficult

academic tasks, which then results in acquired knowledge and skills (Bandura, 1982; Bresó, Schaufeli & Salanova, 2011).

Self-Efficacy

Self-efficacy refers to the belief in one's own abilities to organize and take action required to produce given attainments (Bandura, 1997, p. 3). Self-efficacy is defined as an individual's judgment of his/her capabilities to execute the courses of action required in order to attain a desired outcome (Bresó, Schaufeli & Salanova, 2011, p.340). It is concerned with the approximation of what an individual can achieve with the skills he/she currently possesses (Bandura 1986; Bresó, Schaufeli & Salanova, 2011). Self-Efficacy theory also says that what we believe about ourselves can have a strong influence on our choice of task, our degree of effort, our diligence and resilience and on our ultimate performance (Bandura, 1997). Self-efficacy beliefs have been found to be one of the most powerful factors that predict performance in areas such as education (Klassen et al., 2007). Self-efficacy beliefs can influence a specific course of action an individual decides to pursue, the effort they use, their ability to persevere in the face of trials and disappointments, their resilience and ability to deal with the demands with the course that was chosen (Chemers, Hu & Garcia, 2001).

Students high in academic self-efficacy can make better use of effective cognitive learning strategies, because they can manage their time and learning environments more effectively and are better at regulating and monitoring the amount of effort they use (Chemers, Hu & Garcia, 2001). Students who are self-efficacious tend to test alternative courses of action when they do not achieve success. These students have positive beliefs about their own abilities and self-worth, are confident in their strategies to self-regulate,

and engage in academic tasks with more positivity than students who are doubtful of their abilities (Bandura, 1997; Eccles, 1983). People having low self-efficacy for accomplishing a task may avoid it, while those who believe they have the ability are likely to participate (Schunk, Pintrich, & Meece, 2008). The motivational impact of self-efficacy can be powerful. When self-efficacy perceptions are high, students will participate in tasks and activities that nurture their skills and abilities, but when students have low self-efficacy, people will not participate these new tasks that may help them develop these skills (Bandura, 1997).

A number of studies have shown that students who have a high sense of academic efficacy show more persistence, put more effort and have intrinsic interest in their own learning and performance (Schunk, 1984, 1989; Zimmerman, Bandura, Martinez-Pons, 1992). A broad body of research has contributed to the literature on self-efficacy and has shown that academic self-efficacy is proportionate to the GPA of undergraduates (Hackett et al. 1992; Lent et al. 1984; Multon et al. 1991) and performance (Bandura 1986; Klomegah 2007; Schunk 1995; Zimmerman and Bandura, 1994; Bresó, Schaufeli & Salanova, 2011). According to Zajacova, Lynch and Espenshaded (2005), in academic environments, academic self-efficacy, rather than general self-efficacy, should be measured, as it relates to a student's confidence in his/her ability to carry out academic tasks. Recent evidence suggests that individuals with learning disabilities are overly optimistic in rating their level of self-efficacy (Klassen, 2007). Schunk, Pintrich and Meece (2008) state that "grossly optimistic efficacy beliefs can lead individuals to attempt tasks that are far beyond their skills and result in aversive consequences" (p.141). Specifically in academic domains, students who choose academic tasks that greatly

exceed their level of skill can experience countless failures and debilitating efficacy beliefs as a consequence (Schunk, Pintrich & Meece, 2008).

In addition, the perceived self-efficacy can play a part in the level of goal challenge that students set, the effort they use, and student's persistence in the face of obstacles (Zimmerman, Bandura, Martinez-Pons, 1992). The results from a meta-analysis showed that efficacy beliefs add considerably to the level of motivation and performance of individuals, predicting not only the behavioral functioning between individuals at varying levels of perceived self-efficacy, but also the changes in functioning at different levels of efficacy over time and variation among the same person in tasks performed (Bandura & Locke, 2003).

Computer Self-Efficacy

As students perceive their academic coursework with a sense of their own capabilities, they also approach using computers with a belief about what they will be accomplishing or what they are about to accomplish (Spence & Usher, 2007). Computer self-efficacy beliefs are associated with the degree to which individuals are willing to use computers (Lim, 2001; Mcilroy, Sadler, & Boojawon, 2007; Spence & Usher, 2007). According to Wilfong (2006), students with higher computer self-efficacy are the students who tend to show less anxiety when they are faced with approaching technology-related tasks (Spence & Usher, 2007). Spence and Usher (2007) considered the importance of the link between success in online environments and students' belief about their abilities to manage their learning environment and how little research has been done to examine this relationship.

This study explored how students' computer self-efficacy to manage in online environments can foster or hinder their performance. By looking at computer self-efficacy of students with disabilities taking online courses, this study provides richer insights into how educators can better support students in online learning environments.

The literature review process consisted of a search of various databases such as Sage, PsychoInfo and ERIC databases for literature using keywords such as “computer self-efficacy,” “self-efficacy and computer environments” and self-efficacy and online and college.” In a literature review study, researchers' findings indicate that few studies examine the relationship between computer self-efficacy and learning outcomes. Also, while some studies show that computer self-efficacy is positively related to learning outcomes, other studies suggest that the relationship between computer self-efficacy and learning outcomes is one that changes with the acquisition of knowledge (Moos & Azevedo, 2009). This gives evidence to support further research with consideration to measuring computer self-efficacy at various points during the learning process in computer-based learning environments (Moos & Azevedo, 2009). Other studies show that individual disparities in computer self-efficacy can explain why there are individual differences in how students use computer-based learning environments (Moos & Azevedo, 2009).

Universal Design

Universal design (UD) originated in the field of architecture as a way to respond to legislated architectural requirements as well as changes in society and the economy that called for providing access for individuals with disabilities (Center for Universal Design [CUD], 2007; Higbee, 2009, p. 65). Ronald Mace, an architect and wheelchair

user, introduced the revolutionary idea that the physical environment should be proactively designed to meet the needs of individuals with disabilities who access these spaces (Wilkoff & Abed, 1994; McGuire, Scott, & Shaw, 2006, p. 167). Mace suggested that design fields should examine the needs of individuals with disabilities and use this awareness to inform product design that is more useful to a diverse and broad range of people (McGuire, Scott, & Shaw, 2006, p. 167). When implementing universal design, architects needed to take into account the needs of all potential users.

In using universal design, architects found that participants or occupants benefited when they provided an architectural feature that enhanced accessibility and inclusion of the population (Higbee, 2009). The phrase “universal design” was coined to echo a proactive approach of incorporating inclusive design features while minimizing the need for individual, retrofitted accommodations (Center for Universal Design, 1997; McGuire, Scott & Shaw, 2006, p.167). Mace and his colleagues at the Center for Universal Design at North Carolina State University (NCSU) defined Universal Design as “the design of products and environments to be usable by all people to the greatest extent possible without the need for adaptation or specialized design” (Center for Universal Design, 1997, para. 1; McGuire, Scott & Shaw, 2006, p. 167).

With the passage of the Americans with Disabilities Act (ADA) in 1990, higher education institutions in the United States were faced with making their campuses physically accessible to all students. The ADA not only mandated physical spaces but also courses, curricula and academic programs be accessible for all students with documented disabilities (Higbee, 2009). As a way of achieving better access, universal design principles (CUD, 1997) have been modified to the field of education through

various models that have arisen in the last decade, such as Universal Design for Learning (UDL, Center for Applied Special Technology, n.d.; Rose, 2001; Rose, Harbour, Johnston, Daley, & Abarbanell, 2008; Rose & Meyere, 2000), Universal Design of Instruction (UDI; Burgstahler & Cory, 2008; Scott, McGuire, & Shaw, 2001, 2003), and Universal Instructional Design (UID; Silver, Bourke, & Strehorn, 1998, Higbee, 2009, p.66).

In Universal Instructional Design (UID), one of the main principles is exploring the use of natural supports for learning, including technology that enhances opportunities for all learners (Chickering & Gamson, 1987; Higbee, 2009, p. 66). This dissertation considered and explored UID in this capacity and focuses on the experiences of students with disabilities in the use of assistive technologies in online environments. A study at the University of Guelph in Canada examined universal instructional design principles, and the researchers found there was a significant relationship between the level of UID in a course and a student's sense of self-efficacy (McGuire, Scott, & Shaw, 2006). The results in this study provide evidence that serves to strengthen the topic of this dissertation, as it relates to self-efficacy of students with disabilities in online courses and in their use of assistive technologies to support their learning.

Educators in recent years have adopted the term Universal Design for Learning (UDL) to describe information that is accessible to all students through a curriculum (Simoncelli & Hinson, 2008). One premise of UDL is that a curriculum should have options that make learning accessible and appropriate to students with diverse backgrounds, abilities, learning styles and disabilities (Simoncelli & Hinson, 2008). Effective UDL is meant to offer flexibility and also the inclusion of alternatives to adjust

to the countless variations in learner needs, styles, and preferences (Rose, 2005; Simoncelli & Hinson, 2008). In 2002, the U.S. Department of Education Commission on Excellence in Special Education recommended that all the measures that were used to assess accountability and educational progress be developed tailored to the principles of universal design (U.S Department of Education, 2002, p. 27; McGuire, Scott & Shaw, 2006). According to Simoncelli and Hinson (2008), education is an exercise in building the knowledge and skills of learners and entails a subtle balance of support and effort. Simoncelli and Hinson (2008) go on to state that universal design for access provides the greatest amount of support possible at all times, while Universal Design for Learning requires careful attention to the goals of any given learning experience so there is a balance of support and challenge in order to maximize opportunities to learn (Rose, 2005; Simoncelli & Hinson, 2008, p. 219).

Matching Person and Technology Model (MPT)

Technology can enhance a person's life and create opportunities and access to individuals with disabilities in various environments (Scherer, 1992). The Matching Person and Technology Model proposed by Scherer (1992) considers the environment and social context of varying situations in which a device is used (known as the Milieu characteristics): users' interests, their needs and capabilities, their goals and expectations (referred to as the Person Characteristic;) and the functional limitations of the technology itself (Technology Characteristics). The MPT model is a collaborative process where educators, students, and parents are included in making informed decisions about the use of assistive technologies (Scherer & Mckee, 1992). The model was derived from studies of assistive technologies or AT users and non-users and is a way of organizing the

various influences on the use or non-use of AT according to characteristics in the environment and the psychosocial setting (Scherer, 1996).

In researching this model using CSA Illumina, ERIC, and other databases such as Google Scholar, two papers that were presented at conferences were found and a few research articles were found that specifically mentioned MPT. While this model has been used in various capacities to assist learners with the most effective technology, it is beneficial to this study as it adds an integrative component to the research. Since the focus of this dissertation is on students with disabilities and their experiences in taking online courses, with particular attention to assistive technologies such as mobile media devices, this model provides a broader lens in which to support this study in that it considers the technology students are using, the environment in which they are using it, and the applicability of the technology to the students' needs.

Online/Distance Education

Technology has become entangled in today's educational environments and in many postsecondary college campuses. The rising availability of internet access, multimedia technologies such as blackboard, Microsoft PowerPoint, and smart boards as tools for traditional learning environments (face-to-face), online, and hybrid classes have been a benefit for distance learning programs (Buckley & Smith, 2007; Hanna, 1998; Mbilinyi, 2006; Stewart, Choi & Mallery, 2010). Improvements in technology have created countless opportunities for learning among students with disabilities by providing broader access to education, information, and learning (Li & Irby, 2008). Technology has opened the doors of modern classrooms to students with diverse needs because it allows access to the curriculum (Castleberry & Evers, 2010). The Internet has become an

important resource because it provides access to the world and provides students with the opportunity to engage with peers (Castleberry & Evers, 2010).

As required by the Americans with Disabilities Act of 1990, instructors teaching online courses are required by federal legislation to make reasonable modifications to accommodate the needs of students with disabilities (Simoncelli & Hinson, 2008). When a college or higher education institution has not applied guidelines for courses online, accommodations for online courses have to be made on an impromptu basis, which, as a result, may be subject to the discretion of the faculty member or instructor teaching the class, the department or the university (Bernard-Brak & Sulak, 2010). Since accommodations in higher education involve issues of access, these ad hoc accommodations may affect the institutions' compliance with legal statutes surrounding accommodations and access (Bernard-Brak & Sulak, 2010). With the increasing number of students with disabilities entering postsecondary education, as well as the rapid growth of online courses and use of mobile media devices, this study aims to provide stronger evidence for the consideration of the impact of online courses on the ability of students with disabilities to engage with their peers, on their self-efficacy, and on their learning in distance education.

