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Pepperdine University
Graduate School of Education and Psychology

HOW CALIFORNIA COMMUNITY COLLEGE STUDENTS WITH LEARNING
DISABILITIES ACQUIRE METACOGNITION: A PHENOMENOLOGICAL APPROACH

A dissertation submitted in partial satisfaction
of the requirements for the degree of
Doctor of Education in Learning Technologies

by

Amar Isa Abbott

July, 2018

Linda Polin, Ph.D. – Dissertation Chairperson

This dissertation, written by

Amar Isa Abbott

Under the guidance of a Faculty Committee and approved by its members, has been submitted to and accepted by the Graduate Faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

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DEDICATION

I dedicate this dissertation:

In memory of my father, Ernest Lee Abbott, who made me a strong Black man and taught me education is the great equalizer. Dad, you will always be my hero.

I love you and miss you.

To my mother, Curlie Jean Abbott, who always cared for me with her passionate and kind heart.

I love you, mom, and I am proud to be your son!

To Jennifer Barra, who has the kindest and warmest heart I have ever known. This dissertation would not have been possible without your sacrifice and love.

I love you with all my heart and I always will.

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I would like to acknowledge and thank the following people for my success in completing this doctoral program. To all my Abbott brothers and sisters who have made life extremely enjoyable over the years, I love you all. A special thanks to Frank and Sharon Stevens for opening up their home when I needed to be closer to campus as I completed my studies.

A tremendous thank you to my dissertation committee, a team which gave me needed guidance and insight throughout this process. Judi Fusco, you always had great advice and somehow you always gave it to me at the right time. Your passion for your work is unrivaled and I appreciate your believing in me from day one. Windy Franklin, you have been my colleague, my mentor, and most importantly, my friend. I would not still be in academia if you had not shown me the proper etiquette and emotional intelligence needed to successfully navigate the landscape of the post-secondary environment. I love you and thank you. Linda Polin, the most magnificent committee chair a man could ever ask for. At times, your words were harsh but they were always needed. You supported me through a complicated process and whenever it was time for you to stand up for me, you delivered with flying colors. Thank you, wire mother, you will always be in my heart.

Kip Glazier, you adopted me at Tech camp and for some reason you believed in me from the start. I am honored to call you my friend and colleague. I appreciate how you always take the time to answer any one of my crazy questions about the program or one of life's mysteries. Thank you.

To my Taft College family, thank you for welcoming me to our fantastic institution. A special thanks goes to the DSPS department of which I am proud to be a member. We do tremendous work with our students. A special thank you to Sharyn Eveland and Janis

Mendenhall, who without hesitation or reservation willingly went out of their way to help me with my dissertation.

To all my friends at Napa Valley College, thank you for your support over the years. I like to give a special thanks to Rick Foley and Gurpreet Singh who helped me with special printing projects. Also, Chris Farmer, who helped me with statistics; I am convinced I never would have passed the class without his help. Thank you.

Finally, to Cadre 20, I remain a proud member of what is one of the best cadres that ever passed through the GSEP division. Thank you all for going on this journey of erudition. Also, a gratifying thank you to my learning partners Honora, Pati, and Steve. Honora, you taught me that if you are always being a professional, people will treat you as such. Thank you. Pati, your thirst for knowledge is unquenchable and I remain in awe of you every day. Thank you for always having my back, at both the museum and in class. Steve, I cannot imagine doing this program without you. Thank you, brother.

VITA

RELEVANT QUALIFICATIONS:

- Experience developing and coordinating faculty and staff flex training including one-on-one instructional design consultation.
- Extensive knowledge of web-based content management systems, online learning repositories, open source technologies, and web-based conferencing systems.
- Ability to gather, analyze, and maintain data required to evaluate program effectiveness.
- Actively collaborate with faculty, staff, and administration on college committees.
- Knowledge of laws regarding accessibility, technical requirements, usability standards, and federal and state mandates to ensure that digital media technology supports universal learning.