Review of the literature suggests that young adults with disabilities usually continue to live with their parents after graduation from high school (Vetter, 1983, in Moccia et al., 1989; Burgstahler, Cronheim & Baker, 1997) and engage in fewer social activities than their peers without disabilities (White et al., 1980, in Moccia et al., 1989; Burgstahler, Cronheim & Baker, 1997). According to the literature, the main difference between online education and the traditional classroom environment courses is that

distance education gives students more choices in accessing information, information delivery, and assessment of learning objectives and course content (Howard & Discenza, 2000; Mehrotra et al., 2001; Banerjee & Brinckerhoff, 2002). The increase in distance education courses at the postsecondary education level is in part due to growing competition among higher educational institutions to be on the cutting edge of information (Banerjee & Brinckerhoff, 2002), and also due to the fact that distance education offers an opportunity to attract a larger population of students, both non-traditional and traditional from all over the world. People using computers and networking technologies now have opportunities to connect with people separated by time and space, creating opportunities to meet that may not have been there. Through the use of computer technologies, students can learn in the ways that people learn best, through sharing information with their peers, questioning information, weighing arguments, and active learning (Harasim, 1990; Burghstahler, Cronheim & Baker, 1997).

However, according to Schmetzke (2001), the notion that online distance learning signifies a transition of postsecondary education being accessible to everyone, anytime and anywhere is not accurate, and students with disabilities can experience a second digital divide (Burghstahler, 2003), becoming outperformed in the online environment without the access, accommodations, and assistive technologies needed (Bernard-Brak & Sulak, 2010). The growing use of instructional technology is a new reality of the postsecondary experience of all students (Fichten et al., 2000; Lance, 1996; Michaels, Prezant & Jackson, 2002), yet many professors lack the knowledge and skills necessary to ensure equal access to electronic course materials for students with disabilities (Fichten et al., 2000; Michaels, Prezant & Jackson, 2002). Former U.S. Secretary of Education

Richard Riley, discussed that it will be important to take into account a variety of assistive technologies at the postsecondary level as well and recommended that postsecondary environments be accessible with regard to the technology (National Joint Committee on Learning Disabilities, 2000; Michaels, Prezant & Jackson, 2002). This research makes a strong argument for online environments to be created to include students with disabilities. (Burghstahler, 2006; Bernard-Brak & Sulak, 2010).

Assistive Technologies

Over the last decade, the use of technology has become an embedded part of the mainstream culture. In educational settings, we see students with iPhones, iPods, tablets, Mac books and other sources of portable media. The entry of assistive technology into postsecondary environments reflects a growing interest in technology and the use of technology in society as a whole (Raskind & Higgins, 1998). Technology used to assist students with disabilities, or assistive technologies, has been receiving considerable attention and gaining more focus in texts (Enders & Hall, 1990; Green & Brightman, 1990).

The phrase “assistive technologies” is defined by the Technology-Related Assistance for Individuals with Disabilities Act of 1988, and is referred to as “any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities” (Scherer, 1996, p. 439). Assistive technologies are typically referred to as enlarged computer keyboards for those individuals who are mobility impaired, print magnification systems for individuals with visual impairments, and speech output devices for individuals with communication

impairments (Raskind, 1993). Raskind (1993) finds that the use of assistive technologies to support students with a learning disability (LD) in higher education institutions compensate for their difficulties and improve their academic success is encouraging.

However, Raskind (1993) goes on to state:

in order to ensure the benefits of assistive technology are achieved, that effort will have to be made to conduct research regarding the extent to which specific contexts influence the compensatory effectiveness of select technologies; the possible relationship between assistive technology use and academic outcomes; the potential benefits in regards to an individual's level of independence, attitudes toward academic tasks, self-esteem and self-understanding; the levels of social participation with regard to technology use; and the determining how students will benefit from assistive technologies in order to ensure the best possible match between the student, technology, task, and context (p.37).

Literature on similar studies, such as the LexDis project which explored the e-learning experiences of disabled learners at a University in the UK, look at increasing understanding of the interactions by disabled learners, and requirements for accessible e-learning, compatible assistive technologies, and learning support. The project ran from March 2007 to February 2009 and used a participatory method to enable the learners' "voice" to be heard and to help inform the practices of lecturers and support staff (Wald, Draffan, & Seale, 2009). The findings of this study indicated that issues that arose for students with disabilities were having to learn about new assistive technologies at the beginning of their studies at the University, which resulted in less time to work online because of the time taken up with dealing with issues related to their disability, and the need to learn to juggle the technologies more effectively and in an effective way to better assist learning (Wald, Draffan, & Seale, 2009). Other projects, such as The ALERT (Accessibility in Learning Environments and Related Technologies) project, suggested that supporting students with course notes would be beneficial to students with and

without disabilities, and referred to Draffin and Rainger's (2006) model, which supports an inclusive approach to identifying the challenges to blended learning and moves towards an integrated, all-encompassing approach that takes into account the needs of all learners, regardless of a defined disability (Wald, Draffin, & Seale, 2009).

Assistive technologies play an integral role in this study, as students' experiences in online environments, specifically with mobile media devices and how this fosters or hinders learning and socialization with peers, are examined.

Mobile Media

As ownership of mobile media devices, such as mobile phones, and use of wireless and other portable devices becomes widespread and gradually more available, the landscape of technology supported learning progressively changes (Kukulska-Hulme, 2009).

Additionally, research shows the use of these technologies has been aligned to educational goals such as improving achievement, student retention, supporting differentiation of the learner's needs, and getting to learners who would not have the chance to participate in education, otherwise (Kukulska-Hulme, 2009). In the classroom setting, mobile media devices have shown to be highly effective in supporting small group collaborative learning, building on what was possible to accomplish without these tools (Zurita & Nussbaum, 2004; Valdivia & Nussbaum, 2007; Kukulska-Hulme, 2009). The review of literature in this section is focused on the increasing use of mobile media devices in various education contexts with particular attention to online distance learning environments. As discussed in the section regarding students with disabilities of this literature review, this population is enrolling in postsecondary education at rapid rates,

and, with the increasing popularity of distance education courses and programs, this study explores the prevalence of mobile media devices by students with disabilities, and whether these devices facilitated their learning where the opportunities to interact in a traditional learning environment are no longer present.

Research of literature on mobile media devices in education, the Education Resources Information Center (ERIC) database, Education Full text Database, and Google Scholar were utilized by search terms such as “mobile media and college,” “mobile media and college students,” “mobile media and higher education,” “assistive technology and students with disabilities,” “mobile media and students with disabilities,” “assistive technology.” While the search on assistive technologies produced significant results, the search in the Education Full Text Database on assistive technologies and students with disabilities produced 140 peer reviewed articles, while search terms involving “mobile media and students with disabilities” produced zero results, which showed a gap in the literature surrounding mobile media devices and students with disabilities.

Mobile devices can support learning in various environments through distance or online courses, as well as in informal settings such as a museum, gallery, garden, and aquarium (Goh & Kinshuk, 2006). Mobile and wireless technologies enable learning to be connected with real world experiments (Kukulska-Hulme, 2009). For example, Kukulska-Hulme (2009) cited the MANOLO project (2006) which showed the benefits of utilizing handheld computers for university level fieldwork in educational programs such as archaeology and environmental sciences. Another project called the MyArtSpace project, utilized mobile phones in which children on a school trip to a museum were able

to access various multimedia content that were linked to particular exhibits and then used this to send photographs, notes captured at the museum and audio recordings to a website which allowed them to share this information and discuss their findings once they returned to the classroom (Sharples et al., 2007; Kukulska-Hulme, 2009).

As ownership of mobile devices becomes more common, learners are able to take the lead and engage in activities motivated by their personal needs and conditions of use, including those arising from better mobility and travel (Kukulska-Hulme, Traxler & Pettit, 2007; Pettit & Kukulska-Hulme, 2007; Kukulska-Hulme, 2008). In the past, mobile learning has been defined in terms of its use of mobile technologies. Recent thinking in research has been grounded in the learners' mobility (Sharples, 2006, Kukulska-Hulme, 2008). Mobile devices have been defined as "devices that are small, autonomous and unobtrusive to accompany us in every moment" (Trifanova et al., 2004; Kukulska-Hulme, 2008, p.273). Evans (2007) described suitable devices as "digital media players such as iPods, MP3 players, smart phones such as the Blackberry or iPhone, and Personal Digital Assistants or PDA's (e.g. Palm, or Pocket PC)" (p. 492).

Mobile learning (m-learning) is an evolving research area, and there are many issues regarding mobile learning that have not been comprehensively covered (Goh & Kinshuk, 2006). Research looking at mobile learning and teaching applications are currently being developed and assessed (Roschelle, Chan, Kinshuk, & Yang, 2004; Mlearn, 2004; Hoppe, Joiner, Milrad & Sharples, 2003; Goh & Kinshuk, 2006) and concluded that mobile learning can complement online learning by creating an additional way to provide access for mobile users with mobile devices such as cell phones, person digital assistants (PDAs) and pocket computers (PCs) (Goh & Kinshuk, 2006).

Postsecondary institutions have adopted the use of virtual learning environments combine include e-learning with their traditional teaching style as part of a blended-learning approach (Evans, 2007). This type of blended approach has the advantage of allowing learners to choose when, where and how they will study, allowing learners to review material and get feedback (Evans & Fan, 2002; Evans, 2007). Mobile learning or m-learning has additional advantages to learners, such the use of portable wireless technologies in various environments. This enables the learner to study on the go, making it easier for him/her to study at the most convenient time, while providing access to necessary information and easier transport. Research suggests that the ability to study while traveling is the primary distinction between m-learning and e-learning environments, since with e-learning often requires access to a desktop computer and the internet (Evans, 2007).

In distance learning environments, m-learning (mobile learning) students can use a 3G video phone to use video conferencing to learn, as in a study conducted by Kanamori and Kobayashi (2004) where a videophone was used to provide education at home to a student with a severe physical impairment. This study showed that the use of the videophone can be an effective educational system with some fine tuning (Goh & Kinshuk, 2006). The use of mobile learning is also becoming popular in medical education. For example, a telemedicine and distance learning system was developed by Britto, Lopes, and Michalkiewicz (2004) that provided access and mobility for doctors traveling across the country to access necessary information and also to input various data (Goh & Kinshuk, 2006). In a study by Brandt, Hillgren and Bjorgvinsson (2003), peer to peer informal learning was facilitated through the use of mobile technology in the

production of real situation videos for communication and learning in an intensive care unit (Goh & Kinshuk, 2006).

There is growing literature on the use of instructional videos for functional skills, which try to incorporate technology and systematic response prompting procedures (Mechling, 2004; Mechling & Cronin, 2006; Mechling, Gast, & Barthold, 2004; Ayres & Gast, 2010). In the review of the literature on video instruction on functional skills, the research supports integrating video into educational settings or instruction for students with developmental disabilities (Ayres & Gast, 2010). Ayres and Gast (2010) found, in all studies they reviewed, that participants regarded the use of video as a total task model prior to engagement of the task. Ayres and Gast (2010) suggested that providing support for the mixture of video instruction paired with computer delivered response prompt strategies implied that video supported instruction can be an integral tool for educators. Added benefits of video over live situations or models include creating an authentic training environment where students are able to relate to real experiences (Wissick, Gardner & Langone, 1999; Ayres & Gast, 2010) by downloading footage onto portable devices such as PDAs, iPods and iPhones which are then played on demand. This type of access provides advantages in places where live models are not readily available (Mechling, Gast, & Fields, 2008; Ayres & Gast, 2010). These portable devices provided students the opportunity to use video prompts to acquire new knowledge and skills and transfer learned skills across new settings with virtual ease (Ayres & Gast, 2010). Ayres and Gast (2010) evaluated the use of video modeling on learners with moderate intellectual functioning by using a computer to teach independent use of an iPod to access videos, music and photos. This study conducted by Ayers and Gast (2010) was designed

as an initial step in progressing toward a model where learners in the situation utilize video.

According to Becker (2010), today, an individual can walk into any campus library and see students typing, touching, or clicking their way through their college libraries' website. With the increased access of mobile media devices giving students the ability to obtain information from anywhere, higher education institutions need to make sure that even the already established resources for students can be easily accessible to the growing population of mobile users. Becker (2010) references the Horizon Report, which considered mobile media devices as places to store learning experiences as well as reference materials. While many postsecondary institutions have established a strong presence in the online community, there is a need to ensure that resources are also accessible to this population (Becker, 2010).

Conclusion

The range of technology use today varies from people who use it regularly to those who use it infrequently and with hesitation. Assistive technologies were designed to improve access, enable an individual to increase independence and mobility, and serve to improve quality of life for individuals with disabilities. This chapter provided evidence-based research of the literature used to strengthen this study. The potential for assistive technologies to help meet educational needs is evident from the research, but this study explores the experiences of students with disabilities with AT in distance education courses as well as their self-efficacy in using technology such as mobile media devices and how this influences their learning in an online environment. This chapter provided a comprehensive look at the literature on distance education, assistive technologies, mobile

media, and self-efficacy. It also introduced a multifaceted integrative and triangulated theoretical background for this qualitative study by considering social cognitive theory, universal design and the Matching Person and Technology Model.

The findings in this study aimed to contribute to a growing body of educational research on practitioners can help students with disabilities learn effectively in online environments by considering universal design and issues regarding access. This study provided a personal, in-depth understanding of students' experiences in online courses. It explored their use of assistive technologies such as mobile media devices and how students' self-efficacy in taking online courses can affect their learning. Pajares (2006) discussed how students with high self-efficacy, regardless of their previous successes or abilities, can persist in the face of challenges or adversities, and how they tend to have lower stress levels, and achieve more. This study attempted to extend the link between motivation, learning, technology, and the social environment by considering how all of these factors affect the experiences students with disabilities in online courses and seeks to provide evidence on how educators can better support students' learning through access and education in online educational settings.

CHAPTER 3: METHODOLOGY

Design Summary

The purpose of this study was to explore the experiences of students with disabilities in an online educational environment with regard to their self-efficacy and their use of assistive technology such as mobile media. Integrating a mixed methods research design, it attempts to broaden the understanding of students with disabilities in this study and look at how their experiences in online courses can hinder or foster their success in these courses. This study contributes to the research literature on distance education, e-learning or online courses and students with disabilities. Chapter one presented the importance of exploring the experiences of students with disabilities in online courses (SWDs), and also the problems that SWDs can face when taking these courses, such as issues with access and communication. Chapter two provides the theoretical foundation for the importance of exploring the experiences of students in this online educational setting, and the empirical evidence that describes how students' learning and ultimate success in these courses may be affected. Based on the information discussed in the first two chapters, the following research questions are addressed in this study:

- 1) What are the experiences of college students with disabilities taking online or distance education courses?
- 2) What are the experiences of college students with disabilities enrolled in online courses in regards to using assistive technologies and mobile media devices?
- 3) How does taking online courses affect students' self- efficacy?

Patton (2002) describes that “qualitative inquiry cultivates the most useful of all human capacities: the capacity to learn” (p.1). Exploring the experiences of SWDs taking online courses is best understood through a qualitative approach because it allows us the opportunity to understand how SWDs in this online educational environment engage and learn most effectively. It is phenomenological research that emerges from in depth interviews from those who have directly experienced the phenomenon (Patton, 2002, p. 104), or, in this case, students who have taken an online course, that provides richer context for exploration in this study. In qualitative research, there is a special emphasis on the purpose of the study and the audience, and this can help provide depth and detail to the study (Patton, 2002). Creswell (2009) describes qualitative research as “a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem” (p.4). This process involves data that is usually collected in the participant’s setting, data analysis that is inductive in style and focused on individual meaning (Creswell, 2009) and also focused on understanding the complexity of a situation (Creswell, 2007;2009).

The qualitative designs used in this study are purposeful sampling, through which small samples were selected in order to learn more about the issues of importance to this study, and theory triangulation, by which the multiple theories described in chapters one and two help to inform and interpret the data. Through purposeful sampling and theory triangulation, it seeks to understand what the barriers are for students with disabilities who take online courses and their use of assistive technologies such as mobile media. It also explores how their self-efficacy in these courses can influence their learning. According to Patton (2002), the validity, meaningfulness, and insights produced from

qualitative research have to deal with the information richness of the actual cases that are chosen for the study. In choosing a purposeful sample, this study aims to provide an in depth account of the experiences of students with disabilities in taking online courses. Triangulation in a study strengthens it by combining methods (Patton, 2002). Through triangulation, this study combines both interviewing and observations. It mixes different types of purposeful sampling, such as intensity and opportunity sampling (Patton, 2002), and examines how various theoretical perspectives can better inform the study.

Participants and Setting

In this section, the population and context of the study are described along with the specific sample selected for analysis. The description of the participants includes discussion of the background and setting of the site selected.

Participants

Qualitative. The participants in the study were college students who were identified as having a diagnosed disability. The participants were registered with their respective college campuses' Disability Services and Programs or Disability Services Office. The participants were selected through purposeful sampling in that their cases were chosen by the primary assistive technology staff member at the site because of purpose of the study. Staff members in the Disabilities Services Office asked the participants if they would like to volunteer to be a part of this study regarding their experience in taking online courses. There were 10 participants chosen from the site used in this study, however only 9 were used due to recording error. The participants ranged in age from 18 to 50 and were at different stages in their academic programs. The criteria to participate in the study include being a current student in the college or university, being

registered with the respective Disabilities Services Office on campus, and having taken an online course at their educational institution.

Quantitative. A recruitment email and information fact sheet were sent through the campus Disabilities Services Office list serve, inviting students to participate in the study by taking a survey. Participants made their decision to participate privately and voluntarily and were free to decide not to participate without coercion or pressure. Interested students were sent an informed consent form, and a link to the survey called the Computer User Self-Efficacy Scale (CUSE).

Site Selection

The setting of the study was a large two-year campus in Southern California which serves mostly undergraduate two-year students. The main campus and surrounding area of the campus is located in a midsize city within an urban area with a population of approximately 100,000 to 250,000 people. The institution participates in Title IV federal financial aid programs where the terminal degree for students is the Associates degree. The student enrollment at the time of this study was approximately 7000 to 10,000, with an approximate student to faculty ratio of 20:1. The college has a high transfer rate and has established transfer agreements with several surrounding colleges and universities in the state of California.

Data Collection

Qualitative

The Data for this study was collected primarily from face-to face individual interviews with each of the participants from September 2011 to December 2011. After the study was approved by the Institutional Review Board (IRB) at the University of

Southern California and at the institution, here named California College (CC), the researcher met with program staff at the college site and had regular telephone and email exchanges to get a consensus on the recruitment plan for the participants of the study. The study utilizes various research methods, including interviews and tape recordings to collect data. The on-campus Student Disability Services Office forwarded the recruitment e-mail message at the request of the researchers via the listserv. When students agreed to participate, all interviews were audio-recorded with the informed consent of the participant. The audio-recordings provided the opportunity for the researcher to revisit the interview and review it as needed. The audio recordings were transcribed and checked for accuracy by re-playing the recordings and comparing the transcriptions against these recordings.

Interviews

The researcher conducted one-on-one semi-structured interviews with program participants in order to obtain an in-depth and comprehensive view of their experiences when taking an online course. Field notes and interviews were used to capture the observations in formal and informal settings. Participation in the study was voluntary and all participants had the opportunity to receive a \$15 gift card for participating in the interview portion of the study. The recruitment plan for this study included an interview and/or survey with students who have taken a course in an online environment. The study participants were contacted via a recruitment email (Appendix A) in addition to the assistance provided by the site's key informants (2 staff members in program). The study participants were be required to sign the consent forms (Appendix C) before they are interviewed, and they were required to speak English and to meet the criteria (Appendix

B) for the study. Interviews were scheduled according to students' availability. Each interview was approximately 30-45 minutes in length. All interviews were conducted in English, and were based on a semi-structured interview protocol/guide (Appendix D) at the college's site. An interview guide (Appendix D), developed prior to the interviews, ensured that the same information was obtained from a number of people by covering similar material (Patton, 2002). All interviews were audio-recorded, transcribed verbatim and were qualitatively analyzed to be aligned with the purposes of the study. Permission to audio-record was obtained prior to the start of the data collection. All interviewees in the study were assigned a pseudonym and records were kept in a locked cabinet to ensure confidentiality. Audio-recordings were made of each interview and were professionally transcribed to ensure accuracy.

Surveys

The survey instrument used in this study drew from an already existing survey: the Computer User Self-Efficacy Scale (CUSE) developed by Cassidy and Eachus (2002). The CUSE scale was specifically designed to measure self-efficacy. The CUSE was found to have high levels of internal ($\alpha = .97$) and external reliability ($r = .86$) and construct validity (Cassidy and Eachus, 2002, p. 145). In the new survey used for this study, key questions were linked to measure specific components such as self-efficacy and students with disabilities in an online academic environment. The survey consists of 38 questions (The CUSE scale, which is a 30 item scale, and additional questions regarding students' current year in school, experience taking an online course and student support services they utilized students). Participation in the study was voluntary and all students who participated in the survey portion had the opportunity to provide their e-

mail address to enroll in a raffle for one of five \$20 cash/ gift cards. Five winners were randomly selected from the pool entries and winners were given the opportunity to collect gift-cards/or \$20 cash by December, 2011.

The Role of the Researcher

As participants are introduced to the study, the researcher was mindful of her role and aware of her former status as a Student Specialist in the Disabilities Office at the study site. She repeatedly expressed that her interests were in exploring the individual student's experiences in an online academic environment, emphasizing that she was not there to give feedback or make judgments of faculty or staff.

Data Management

Copies of all data were stored in a locked cabinet at the researcher's home. All data was catalogued and labeled by date and source. To ensure confidentiality, the participants in the study were assigned pseudonyms at the start of the data collection, which were used throughout the data collection and analysis process. Data that link participants to their pseudonyms was password protected. There were backups of all documents, data, and analysis in order to prevent loss of data. Only the dissertation chair and the researcher had access to the full data. The data will be kept for three years after the acceptance of this dissertation.

Data Analysis

Mixed methods research design was used in this study to broaden the understanding of students with disabilities experiences taking online courses by incorporating both qualitative and quantitative research. According to Creswell (2009), four important aspects that may influence the design of procedures for a mixed methods

study are timing, weighting, mixing and theorizing. All aspects were considered. The information was collected concurrently, mixing of the data occurred at the time of data analysis and interpretation. The information was weighted equally and the comprehensive theoretical perspective discussed previously was utilized in this study.

Qualitative

The qualitative portion of this study focused on in-depth small samples selected purposefully, which, according to Patton (2002), leads to information rich cases and a greater understanding of students' experiences with taking online courses. This study utilizes purposeful sampling such as criterion and typical case sampling.

For the purpose of this study, criterion sampling was utilized because students were chosen for the study by meeting the criteria of having a documented disability and having registered with the campus Disability Services and Programs office. The study also utilizes typical case sampling because the site and cases were selected with the cooperation of key informants. Patton (2002) states it is important to get a broad consensus about which cases are typical and what criteria are being used to define typicality. Typicality, in this study, is defined as students who have registered with the Disability Services and Programs office on campus and have provided verification of disability. Using typical case sampling in this study allowed the researcher to describe and illustrate what is typical of the setting for students with disabilities. The qualitative data obtained was analyzed using Creswell's qualitative data analysis framework.

A phenomenological research approach was utilized to inform the analysis process of the qualitative data obtained. Creswell (2009) defines phenomenological research as "a strategy of inquiry in which the researcher identifies the essence of the

human experience about a phenomenon as described by the participants” (p.13).

Understanding the lived experiences marks phenomenology and involves studying a small number of subjects through extended engagement to develop patterns and relationships of meaning (Moustakas, 1994; Creswell; 2009).