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- Serve as a liaison between faculty, students, and the Student Support Services program to secure and translate instructionally related materials into alternate forms.
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ABSTRACT

This phenomenological study examined the experiences of students with learning disabilities (LD) in acquiring the metacognitive skills necessary for success in California community college. Within 8 years of high school graduation, over 67% of young adults with LD will enroll in post-secondary education, many choosing a community college. The rate of community college completion for adults with LD, however, is nearly 10% lower than the general population (National Center for Learning Disabilities, 2014). Metacognitive skills have been shown to contribute to the success of LD students in college.

To identify college-level students who have acquired metacognitive ability, the researcher employed the Metacognition Awareness Inventory (MAI). Five students who scored at least 70% on this instrument were interviewed using a semi-structured interview protocol. Analysis of the interview data was conducted using the a priori codes that emerged from the review of literature.

The study revealed that the research participant's used a variety of metacognitive skills and strategies to accomplish their individual and academic goals. The three major strategies that LD students used to learn metacognition were a) formal learning, b) informal learning, and c) adaptation over time. Given California's community college system being the largest system of postsecondary education in the world and the number of students with LD who are enrolled in the system, the results of this study could affect the way community colleges educate thousands of students with disabilities.

Chapter One: Focus and Significance

Over the last 40 years, there have been significant changes in the civil rights for people with disabilities (PWDs), particularly in the realm of educational access. According to Martin, Martin, and Terman (1996), throughout history people with disabilities have often been marginalized and discriminated against leading “to isolation, exclusion, and the destruction of people disabilities (p. 26).” In the U.S., to remediate this history, new laws were passed and implemented for people with disabilities, including the American Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973. Given these laws granting equitable access to many aspects of daily living, PWDs have received more access to the K-12 and postsecondary settings, leading to better opportunities for gainful employment and a pathway to becoming a contributing member of society.

Statement of the Problem

According to the National Center for Learning Disabilities (2014), within eight years of high school graduation over 67% of young adults with learning disabilities (LD) will enroll in post-secondary education, choosing a community college at twice the rate of their peers without disabilities. However, 41% of students with LD will complete college, a rate that is 11% lower than the general population. In light of the positive correlation between education attainment, gainful employment, and income earnings, those with LD will be disproportionately affected by the lack of educational opportunity and the corresponding impact on unemployment and earnings.

Students with learning disabilities have higher rates of completion of any type of post-secondary training when attending a community college, 41% versus 22% for the general population (NCLD, 2014). The community college setting is an environment a majority of

students with LD access for educational or vocational training. By improving the educational experiences of these students and their outcomes for academic success, their opportunities for professional success will improve as well. Hearing from the students themselves about how they learn to be successful may help to inform the practices and policies of community colleges that serve them.

Background of the Problem

The California community college (CCC) system is the largest postsecondary public education system in the U.S. with 70 college districts and 114 campuses. California community colleges enroll one in 12 U.S. college students with disabilities (CCCCO Data Mart, 2017). State and federal regulations, including the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 have made it mandatory for students with disabilities to get as equitable an educational experience as their peers without disabilities. The CCC system has designated the Disabled Student Programs and Services (DSP&S) to provide “support services, specialized instruction, and educational accommodations to students with disabilities so that they can participate as fully and benefit as equitably from the college experience as their non-disabled peers” (CCCCO, 2017, para. 1).

The provision of specialized instruction includes educational assistance classes for students with disabilities, more specifically for students with LD. The problem is that there are no learning theories applied or empirical data used to design the curriculum for the educational assistance classes offered by the colleges. “When LD specialists are trained to assess students (who have LD), they aren’t really given instructions or information on how to design or teach classes” (M. Becerra, personal communication, February 14, 2017). To address this perceived gap in the research on students with disabilities, the researcher asked whether educational

assistance classes could enhance and improve the learning experiences of students with disabilities if specific learning theories were integrated throughout the curriculum. If so, do the students who take these classes have input in curriculum design, course content, or whether that content supports their learning?

Purpose Statement

The primary purpose of this study is to examine how community college students with LD become successful academically. Using an exploratory phenomenological approach, this study examined metacognitive awareness in students who were identified as being successful in community college. This study was conducted with the objective to establish a foundation for creating specific academic supports for this population of students based on the learning strategies of the successful college student with LD. The results of this important research could inform the practice of both disability support programs housed in the California community colleges and the college instructors who teach these students. The most important purpose of this study is to improve awareness provide ideas for students with LD on how they can become successful in reaching their college goals.

Guiding Central Research Question

To inform students, faculty, and scholars with this study, the researcher asked the following question to California community college students with LD who were identified as being academically successful: to what do you attribute your acquisition of skills and abilities which led you to being academically successful?

Significance of the Research

The significance of this research is that it can positively impact the educational experiences of many students with LD who attend a California community college. It can also

inform the practice and training of the LD Specialists who teach in the DSP&S department and directly affect the instructional policies and curriculum designed to support students with LD. Given that the community college system in California enrolls a large number of college students with disabilities, the findings of this study could affect the way community colleges nationwide teach hundreds of thousands of students with disabilities. This is significant given the increasing number of students with disabilities enrolling in postsecondary education.

Increasing number of students with disabilities attending college. The focus of this research is the lived experience of students with learning disabilities who are enrolled in the CCC system. Of the 2.37 million students in the 2016 – 2017 academic year, the California system enrolled over 124,000 students who registered with DSPS (CCC Data Mart, 2017). While the number of students with disabilities annually registering with DSPS accounts for a little more than five percent of all those attending California community colleges, these students represent one in twelve of all students with disabilities nationwide enrolled in U.S. colleges.

There are many factors related to the increasing numbers of students enrolling in the community college. Among them are more students with LD are graduating high school and accessing postsecondary education; disability laws have been established to ensure college access for people with disabilities; adult onset of disability or chronic illness is forcing people to come back to college for vocational or academic training; and the aging population of the United States. The increase in students has more than an effect on numbers. There is also an increase in the spectrum of disabilities being accommodated and in the number (and complexity) of accommodations needed to serve students within this domain (Hall & Belch, 2000). Despite the services available to help students with disabilities access the postsecondary setting, achievement gaps still exist.

Gaps of achievement for students with LD. Approximately 33% of students with disabilities who enroll in a four-year college or university graduate within eight years; for those who enroll in two-year schools, the graduation rate is higher at 41%. The Institute of Education Sciences (IES) National Center for Education Research (2011) performed a federal study of the postsecondary outcomes of students with disabilities. This study followed students for several years after high school graduation and found that students with disabilities are less likely to enroll in and complete college (IES). If these students joined the workforce upon graduation, they earned nearly \$4 less per hour than their peers without disabilities (IES).

However, the enrollment rate of students with learning disabilities enrolled at any postsecondary school was higher among young adults with learning disabilities at 61%. According to this same study, within 6 years of leaving high school, of the 63% of students with disabilities who had ever enrolled in any postsecondary education or training, but no longer were attending, less than half (38%) graduated from or completed their programs (IES). These statistics indicate that there may be differences in how these students are experiencing and accessing the postsecondary environment.

The California community college system has acknowledged the disparities in achievement of various groups enrolled in its colleges and has instituted mandates to address these disparities. Students with disabilities have been identified as one of the groups that campuses need to provide services which can result in an academic experience and academic success equitable to their peers without disabilities. “Title 5 regulations specify that colleges must review and address the following (groups) when looking at disproportionate impact (to include) persons with disabilities” (CCCCO, 2015, para. 2). The results of these activities are to be submitted to the Chancellor’s Office and are tied to the funding allocation of each campus.

In light of the statistics regarding the academic outcomes of students with disabilities and the mandates to provide supports designed to improve those outcomes, this study could serve to inform the policies of California's community colleges, as well as the professional practices of DSPS programs and community college educators alike.

Enhancing my professional knowledge and practice. Research in this topic will expand my professional knowledge regarding the education and support of students with LD, which is my current role as an educator of this population in the California community colleges. The findings of this study will improve my skills as an instructor of community college students who use DSPS offerings to access their education and who learn which academic accommodations and learning strategies will lead them to academic success. Because I have professional experience as a DSPS staff member and educator of students with LD in the CCCs, my lived experiences in this role have profoundly influenced my choice of this research topic. I have encountered far too many of the challenges as a DSPS employee in the community college model, many of which have been difficult, and, in some cases, surreal. The politics of the college campus, the demands of teaching, and the reality that there is no assurance that students will succeed remain difficult issues for me to grasp. I am grateful to the voices of students with LD who have helped me make sense of the skills needed to do my job effectively and to provide them with a quality learning experience.