The researcher used Creswell’s (2009) qualitative data analysis framework, which consists of six steps. The first step includes organizing and preparing the data information collected, so the researcher transcribed interviews and sorted and arranged the data. Secondly, the researcher read through all the data to obtain a general sense of the information and to reflect on the meaning of the data. The researcher looked for the general ideas that participants were saying, tried to see what the tone of the ideas are, and got an overall impression of the depth and credibility of the information collected. The third step included getting a detailed analysis with an open coding process by hand and by computer, which organized the material into chunks or segments before bringing meaning to the information (Rossman & Rallis, 1998; Creswell, 2009). Fourth, the researcher used the coding process to generate a description of the setting as well as incorporate themes/categories for analysis. The fifth step includes a discussion that mentions the detailed discussion of several themes, such as the presentation of a process model. The researcher developed narrative passages and descriptive information to discuss the research findings in further depth. Finally, the researcher used the theoretical framework and existing research to interpret or gain meaning from the data.

Quantitative

The quantitative portion of the study focuses on connecting information from the Qualtrics survey of students with disabilities who take online classes to better understand

or build on results from the qualitative data. This notion of using one approach to better explain the other approach, according to Creswell (2009), is a primary reason for employing a mixed methods approach. After consultation with staff at the site's on-campus disability office, it was estimated that approximately 120 students met the qualifying criteria for the present study. The participants had to meet the criteria for the study, which included being a current student, having to be registered with the Disabilities Services office, and having taken an online course. An email was sent to all students registered with the disabilities office, approximately 500 students, and only about 120 qualified for the study. The email included a link to the survey using the Qualtrics Database and included a form on which students provided their consent to participate in the study. The survey consisted of 38 items. The Computer User Self-Efficacy Scale (Cassidy & Eachus, 2002) and demographic characteristics of participants (gender, age, race/ethnicity, grade, disability type, use of support services) were collected. The Computer User Self-Efficacy Scale (Cassidy & Eachus, 2002) is a 30 item scale which was found to have high internal reliability and construct validity. According to Cassidy & Eachus (2002), self-efficacy beliefs have been identified as contributing factors to the successful completion of a task and in understanding the frequency and success with which individuals use computers (Cassidy & Eachus, 2002). This scale was chosen for this study because of its reliability and validity, because it focuses on the measurement of self-efficacy in student computer users, and because it was designed to measure an adult student population.

CHAPTER 4: RESULTS

This mixed methods study explored and analyzed the experiences of students with disabilities taking online courses and how a student's self-efficacy in using computers can affect his/her performance in the course. The study used a multifaceted an integrative approach by considering a framework of universal design, Scherer's matching person and technology model and theory triangulation. The study is grounded in Bandura's social cognitive theory and self-efficacy theory.

By proposing these constructs, this study aimed to provide an in depth understanding of the experiences of students with disabilities in online environments, and add to the literature on students with disabilities in online environments with consideration to their self-efficacy, and the use of assistive technologies. The study also aimed to provide further insights into how students with disabilities can be better supported in their learning in online academic environments.

Participants

The findings discussed include results from the collection of qualitative data with the support of quantitative data (a survey was utilized to further enrich the study). Qualitative data were collected through face to face interviews, although 10 interviews were collected, 9 were used for data purposes due to recording error in one interview (n=9), with a subsample of all 9 participants who completed both the survey and interview. There were 5 male participants and 4 female participants in the interview portion of the study. The interviews consisted of 20 open-ended questions, were approximately 30-45 minutes in length and were primarily developed by the investigator/researcher, including a few questions that were also influenced by Koh's

(2006) study on self-efficacy and technology. At the end of the interview, participants were given the opportunity to provide further comments on their experience in online classes and these were used in the coding of data as well. The data collected from these interviews explored participants' experiences taking online courses, their self-efficacy and use of assistive technologies to support their learning. The Quantitative analysis utilized an online survey which consisted of n=48 respondents, although some respondents did not meet the study criteria or give consent to complete the study, so there were n=42 respondents and face to face interviews (n=9). Quantitative data were collected through a 38 item survey. The survey data collected provided demographic information on participants (gender, race/ethnicity, class year, disability type, use of support services/assistive technologies) which were asked through multiple choice questions. Also embedded in the survey was the Computer User Self-Efficacy Scale (Cassidy & Eachus, 2002). The study's findings are described below and were grouped by the research question they each addressed. Succeeding these findings are summary descriptions.

Demographics Characteristics of Sample from Survey

Prior to investigating the survey results in the present study, it was considered prudent to investigate the composition and characteristics of students with disabilities at the study site, California College. Table 4.1 below shows the respondents' years of study (as self-reported at the college, along with the type of disability most commonly reported on the survey scale. Although the study site was at a two year Community College site in Southern California, as demonstrated from Table 4.1, students reported their years of study at the program (which goes beyond two years which may be attributed to whether

the student is a part time or full time student at the college, or is a reflection of the years of study the student has been taken courses at the study site in general. Table 4.2 provides an overview of the student characteristics investigated.

Table 4.1: Survey Results: Year of Study at Study Site and Most Common Disability Type

Year at College	%	Type of Disability	%
First Year	15.8	ADHD	34.9
Second Year	44.7	Learning Disability	32.6
Third Year	23	Psychological	27.9
Fourth Year	15.8	Other	20.9*

Table 4.2: Demographic Characteristics of Sample Students

Demographic	Descriptive Statistics ^a
n	42
Age	29.62 (11.45)
Race	
Asian	9 (22.5%)
Black or African American	2 (5.0%)
Hispanic or Latino	7 (17.5%)
Middle Eastern	1 (2.5%)
White, Non-Hispanic	19 (47.5%)
Multi-ethnic	2 (5%)
Grade Level	
Freshman	6 (15.8%)
Sophomore	17 (44.7%)
Junior	9 (23.7%)
Senior	6 (15.8%)
Disability	
Deafness/Hearing Impairment	0 (0.0%)
Speech Impairment	2 (4.7%)
Learning Disability	14 (32.6%)
Attention Deficit Disorder	15 (34.9%)
Psychological Disorder	12 (27.9%)
Blindness/Visual Impairment	1 (2.3%)
Mobility/Orthopedic Impairment	6 (14.0%)
Other	9 (20.9%)

^a presented as n (valid percent) or mean (SD) where appropriate

- The “other” category for disabilities included:
 - Anxiety: 1
 - Brain Injury: 2
 - Fibromyalgia: 1
 - Hand & Wrist Dysfunction: 1
 - Multiple Sclerosis: 1
 - Uncontrolled HBP: 1

These demographic results were drawn from the quantitative dataset from the online survey. The sample participants who took the online survey varied in ages from 18-62, the year of study at the college with the highest percentage (44.7%) were students in their 2nd year of study, and the three most common types of disability were Attention Deficit Disorder (34.9%), Learning Disability (32.6%) and Psychological Disorders (27.9%).

Overview of the Findings

The findings are grouped by research question in the proceeding sections. The purpose of each research question and significant findings of both qualitative and quantitative data are discussed. The significance of the findings is also discussed for each research question as it pertains to theory and evidence from the literature review.

The analysis for each question differed depending on the nature of the research question and whether it utilized a qualitative design, quantitative design and/or both. This study included a survey evaluating the computer self-efficacy of students but also explored descriptive statistics of respondents such as race, gender, age, grade level in school, type of disability, and support services utilized. A paired sample t-test was run to examine the role that perceptions of student support services played in online vs. face-to-face academic environments.

Research Question One

Research Question One asked, “What are the experiences of college students with disabilities in online courses?” The goal of the research was to explore the experiences of students with disabilities who are taking online courses. Results are described from qualitative data analysis from 9 face-to-face interviews, which provided in depth

descriptions of participants' experiences in online courses as well as their experience using assistive technologies.

From research question one and interview protocol questions, two primary themes and one subtheme emerged. The two themes were as follows: 1) students overwhelmingly stated that they like the flexibility and pace of the online course; 2) the importance of instructor feedback, response, availability of the instructor and overall interaction with students. This also included the suggestion by students to have instructors be interact with students through chats, discussions or face-to-face. The subtheme that emerged from the study was that at 4 out of 9 students in the sample did not disclose their disability to their instructor in the online course, while if they were taking a class in a traditional setting, they may have been more apt to disclose their disability.

The next Table (Table 4.3) below provided a list of the interviews conducted along with the pseudonyms assigned to each participant , as well as the students self-report of their academic major at the Community College. For the qualitative analysis there were 9 open-ended semi-structured interviews conducted at the college study site. Student's voluntarily participated in the study and at the end of interview they received a \$15 gift card.

Table 4.3: Pseudonyms for Interview Participants

Interviews Conducted	Pseudonyms Assigned	Major
Interview 1	Sean	Criminal Justice
Interview 2	Gilbert	Computer Science
Interview 3	Carrie	Digital Media Arts
Interview 4	Mary	Psychology/Social Behavior
Interview 5	Tom	Biological Sciences
Interview 6	Ben	Psychology
Interview 7	Sarah	Business Administration
Interview 8	Michael	Biochemistry
Interview 9	Diana	Psychology

Results: Research Question One

The increase in online courses at the postsecondary education level is due to increasing competition among higher education institutions to be on the cutting edge of information (Banerjee & Brinckerhoff, 2002). According to the literature review, a main distinction between distance or online education and a traditional classroom setting is that there are more choices in access to information, delivery of information, and assessment of learning objectives and course content (Howard & Discenza, 2000; Mehrotra et al., 2001; Banerjee & Brinckerhoff, 2002) in online courses. Students using computers and other modern technologies now have opportunities to connect with people globally; creating opportunities to meet that were not there before (Banerjee & Brinckerhoff, 2002). Results from the qualitative data were aligned with the literature review and support the finding that online courses offer more choices to course information, delivery of information and course content, and also allow students to connect with each other in various ways, especially when a student's disability limits physical access to campus. A theme that developed from the study was that students overwhelmingly stated that they like the flexibility and pace of the online course.

For example, one student discussed the flexibility of the course as follows: First of all, for items what I did like about online classes is the flexibility. You can almost pace yourself as, as far as learning the material and I also liked that you don't have to commute to school, to find parking, and deal with the whole rush at the beginning of the semester especially. And usually, I mean, if it's a 100 percent online class you're exams are usually taken at a specific time in your own home but, again, you don't have to be in a certain location on campus.

(Michael)

Another student discussed the following:

Well, I think I struggled, and I think I progressed more with the online because I was having problems – actually, I flunked a couple of classes face to face, and then when I took the class online, I passed it. It took twice when I passed it. I understood it more. I understood it more at my own pace.

I felt more pressure face to face because I – maybe it was the instructor that I didn't understand, or he wasn't addressing that I could understand it. By putting it on the chalkboard and keep going on, erasing the chalkboard, it's gone. This online, it's there in front of you, you can go over it, you can decipher it, you can write it down. It's there for you, you've got your pace at taking it off, and that helped out a lot for me.

(Sean)

Participants expressed that they liked being able to read over the course material and lectures at their own convenience and found that having this flexibility was tremendously helpful in actually learning the material. Two students discussed the following regarding being able to access information:

One important thing that I did like is that you can replay a concept that you didn't understand or terms. Then I could replay it and take down notes more accurately.

(Sarah)

I'm not much of an in class learner and studying by myself is a lot more helpful. So I like it a lot more because I can sit quietly over my computer and look through the book and look at Power Points and really understand the concept instead of trying to recognize patterns that are done in the classroom.

(Tom)

Another dominant theme was instructor feedback, response, availability of the instructor and overall interaction with students. The majority of the interview participants

(6 out of 9) discussed how they would have liked the instructor to be more responsive, organized, and interactive with students. Students discussed how they felt that there should be at least an opportunity to engage or interact with the instructor during the online course. One student stated:

Maybe like once a week or once in two weeks a professor can have like a discussion session like in person rather than emailing back and forth because when you ask a question, I tend to forget in a day or two. So when you're in a live discussion you get your answers right away and you're able to absorb the information together and not in pieces.

(Mary)

Another student stated the following:

One thing that I dislike is kind of like I was saying, you don't have the instructor there to help you out. It's harder to ask questions. It's different asking questions via email than it is just raising your hand in class.

(Ben)

The students who had a positive experience with their instructors also discussed how important they felt instructor communication is. One student discussed:

I think it's the instructors and how they take care of the students and they care and that you're very close to the instructor online, whereas most people think that an online course isn't going to do that, that you're not close to the teacher because you have not face to face contact but it's not like that.

(Gilbert)

Students also consistently discussed the need for engagement with the instructor through either online chats and discussions and at least a few opportunities to meet face to face. A student from the face-to-face interviews discussed her own experience taking an online course as a student with a learning disability.

Since I'm more of an auditory learner, I think that for the most part I don't feel that online courses are set up for people with learning disabilities. I think they're very rigid, very strict, and I don't feel like there's a lot of leeway, and I feel like when I can go to my professor and sit down with him and at least having the availability of your professor, seeing him there so you can kind of linger after

class and talk to him and say, “I’m having problems with this or this area.” So I think there’s such a huge disconnect between student and teacher online. Maybe if they’re online instructors, maybe they should have more office hour time. I can’t remember what his office hours were, but it wasn’t something that the instructor pushed.

(Diana)

When asked what how the format of the online course could have been designed better to meet their needs a student from the face to face interviews responded with the following:

“Maybe a Q&A session for the teacher because you wanted to ask questions and a live session moment... Maybe periodic live discussions if there were some kind of chat room voice thing, so you could talk with a teacher online or you can once in a while – maybe just even once every few weeks being able to meet the teacher in person and just talking about the class. Not really like a lecture, more of a discussion between students and the professor.”

(Tom)

Subtheme

And lastly, a subtheme that emerged in the qualitative analysis was that at 4 out of 9 students did not disclose their disability to their instructor in the online course, while, if they were taking a class in a traditional setting, they discussed how they would have disclosed this. Of the students who disclosed their disability to their instructor some students discussed how they struggled with finishing tests that were timed online. When asked by the researcher what the instructor did to address the learning needs as a student with a documented disability, one participant, Sarah, a Business Administration major reported, “I don’t think either one knew.”

As demonstrated from the excerpt from the interview with this participant awareness of having to disclose to an online instructor resulted in the student not receiving the support from the instructor. When asked whether this was something that

they chose not to disclose, the student responded by stating that they assumed the instructor would know, but then found out that they would have to inform them.

Another student discussed the following:

By then I hadn't been diagnosed with a learning disability, so therefore he didn't know. But I did ask him some questions like I needed some clarity, and personally I didn't like how he would respond, it was kind of like this, like if you just read-if you just read, it's there. It wasn't helpful to me.

(Diana)

Summary

The table below displays a reference of the emergent themes from the analysis of research question one along with a few quotes that were chosen to highlight each theme.

Table 4.4: Summary of Research Question 1 Analysis

Themes	Quotes
Flexibility and Pace	“First of all what I did like about online classes is the flexibility. You can almost pace yourself, as far as learning the material...”(Michael)
Instructor Feedback, Responsiveness and Engagement	“First of all what I did like about online classes is the flexibility. You can almost pace yourself, as far as learning the material...”(Michael)
Subtheme Disclosure of Disability	“I just assumed that they would know. I just found out that I'm supposed to inform them.” (Sarah)

Research Question 2

The second research question was, “What are the experiences of college students with disabilities enrolled in online courses in regards to using assistive technologies and mobile media devices?” The goal of this research question was to explore the experiences of students with disabilities in online courses and whether students used assistive technologies or mobile media devices to support their learning. Two primary themes and

two sub themes emerged from the data analysis. The primary themes were as follows: 1) Students from the face-to-face interviews most often used mobile media devices, such as their smartphone, or tablets to access academic information; 2) Results from the quantitative analysis revealed no statistically significant differences in the perceptions of student support offered in face-to-face versus online classes. The first subtheme that emerged was that students with disabilities may have difficulties in an online course, especially when accessing accommodations such as extra time on tests, or not utilizing or accessing the necessary assistive technologies on time.

And lastly, another subtheme that emerged and was discussed in research question one was that students with a diagnosed disability taking an online course were sometimes not even aware of what assistive technologies were and how they could use them in the online environment.

Results: Research Question Two

The qualitative results are directly aligned with the research from the literature and with the fact that, as ownership of mobile media or devices increases, learners are able to engage in activities motivated by their personal needs and conditions of use, including the needs arising from better mobility and travel (Kukulska-Hulme, Traxler & Pettit, 2007; Pettit & Kukulska-Hulme, 2007; Kukulska-Hulme, 2008). The use of technologies such as mobile media has been aligned to support educational goals such as improving achievement, differentiation of the learner's needs, student retention, and providing access to learners who otherwise would not have the chance to participate in education (Kukulska-Hulme et al., 2005; Kukulska-Hulme, 2009).

A theme from the qualitative data analysis was that students (n=6) from the interviews most often used mobile media devices, such as their smartphone, or tablets to access academic information:

I use it in a situation which I need to take a test before a deadline and I use it for reference and finding out dates, scheduling, times for tests, easy access information, codes, things of those nature. Things like I don't want to walk to the library for or go all the way home for.

(Tom)

Another student (Mary) discussed how she uses mobile media on a daily basis and described using it for the following purpose:

I've had to quite often because I store notes in them and they have applications that make studying a lot easier.

Another student (Michael) discussed using a smart phone to access academic work.

I use my phone to access blackboard on a daily basis. A lot of times to check if assignments have been posted by the dates promised or to review some learning objectives that, you know, I might need to study for an exam, etc. etc.

This dissertation considers the framework of Matching Person and Technology Model (MPT) proposed by Scherer (1992), which considers the environment and social context of varying situations in which a device can be used, such as the user's interest, needs, capabilities, goals and expectations and the functional limitations of the technology itself. The MPT is a collaborative process that allows educators and students to make informed decisions about using assistive technologies (Scherer & Mckee, 1992).

The second primary theme that emerged from the quantitative analysis found that there were no statistically significant differences in the perceptions of student support offered in face-to-face versus online classes. The Survey scale asked respondents to

strongly agree, strongly disagree, or neither agree or disagree regarding whether they felt generally supported in their disability with face to face classes and with online classes.

Perceived Student Support

In order to assess whether there was a difference in students' perceptions of the levels of support offered to them in face-to-face versus online courses, they were asked to rate the level of support they typically receive in each class format on a 6-point scale. A paired samples t-test revealed no statistically differences in the perceptions of student support offered in face-to-face ($M = 4.15$ [SD = 1.44]) versus online classes ($M = 3.81$ [SD = 1.42]; $t_{(31)} = 1.32, p = .20$). Examination of these data with a post hoc power analysis revealed that the test had a power of .37 and that a sample of at least 113 subjects would have been required to conduct the test with a power level of .80.

Support Services Used

To assess the utilization of student support services at California College, respondents were asked to indicate which of 6 support services they had used in the past (Table 4.5). Quantitative analysis of data from the online survey provides information on whether students used the assistive technologies and other accommodations available to them as students registered with the campus disability office.

Table 4.5: Student Support Services Utilized

Support Service	Descriptive Statistics ^a
JAWS (Job Access with Speech)	0 (0.0%)
Screen Reader (text-to-speech)	1 (2.3%)
Zoom Text Magnifier	2 (4.7%)
Closed Captioning of Videos	1 (2.3%)
Converted Textbooks to Digital File	6 (14.0%)
Kurzweil 3000	7 (16.3%)

^a presented as n (valid percent)

Results indicated that students utilized Kurzweil most of the time for support, utilized services to convert textbooks to digital file second most often, and utilized other assistive technologies less often. It can be suggested that the type of disability a student is diagnosed with would play a part in the type of assistive technologies they utilized, while another factor could be their awareness of these types of resources on the campus. And from the data analysis of this study, the three most common types of disability were Attention Deficit Disorder (34.9%), Learning Disability (32.6%) and Psychological Disorders (27.9%).

Subthemes

The first subtheme theme that emerged from the qualitative data analysis was that students with disabilities may have difficulties in an online course, especially when accessing accommodations such as extra time on tests or not utilizing or accessing the necessary assistive technologies on time. This subtheme supports findings from the literature review that, for students with disabilities, the idea that online distance learning represents a transition of higher education being available to everyone, anytime and anywhere is not quite accurate (Schmetzke, 2001), but, instead, can experience a second digital divide (Burghstahler, 2003) where they are outperformed in the online environment without the access to necessary accommodations and assistive technologies (Bernard-Brak & Sulak, 2010) they need. For example, Michael, an interview participant and Biochemistry major, talked about his experience taking an online course and trying to use an accommodation by actually trying to take the test at the on campus disabilities office, but the instructor did not present the test to the testing center at the designated time and the student was left feeling anxious and frustrated:

I definitely have had instructors that have been very supportive in the learning process for a disabled individual, a disabled student with a documentation, yet I've also had a couple classes, a couple courses where the instructors are fully aware of the student, my situation, and they have been through semester after semester of working with campus disability office, yet they will wait until the very last minute to turn in test materials to the proctoring staff and that can be very interruptive, not only to the operations to the disability office but to the student, him or herself as well, because I'm expecting to take an exam at a certain time yet if the exam is not there it means that I may not be allowed the additional time that I'm supposed to get or even if I am I wouldn't be able to utilize the additional time because after this particular test time I have another class to go to.

The second sub theme that emerged from the qualitative analysis results and was discussed previously in Research Question One results, indicated that students with a diagnosed disability taking an online course were sometimes (4 out of 9 students did not use assistive technologies during their online course or courses) not even aware of what assistive technologies were and how they could use them in the online environment.

Research Question Three

The third research question asked, "How does taking online courses affect students self- efficacy?" The goal of this research question was to explore the relationship between students' self-efficacy (through the use of a survey and the face-to-face interview questions) and performance in the online course. The major theme that emerged from the study was aligned with the literature review on self-efficacy and computer self-efficacy in that experience with computers and technology will likely influence levels of computer self-efficacy and also that self-efficacy beliefs have been shown to influence academic achievement (Cassidy and Eachus, 2002).

Results: Research Question Three

The quantitative and qualitative data analysis confirmed the finding from the literature review that students with high self-efficacy can persist in the face of challenges

or adversities, and that they tend to achieve more (Pajares, 2006). Data from surveys and interviews were used as sources of triangulation.

Qualitative Results

For the qualitative data, semi-structured interviews and open-ended questions were used to collect data on self-efficacy of students. For example, when students were asked how they believed they would perform in the course, 6 out of 9 students thought they would do well going into the course while more than 50% of the sample were able to meet their expectations for the course with either a grade of A or B. The qualitative interview results showed that 22% did better than they expected, while 22% were unable to meet their own expectations. When asked if students were able to meet their own expectations for the course, Interview participant 5 discussed how he was able to meet his own expectations for the course and how it also improved his motivation by stating the following:

Definitely, it met my expectations and it gave me – since I was so –I felt so – what’s the word? – unmotivated. I felt so unmotivated because I thought I was doing something wrong in school. I thought there was something wrong with me and my learning abilities. I thought that I’m not as smart as I actually am because I was doing so well when I was a child and something just happened. When I took the online course, it gave me a feeling like I have more control and I can accomplish my – like I can come and go as long as I want. It gave me – it made me realize that – re-realize that I’m a lot smarter than I actually – I felt like I was in courses that I’d take in the classroom.

The following excerpt from the interview with Gilbert, discussed the student’s response to what his expectations were for the course and how he believed this may have influenced his level of motivation and performance in the course. The student discussed the following:

I had no expectations. I didn't know but I started doing good and it made me excel, it made me want to do good.

I started turning in my assignments in Music Composition and Theory and I was getting good grades. I was able to practice on the keyboard. I was able to practice on the guitar or whatever and practice the assignments that she gave us in the text that we had to turn in to her. So, the more assignments I did the, the more confidence I had. And that's probably what gives me my confidence in all my courses now is the fact that the assignments and my practicing, you know, how it gave me confidence.

When asked about important learning events that occurred during the course to influence their level of motivation and performance, the two most common responses indicated that 1) interest in course topic influence motivation, and 2) flexibility that online courses offered by allowing students to be able to refer back to course material and read over key concepts on their own time, kept them motivated and on task. For example, one participant (Mary) stated, "I think that depends on personal interest. If I was sincerely interested in learning about history, I will learn it." Another student (Sarah) discussed the following on interest and flexibility of the online class:

I would say my goal was to, of course, try to achieve as high a grade as possible. And my second was to gain an understanding of the subject. And honestly, I did. I really enjoyed it. I would sometimes spend two hours a day reading the material and understanding the dates and trying to understand the timeline. Because it was in a private setting, I think I was a little bit more relaxed and able to focus more, versus being in a classroom. I almost feel sometimes in a classroom that some of the students have no interest. So it actually improved my interest, being alone because there wasn't anyone else.

Another participant, Sean, a Criminal Justice major, discussed how the online course reinforced the learning process and how he needed to get things done, which increased his motivation. Interview Participant, Tom, responded to the probing question of how his learning goals changed through course of the class by stating:

Much more interested in the course and I believe that sitting there and going over everything myself, being motivated to do it myself rather than sitting in a

classroom and listening to someone saying it and just spacing out and feeling like it's work, I feel more motivated to go out to learn about the – learn the concepts and I feel like it's more – I feel like it's a more active experience than the actual active classroom. Instead of passively learning it you actively do it yourself.

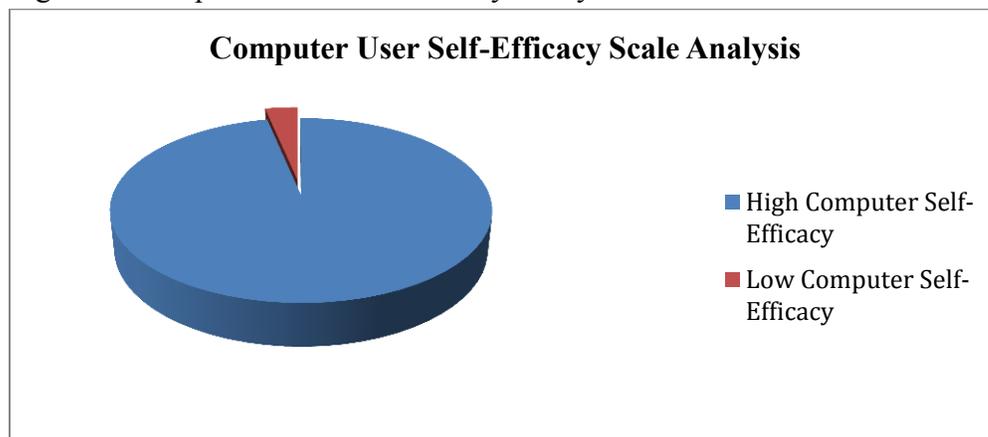
Quantitative Results

The results on the CUSE 1-6 point scale reported a mean score for computer self-efficacy to be 4.91 (SD = .78). Scores ranged from 1.72 to 5.90. The median was 5.05, and the mode was 5.10. The 30 respondents who provided full data on the self-efficacy scale items were classified into three groups based on their mean scores. One student had a mean score below 2 (3.3%) and was classified as having low computer self-efficacy; no students had moderate mean scores between 2.1 and 4.0 (0.0%), and the remaining 29 students had mean scores of 4.1 to 6.0 (96.7%), representing high computer self-efficacy. Tables 4.6 and Figure 1 display these findings as discussed above.

Table 4.6: Computer User Self Efficacy Scale Analysis (CUSE)

Mean Score	Percentage	Self-Efficacy Score
4.1 to 6.0	96.7	High Computer Self-Efficacy
2.1 to 4.0	0	Moderate Self Efficacy
2.0 and below	3.3	Low Self-Efficacy

Figure 1: Computer User Self-Efficacy Analysis



Conclusion

The study site, California College is a two year academic institution that prides itself on being at the forefront of technology and innovation. Students with disabilities have access to various support services on campus and through online education. This site was useful in collecting data to further explore the experiences of students with disabilities because of the access students have to resources both on campus in a traditional classroom setting and in the online educational environment. The primary themes indicate that while students' perceptions of support offered in face to face versus online course made no statistical difference, awareness of accommodations, and assistive technologies, instructor feedback, communication, engagement and organization were key factors in taking online courses to students.

Results indicated that students with disabilities liked the flexibility and pace of the online course, especially because it allowed them time to review academic content and key concepts at their own pace. The results also indicated, some of the interview participants did not disclose their disability to their online instructor for various reasons (for example, not knowing that they had to disclose, and/or choosing not to disclose

because they did not think it was necessary in an online course). Participants in this study overall seemed to use mobile media to access academic information readily and liked that this technology allowed them to obtain course information while on-the go or at their own convenience. The majority of students in this study reported high self-efficacy (as indicated by both qualitative and quantitative data) for using computers and for their beliefs in their own capabilities to successfully complete the online course. The results of this study indicated that students were most often able to meet their own grade and learning expectations in the online course.

Quantitative results indicated: 1) Respondents used assistive technologies such as Kurzweil, while very few respondents utilized closed caption of videos (2.3%), and screen reader (2.3%). Results indicated that none of the students utilized JAWS (Job Access With Speech) or Zoom Text Magnifier; 2) In assessing whether there was a difference in students' perceptions of the levels of support offered to them in face-to-face versus online courses, students rated the level of support they received on a 6-point scale. A paired sample t-test revealed no statistical differences in the perceptions of student support offered in online ($M = 3.81$ [$SD = 1.42$]; $t_{(31)} = 1.32$, $p = .20$) versus face-to-face ($M = 4.15$ [$SD = 1.44$]). A post hoc power analysis showed that the test had a power of .37 and that a sample of at least 113 subjects would have been required to conduct the test with a power level of .80; and finally 3) the results from the CUSE (Computer User Self-Efficacy Scale) 1-6 point scale reported a mean score of 4.91 ($SD = .78$) for computer self-efficacy. Scores ranged overall from 1.72 to 5.90; the median was 5.05, and the mode was 5.10. Out of the 30 respondents who provided full data on the self-efficacy scale itself, the researcher classified 3 groups based on respondents mean scores. The majority

(96.7%) of the respondents had means scores of 4.1 to 6.0 representing high computer self-efficacy; there were no respondents who had a moderate mean score between 2.1 and 4.0 (0%) and 3.3 % of respondents had a mean score below 2 which was classified as low self-efficacy.

CHAPTER 5: DISCUSSION

Introduction

Students with disabilities (SWDs) enrolled in higher educational institutions have steadily increased in numbers (Beilke & Yssel, 1999; Shevlin, Kenny, & McNeela, 2004; Barnard-Brak, Lechtenberger & Lan, 2010), with the amount of students self-identifying as a student with a disability quadrupling since 1978. The passage of the Americans with Disabilities Act (ADA) of 1990 extended antidiscrimination laws under Section 504 to include postsecondary institutions (Kosine, 2007), providing equal opportunities to individuals with disabilities and included the choice to pursue higher education (Myers & Bastian, 2010). Contrary from K-12 settings, in postsecondary education settings, students with disabilities are not only required to self-identify, but have to request accommodations in order to receive services ((Barnard-Brak & Sulak, 2010). With the passage of the Rehabilitation Act of 1973, Section 508 mandated that electronic information be accessible to all (Roberts & Crittenden, 2009). While the 1990 ADA legislation did not address web pages or the online environment, Section 508 of the Rehabilitation Act was amended in 1998 for accessibility standards in electron technology and information, which also included distance education ((Roberts & Crittenden, 2009). These laws were developed to provide accessibility in electron information to individuals with and without disabilities (Roberts & Crittenden, 2009).

With the integration of technology into the learning environment, the implications for students with disabilities in online or distance education courses in terms of accessing necessary support services can be daunting. Students may be outpaced in the online learning environment if they do not have access to necessary accommodations or

assistive technologies (Barnard-Brak, 2010). When online learning environments are universally designed, this can increase access for all.

Distance education can provide SWDs access to higher educational institutions, flexibility in location, delivery and scheduling courses (Moisey, 2004). The number of individuals using assistive technologies (AT) devices has increased dramatically (Scherer, 1996), and, as these technologies have become more affordable and portable, differences in individual users can be accommodated (Scherer, 1996). The process of matching a person with technology such as AT can be complex and can be attributed to an individual's needs, abilities, computer efficacy, and past experiences with using technology (Scherer, 1996).

Research involving SWDs and the support services they receive in online or distance educational settings has had slight attention, in comparison to studies involving SWDs in traditional classroom settings (Moisey, 2004).

The Purpose

The purpose of this study was to explore the experiences of college students with disabilities in taking distance education or online courses, to look at how the change in environment influenced their self-efficacy and how, or if, assistive technologies and mobile media devices were used to support their learning. The study attempted to generate new knowledge through exploration and mixed methods design. The study was conducted at a large two year college setting in Southern California, which serves mostly undergraduate students in an urban area with a student enrollment of approximately 7000-10,000 students and a student to instructor ratio of 20:1.

A further purpose of the study was to develop a rich understanding of the experiences of students with disabilities in online courses by utilizing a multifaceted comprehensive theoretical approach and framework. The study explored students' experiences through the lens of Bandura's social cognitive theory as the foundation of the study; Bandura's framework of triadic reciprocity (1986), which considers the personal-environmental and interaction factors; Scherer's (1992) Matching person with technology (MPT); and the principles of universal design. This comprehensive lens allowed the researcher to explore a deeper understanding of the needs of students with disabilities. This chapter will summarize the findings of the research study conducted and provide implications for future research and conclusion.

Research Questions

- 1) What are the experiences of College students with disabilities taking online or distance education courses?
- 2) What are the experiences of college students with disabilities enrolled in online courses in regards to using assistive technologies and mobile media devices?
- 3) How does taking online courses affect students self- efficacy?

Summary of the Findings

This study of students with disabilities taking online classes at California College (CC) provided the opportunity to further explore students' overall experiences through a multifaceted theoretical lens and allowed the researcher to investigate how self-efficacy (particularly computer efficacy), influenced students' motivation and performance, and whether/how students utilized assistive technologies and mobile media devices to access academic material. The research utilized a mixed methods study design through

qualitative interviewing and a survey to broaden the understanding of students with disabilities in online environments and to build on the results from the qualitative approach. Combining methods and using a multifaceted theoretical approach to better inform the study allowed for triangulation of the data.

The study looked at use of assistive technologies, use of mobile media, perceived support, computer self-efficacy, and self-efficacy of students with disabilities in online courses. Through analysis of the results, various themes emerged. The themes indicated that students' perceptions of support offered in face to face versus online courses made no statistical difference. However, students' awareness of accommodations, their use of assistive technologies, instructor feedback, communication, engagement and organization of the instructor were key factors in taking online courses.

The primary qualitative themes indicated that students liked the flexibility and pace of an online course, particularly because it allowed them time to review academic content and key concepts at their own pace; a good portion of the interview participants did not disclose their disability to their online instructor for reasons such as not knowing that they had to or not thinking it was necessary to disclose in the online course; participants used mobile media regularly to access academic material and liked that this technology was convenient by giving them quick access to course information; participants reported having high self-efficacy in their own beliefs and expectations to successfully complete the course; and they were most often able to meet their own grade and learning expectations in the online course.

Results from the quantitative analysis helped to broaden the understanding of the study and to connect students' computer self-efficacy with their beliefs in their own

ability to succeed in the online environment, and analyze their use of assistive technologies in terms of their perceived level of support in the online environment versus a traditional classroom environment.

Implications for Practice

This study explored students' experiences through a phenomenological approach by conducting in-depth interviews with students with disabilities at a two-year college setting to understand how they experienced the phenomenon of taking an online course. This study sought to further enrich the qualitative data by using quantitative design through the use of a survey to examine descriptive statistics and the self-efficacy of participants. The study also explored students with disabilities through the framework of Bandura's (1986) triadic reciprocity to connect their personal experiences, their environment and their interactions. It also used Scherer's (1992) Matching Person with technology to analyze their overall experience in the online course and found that this can be essential to better understanding the unique experiences of these students and how we can help them succeed. Additionally, computers and instructional technology have been found to have a positive impact on students with disabilities (Simoncelli & Hinson), and the evidence cited in this study supports the link between success in online environments and students self-efficacy (Spence & Usher, 2007).

The implications of this study are as follows:

- 1) Students and Instructors Awareness of Resources for Students with Disabilities
- 2) Study supports prior research that Universal Design Principles should be embedded in the course curriculum from the beginning.

- 3) The link between students' success in online courses and self-efficacy (Spence & Usher, 2007).
- 4) Increased Instructors engagement and active involvement with students.
 - a. Giving feedback in a timely manner
 - b. Engaging more frequently with students (via chats, discussions, email or face-to-face).
- 5) Training for Educational institutions on online accessibility and Universal Design Principles.
- 6) Training for online instructors regarding: policies/legislation, resources and accommodations.

Improvements in technology have created numerous opportunities for learning among students with disabilities by providing wider access to education, information, and learning (Li & Irby, 2008). However, from the results of the qualitative analysis of this study, a question to consider is whether students with disabilities are even aware of or are utilizing the resources, accommodations, and assistive technologies available to them when taking online classes, and how much their lack of awareness of these services can be linked to how a course is designed (for example, if it is universally designed), to the instructor's knowledge of these resources, and to the ways in which they communicate these resources to students. This study helps to support knowledge on the concept of Universal design and the term Universal Design for Learning (UDL) as it is described as information that is accessible to all students through a curriculum and supports the premise that a curriculum should have options for making learning accessible and

appropriate to students with diverse backgrounds, disabilities, learning styles and abilities (Simoncelli & Hinson, 2008).

A solution may be to have courses designed with the concept of universal design in mind where, for example, online course formatting could have links to accommodations available to students with a registered disability. There could be a direct link to contact information to access support services embedded in the course's website that leads not just to information on accessing Information Technology (IT) support or Help Desk support, but to information on getting access to different types of assistive technologies and how to use accommodations that are pertinent for online learners with disabilities. Results from this study indicated that students sometimes found themselves running out of time when taking online tests, and, while one student from the interview portion reported his instructor's accommodating the time he had to finish the exam, information on accessing this type of accommodation or on how instructors will assist students who have documented disabilities in online courses could be clearly presented or should be accessible for students from the time they enroll in the course.

The results discussed above are in support of the literature on UDL and the idea that, as UDL becomes more feasible and universal, assistive technologies will not have to be required any longer to make up for the shortcomings of the curriculum design itself (Simoncelli and Hinson, 2010). In addition, the results of this study also support the evidence-based research of McGuire, Scott and Shaw (2006), who conducted a study that examined universal instructional design principles and found that there was a significant relationship between the level of Universal Instructional Design (UID) in a course and students' self-efficacy.

As discussed in the literature review, social cognitive theory proposed that peoples' behaviors can be predicted most often by the beliefs they hold regarding their own capabilities, which is often referred to as self-efficacy (Pajares, 2003). According to Bandura and Locke (2003), efficacy beliefs contribute to the level of motivation and performance of individuals. The research data from this study also supports the link between self-efficacy and students' motivation and performance in the course. The results indicated that students who had high self-efficacy upon entering a course (including computer self-efficacy) and high expectations for completing the course were more likely to meet their own grade expectations for the course and successfully complete the course. Results from this study support the research cited in the literature review which found that individuals with learning disabilities (32.6 % of respondents from quantitative survey) are overly optimistic in rating their level of self-efficacy (Klassen, 2007). However, this optimism did not seem to hinder students' performance in the online environment. Contrary to the findings in this study, further evidence-based research suggests students who choose academic tasks that greatly exceed their level of skill may experience failures and debilitating efficacy beliefs (Schunk, Pintrich & Meece, 2008). Evidence cited in this study supports the importance of the link between success in online environments and a students' self-efficacy to manage their learning environment and, ultimately, succeed (Spence & Usher, 2007). The results of this study also help to extend the literature and fill the gap in research by examining the relationship between self-efficacy and student success online.

Evidence from the study also supports the need for instructors of online courses to be actively involved and in regular or consistent communication with their students.

Actively involved, in the case of this study, refers to instructor responsiveness to student emails and questions, instructor feedback on assignments or tasks assigned, and instructor knowledge and support of students with disabilities and making sure there are courses aligned with and which meet accessibility standards and ADA legislation. This support that students desire from their instructors, as indicated by the results of this study, is best understood through the framework of Bandura's triadic reciprocity where human functioning can be explained in terms of behavior, cognitive and personal factors, and environmental events which all operate as determinants of one another (Bandura, 1986). Comprehensive training for educational institutions on online accessibility and how to proactively ensure that learners are benefiting (Roberts and Crittenden, 2009) as well as training for online instructors is a suggestion for improving access and communication issues. Evidence from this study supports the concept of Universal Design for learning where online instructors should try to make their course materials accessible to everyone rather than the individual needs of students (Simonecelli & Hinson, 2010)

Evidence from this study also supports the need for training or professional development programs on Universal Design Principles, and online accessibility to educational institutions; as well as training for online instructors on these policies, resources and accommodations.

Limitations

There were several limitations that emerged through conducting this study that should be addressed in future studies on students with disabilities in online academic classes. The limitations included survey response rate, time frame of study and

generalizability. These are discussed below with recommendations for future studies to address these limitations.

Survey Response Rate

One limitation to this study was the sample size for the survey. There were 48 respondents, but 6 surveys were omitted because these students did not complete the consent form prior to beginning the survey. Also, the survey was sent out via email to 462 students. The site staff approximated that 120 students met the criteria for the study. As discussed above, only 42 respondents' data from the survey were analyzed, which equates to a 35% response rate. Students may not have responded for various reasons such as type of disability, access to a computer to complete the survey, may not have read the email advertising the study, lack of interest or time to participate, and may have thought they would not qualify or meet the criteria for the study.

Time Frame

Another limitation was the time frame of the study, which was limited to the fall semester at the study site. Perhaps with a longer time frame for the study, there may have been a greater response rate from students and the researcher would have been able to develop further insights from the study. Future suggestions would be to extend the time frame of the study to see if this makes a difference in survey response rate or findings in general.

Generalizability

A final limitation was only one site was chosen for participation in this study, and, as a result, the findings are not generalizable. The sample relied on the data from California College alone and is not generalizable to four-year institutions. However, it

could be generalizable to other two-year, urban college institutions. Future studies could examine students with disabilities in two year and four year colleges and institutions.

Recommendations for Future Research

Future research can focus on the type of assistive technologies student use, their awareness of the accommodations, and faculty perceptions of students with disabilities taking online courses and their knowledge of the resources available to these students. Future research can also include examining how students with disabilities access assistive technologies and accommodations in their online course and what can be done to improve awareness of these resources and the accessing of this information in real time. Future research in regards to self-efficacy and online learners with disabilities can look at disability type and whether specific disabilities predict differences in self-efficacy or whether specific accommodations used in the past predict differences in self-efficacy.

Conclusion

As the population of postsecondary education students is steadily increasing, so are the numbers of students who are enrolling in online education (Sener, 2010). Online education has been growing a rate 10 times the rate of higher education, drawing support for more attention, energy and resources towards this area (Sener, 2010). Additionally, postsecondary students with disabilities completed their degrees about 54% of the time, compared to 64% of their non-disabled peers within six years of enrollment (US Department of Education, 2000; Simoncelli & Hinson, 2010). The increased presence of students with disabilities in postsecondary education, while encouraging, also indicates the importance of better designing higher education curriculum and supports the literature

on the need for higher education institutions to implement comprehensive training (Roberts & Crittenden, 200) to proactively meet the needs of learners.

This study sought to explore the experiences of students with disabilities in an online academic environment. It also sought to explore students' self-efficacy and their use of assistive technology and mobile media to support their learning. The results of this study indicated that students with disabilities are motivated and have a high self-efficacy to succeed, are using assistive technologies (when aware of them) and would use them in their courses to support their learning, would like to have instructors more involved and responsive in the online environment, and are accessing technology such as mobile media for educational purposes. The implications of this study indicate the need for instructor engagement and feedback, the need for professional development to online instructors, and educational institutions, and perhaps an online tutorial and discussion forum for students to engage with instructors in online courses. The implications of this study also indicate that, when curriculum is not designed through the lens of Universal design, where access to accommodations and resources are embedded in the course itself, it can lead to students with disabilities feeling unsupported by their educational institutions and overwhelmed in their academic course work, decreasing motivation and performance.

As meeting the needs of individuals with disabilities continues to grow in importance, so does the need for accessible distance education courses (Roberts & Crittenden, 2009) as well as comprehensive training of higher educational institutions on how to best support the needs of these learners in an equitable way. It is the hope of this study to have been able to contribute to the small body of research on students with disabilities in an online environment, thus extending the literature on this topic.

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APPENDIX A

USC Institutional Review Board Approval Document

UNIVERSITY OF SOUTHERN CALIFORNIA
UNIVERSITY PARK INSTITUTIONAL REVIEW BOARD
FWA 00007099
Exempt Review

Date: Sep 09, 2011

Principal Investigator: [Chandinie Francis](#)

Faculty Advisor: [Patricia Tobey](#)

Co-Investigators:

Project Title: [Students with Disabilities in higher education online courses](#)
USC UPIRB # UP-11-00339

The iStar application and attachments were reviewed by UPIRB staff on **9/9/2011**.

The project was APPROVED.

Based on the information provided for review, this study meets the requirements outlined in 45 CFR 46.101(b)(1, 2) and qualifies for exemption from IRB review. The study is not subject to further IRB review. IRB exemption of this study was granted on **9/9/2011**.

Because you plan to implement an online survey, please remember to present the information sheet along with the recruitment e-mail **or** at the beginning of the survey (prior to asking any questions).

To access IRB-approved documents, click on the “Approved Documents” link in the study workspace. These are also available under the “Documents” tab.

Researchers are reminded that some site/schools require permission to conduct research even if the research is exempt from IRB review.

Sincerely,

Ryan M. Brooks, M.A. Psy., IRB Administrator

APPENDIX B

Recruitment Email

Dear [Name],

My name is Chandinie Francis and I am a doctoral student in the Rossier School of Education at USC. I am conducting a research study as part of my dissertation, focusing on the experiences of students with disabilities in online courses. You have been identified as someone who is involved with the Disability Services office, and as someone who might be ideal for the study. Participation would require one interview of up to 1 hour.

Participation in this study is entirely voluntary. Your identity as a participant will remain confidential at all times during and after the study and all interviews will take place in a private office on campus. Your relationship with the Disability Services office at your school will not be affected whether or not you participate in this study.

If you have questions or would like to participate, please contact me at.

Thank you for your participation.

University of Southern California

APPENDIX C

Criteria

- 1) Participants are college students that are registered with the college campus Disabilities Services Office. They will have a verified documented disability.
- 2) Participants will have taken an academic online course through the college or university.
- 3) Participants must be 18 years or older and must speak English fluently.

APPENDIX D

Informed Consent Form (Interviews)

Thank you for agreeing to participate in this study, which will take place from September 2011 to December 2011. This form details the purpose of this study, a description of the involvement required and your rights as a participant.

The purpose of this study is:

- To gain insight into the experience of students with disabilities in online courses.

The benefits of the research will be:

- To better understand students experiences in an online environment
- To identify significant components that could help in development of services for students with disabilities.

The methods that will be used to meet this purpose include:

- Face to Face interviews that will last up to 1 hour in length
- Tape-recorded interviews

You are encouraged to ask questions or raise concerns at any time about the nature of the study or the methods I am using. Please contact me at any time at the e-mail address listed above.

Our discussion will be audio taped to help me accurately capture your insights in your own words. The audiotapes will only be heard by the researcher (myself) for the purpose of this study. You have the right to withdraw from the study at any time. In the event you choose to withdraw from the study all information you provide (including tapes) will be destroyed.

Information gathered by you and other participants will be used in analyzing and

documenting qualitative research, which will be read by my committee chair and my two additional committee members. Though direct quotes from you may be used in the paper, your name and other identifying information will be kept anonymous.

By signing this consent form I certify that I _____ (Print name) **agree** to the terms of this agreement.

(Signature) (Date)

Witness Signature (Date)

APPENDIX E

Interview Protocol Form

Student Interview Protocol

Institution:

Interviewee (Title and Name):

Interviewer:

Other Topics Discussed:

Documents Obtained:

Post Interview Comments or Leads:

Interviews

Introductory Protocol

To facilitate our note taking, we would like to audio tape our conversations today. Please sign the release form. For your information, only researchers on the project will be privy to the tapes that will be eventually destroyed after they are transcribed. In addition, you must sign a form devised to meet our human subject requirements. Essentially, this document states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) we do not intend to inflict any harm. Thank you for your agreeing to participate.

We have planned this interview to last no longer than one hour. During this time, we have several questions that we would like to cover. If time begins

to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning.

Introduction

You have been selected to speak with us today because you have been identified as someone who has a great deal to share about your experience with online courses. Our research project as a whole focuses on getting an in depth understanding of your experience as a student with a documented disability taking an online course, with particular interest in understanding how students with disabilities are engaged in these types of courses, and whether we can begin to share what we know about making a difference in online education. Our study aims to learn more about your academic online experience and hopefully help us to learn about practices that can help improve student learning in online environments.

A. Interviewee Background

How long have you been ...

_____ at this institution?

Interesting background information on interviewee:

What is your highest degree?

What is your field of study?

1. What has your experience been with online courses?
Probe: Can you give examples of circumstances or situations you liked?
Probe: Can you give examples of circumstances you disliked?
2. What experiences do you have with using computers and taking online courses?
Probe: Would you say you're confident in your ability to use computers? Describe your experience or elaborate?
3. Where and what was your first online academic course?
Probe: Can you describe your experience?
4. What were your early childhood influences in using computers?

5. What are your experiences with using assistive technologies?
6. How often do you use mobile media (Smartphone, tablet, iPod, iPad) to access academic work?
7. How would you describe your experience with regards to accessing academic information in your online course?
8. What has your instructor done to address your learning needs as a student with a documented disability?
Probe: Can you give me an example of what was helpful about it?
9. How do you believe you will perform in your online courses?
10. What were your expectations for the course? (Specifically with regard to your own beliefs about your ability to successfully complete the course).
Probe: How would you describe your own beliefs about your ability to successfully complete the course?
11. What were your initial learning goals for the online course (s)?
Probe: How has this changed after taking the course(s)?
12. Describe examples of important learning events during the course that may have influenced your level of motivation and performance.
13. What did you expect your final grade for the class to be?
Probe: Describe whether you were able to meet your own expectations for the course or your experiences in being able to meet your expectations.
14. How would your needs in the course be better supported?
Probe: How could your Professor/Instructor have better met your learning needs?
Probe: How could the format of the online course been better designed to meet your needs?
15. How would you describe your level of competence in troubleshooting or problem solving now that you've taken the course?
Probe: What were your experiences with accessing support from the online support/help desk? How would you describe your confidence level in accessing support from the online support/help desk?
16. How would you describe your interactions with peers in the online course?
17. What were your experiences with communicating with your peers/classmates?

Probe: How often did you communicate with peers through online discussions, mobile media, or chats?

F. Demographics

Post Interview Comments and/or Observations:

APPENDIX F

Interview/Research Questions Comparison Form

Research Question # 1 Experience/Use of Technology
What are the experiences of college students with disabilities in online courses?
A. What are the experiences of college students with disabilities in using assistive technologies in online courses?
Interview Questions
What has your experience been with online courses?
Probe: Can you give examples of circumstances or situations you liked?
Probe: Can you give examples of circumstances you disliked?
What experiences do you have with using computers and taking online courses?
Probe: Would you say you're confident in your ability to use computers? Describe your experience or elaborate?
Where and what was your first online academic course?
Probe: Can you describe your experience?
What were your early childhood influences in using computers?
What are your experiences with using assistive technologies?
How often do you use mobile media (Smartphone, tablet, iPod, iPad) to access academic work?
How would you describe your experience with regards to accessing academic information in your online course?
What has your instructor done to address your learning needs as a student with a documented disability?
Probe: Can you give me an example of what was helpful about it?
Research Question # 2 Self-Efficacy
How does taking online courses affect students self-efficacy?
Interview Questions
What were your expectations for the course? (Specifically with regard to your own beliefs about your ability to successfully complete the course).
Probe: How would you describe your own beliefs about your ability to successfully complete the course?

APPENDIX G

Survey Questions

(Including the Computer User Self-Efficacy Scale, Cassidy and Eachus, 2002)

Please indicate your race/ethnicity:

- White, non-Hispanic
- Hispanic or Latino
- Black
- Hawaiian or Pacific Islander
- Asian
- Other (Please Clarify)

What is your age (please only type numbers in the field below):

Please indicate your current standing in school

- Freshman
- Sophomore
- Junior
- Senior

Have you ever taken an on-line course at Irvine Valley College

- Yes
- No

Below you will find a number of statements concerning how you might feel about computers. Please indicate the strength of your agreement/disagreement with the statements using the 6-point scale shown below. Click the box (i.e., between 1 and 6) that most closely represents how much you agree or disagree with the statement. There are no correct responses, it is your own views that are important.

Below you will find a number of statements concerning how you might feel about computers. Please indicate the strength of your agreement/disagreement with the statements using the 6-point scale shown below. Click the box (i.e., between 1 and 6) that most closely represents how much you agree or disagree with the statement. There are no correct responses, it is your own views that are important.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
Most difficulties I encounter when using computers, I can usually deal with.	<input type="radio"/>					
I find working with computers very easy.	<input type="radio"/>					
I am very unsure of my abilities to use computers.	<input type="radio"/>					
I seem to have difficulties with most of the computer programs I have tried to use	<input type="radio"/>					
Computers frighten me	<input type="radio"/>					
I enjoy working with computers	<input type="radio"/>					
I find that computers get in the way of learning	<input type="radio"/>					
Computers make me much more productive	<input type="radio"/>					
I often have difficulties when trying to learn how to use a new computer program	<input type="radio"/>					
Most of the computer programs I have had experience with, have been easy to use	<input type="radio"/>					
I am very confident in my abilities to make use of computers	<input type="radio"/>					
I find it difficult to get computers to do what I want them to.	<input type="radio"/>					
At times I find working with computers very confusing	<input type="radio"/>					

Below you will find a number of statements concerning how you might feel about computers. Please indicate the strength of your agreement/disagreement with the statements using the 6-point scale shown below. Click the box (i.e., between 1 and 6) that most closely represents how much you agree or disagree with the statement. There are no correct responses, it is your own views that are important.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
I would rather that we did not have to learn how to use computers	<input type="radio"/>					
I usually find it easy to learn how to use a new software package	<input type="radio"/>					
I seem to waste a lot of time struggling with computers	<input type="radio"/>					
Using computers makes learning more interesting	<input type="radio"/>					
I always seem to have problems when trying to use computers	<input type="radio"/>					
Some computer programs definitely make learning easier	<input type="radio"/>					
Technical computer terms confuse me	<input type="radio"/>					
Computers are far too complicated for me	<input type="radio"/>					
Using computers is something I rarely enjoy	<input type="radio"/>					
Computers are good aids to learning	<input type="radio"/>					
Sometimes, when using a computer, things seem to happen and I don't know why	<input type="radio"/>					
As far as computers go, I don't consider myself to be very competent.	<input type="radio"/>					
Computers help me to save a lot of time	<input type="radio"/>					
I find working with	<input type="radio"/>					

Below you will find a number of statements concerning how you might feel about computers. Please indicate the strength of your agreement/disagreement with the statements using the 6-point scale shown below. Click the box (i.e., between 1 and 6) that most closely represents how much you agree or disagree with the statement. There are no correct responses, it is your own views that are important.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
computers very frustrating						
I consider myself to be a skilled computer user	<input type="radio"/>					
When using computers I worry that I might press the wrong button and damage it	<input type="radio"/>					

Please indicate how much you agree with the following two statements
Please indicate how much you agree with the following two statements

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
In my face-to-face classes I have felt generally supported in my disability	<input type="radio"/>					
In my on-line classes I have felt generally supported in my disability	<input type="radio"/>					

To better understand your academic experience and provide context to your answers, it would help me to know which disabilities apply to you (check all that apply):

- Deafness/Hearing Impairment
- Speech Impairment
- Learning Disability
- Attention Deficit Disorder
- Psychological Disorder
- Blindness/Visual Impairment
- Mobility/Orthopedic Impairment
- Other Health Impairment

Which of the follow student support services have you ever made use of in your on-line courses (check all that apply):

- JAWS (Job Access With Speech)
- Screen Reader (text-to-speech)
- Zoom Text Magnifier
- Closed Captioning of videos
- Converted Textbooks to a Digital File
- Kurzweil 3000

APPENDIX H

Table 1

Table 1: Survey Results: Year of Study at Study Site and Most Common Disability Type

Year at College	%	Type of Disability	%
First Year	15.8	ADHD	34.9
Second Year	44.7	Learning Disability	32.6
Third Year	23	Psychological	27.9
Fourth Year	15.8	Other	20.9*

APPENDIX I

Table 2

Table 2: Demographic Characteristics of Sample Students

Demographic	Descriptive Statistics ^a
n	42
Age	29.62 (11.45)
Race	
Asian	9 (22.5%)
Black or African American	2 (5.0%)
Hispanic or Latino	7 (17.5%)
Middle Eastern	1 (2.5%)
White, Non-Hispanic	19 (47.5%)
Multi-ethnic	2 (5%)
Grade Level	
Freshman	6 (15.8%)
Sophomore	17 (44.7%)
Junior	9 (23.7%)
Senior	6 (15.8%)
Disability	
Deafness/Hearing Impairment	0 (0.0%)
Speech Impairment	2 (4.7%)
Learning Disability	14 (32.6%)
Attention Deficit Disorder	15 (34.9%)
Psychological Disorder	12 (27.9%)
Blindness/Visual Impairment	1 (2.3%)
Mobility/Orthopedic Impairment	6 (14.0%)
Other	9 (20.9%)

^a presented as n (valid percent) or mean (SD) where appropriate

- The “other” category for disabilities included:
 - Anxiety: 1
 - Brain Injury: 2
 - Fibromyalgia: 1
 - Hand & Wrist Dysfunction: 1
 - Multiple Sclerosis: 1
 - Uncontrolled HBP: 1

APPENDIX J

Table 3

Table 3 Pseudonyms for Interview Participants

Interviews Conducted	Pseudonyms Assigned	Major
Interview 1	Sean	Criminal Justice
Interview 2	Gilbert	Computer Science
Interview 3	Carrie	Digital Media Arts
Interview 4	Mary	Psychology/Social Behavior
Interview 5	Tom	Biological Sciences
Interview 6	Ben	Psychology
Interview 7	Sarah	Business Administration
Interview 8	Michael	Biochemistry
Interview 9	Diana	Psychology

APPENDIX K

Table 4

Table 4: Summary of Research Question 1 Analysis

Themes	Quotes
Flexibility and Pace	“First of all what I did like about online classes is the flexibility. You can almost pace yourself, as far as learning the material...”(Michael)
Instructor Feedback, Responsiveness and Engagement	“First of all what I did like about online classes is the flexibility. You can almost pace yourself, as far as learning the material...”(Michael)
Subtheme Disclosure of Disability	“I just assumed that they would know. I just found out that I’m supposed to inform them.” (Sarah)

APPENDIX L

Table 5

Table 5: Student Support Services Utilized

Support Service	Descriptive Statistics ^a
JAWS (Job Access with Speech)	0 (0.0%)
Screen Reader (text-to-speech)	1 (2.3%)
Zoom Text Magnifier	2 (4.7%)
Closed Captioning of Videos	1 (2.3%)
Converted Textbooks to Digital File	6 (14.0%)
Kurzweil 3000	7 (16.3%)

^a presented as n (valid percent)

APPENDIX M

Table 6

Table 6: Computer User Self Efficacy Scale Analysis (CUSE)

Mean Score	Percentage	Self-Efficacy Score
4.1 to 6.0	96.7	High Computer Self-Efficacy
2.1 to 4.0	0	Moderate Self Efficacy
2.0 and below	3.3	Low Self-Efficacy

APPENDIX N

Figure 1

Figure 1: Computer User Self-Efficacy Scale