The real life narratives of these students, along with my personal experience as a college student with disabilities, has aided in my continued work as a CCC educator. Because of the positive influence of the students' voices on my professional development and practice as a DSPS professional, my goal was to research the phenomena of being an academically successful CCC student with LD, something that has not been studied explicitly 30 years after the

implementation of DSPS in the CCC system. Still there remains a gap in the use of research theory in the professional life of most (DSPS) practitioners (Hirsch, 2000). I hope this study will help to bridge this gap by providing research based upon the student's voice, using my professional experiences as a tool to provide useful and practical information to those who are new to teaching in DSPS or to those who are considering entering the field.

Need for this Research

This research is needed in order to understand how college students with learning disabilities acquire cognitive skills as they access their courses in the California Community College system, especially given the research supporting metacognition as a tool that is helpful for this student population. By conducting research and understanding how students with LD acquire metacognition, both educators and instructional designers can support students by giving them the tools that they will need to be successful at the community college and beyond.

The results of this study address an identified gap in the literature regarding the needs of students with LD attending college. This study gives voice to students with learning disabilities who are pursuing their academic goals at a California community college, a perspective which I have not found in the current literature. Their perspective on how they acquired and employed metacognition during their learning experiences will be invaluable in informing the design or revamping of educational interventions provided by the community college, most notably educational assistance classes. By listening to the students and taking their lived experiences into consideration, postsecondary educators and scholars can better perform research and design curriculum and services that will address the unique needs of students with disabilities.

Furthermore, this study used a tool that has been identified and validated to measure the acquisition of metacognition: the Metacognition Awareness Inventory (MAI). The results of this

study showcase this instrument as a tool for both the instructors and the students, leading to updated research about this inventory and its potential impact on instructional design.

Philosophical Approach: Pragmatism

The researcher has a pragmatic worldview which has been directly influenced by his personal experience of being a student with learning-disabilities and by his profession as an educator of college students with disabilities. The pragmatist view is one that looks for what works, and by using both objective and subjective knowledge, the pragmatist is searching for the truth (Creswell & Clark, 2010). The pragmatist paradigm has been championed by such classic scholars such as Charles Sanders Pierce, William James, and of course John Dewey (Creswell & Clark, 2010). Furthermore, the pragmatist worldview is well-suited for alignment with the phenomenological approach, the approach the researcher used for this research study. In the search to identify what strategies students find successful and that can be incorporated into his practice, the researcher found the pragmatic approach the most suitable for this study.

Assumptions of the Pragmatic Approach

Pragmatism, a philosophical approach that was developed in the U.S. in the late 1800s, is based on finding solutions to real world problems through the generation of useful knowledge (Iaydjiev, 2013). A central tenet of the pragmatic method is the dedication to outcomes that inform practice by identifying solutions. Pragmatists believe that theories are tools that should help people navigate a complex social world. As humans experience the world around them, they will encounter challenges, some of which cannot be addressed using old concepts or rules, therefore requiring the generation of new knowledge.

The pragmatic researcher actively employs those tools and techniques that can effectively generate new knowledge to address new challenges. The knowledge generated must be

evaluated by other scholarly and outside communities to decide its usefulness, recognizing the practice of reflective discussion among these communities. From this, it can be shown that for pragmatists, the truth can be interpreted (or debated) “in light of its usefulness in new unpredictable situations” (Iaydjiev, 2013, para. 5). This results in pragmatic knowledge being contextually and situationally relevant and can lead to new theories of practice and the generation of knowledge.

For the purposes of this study, the researcher assumed that the study participants acquired cognitive skills and an awareness of their learning process that could be measured in part one of the study (quantitative strand), and the findings from the quantitative data collection would influence part two of the study (qualitative strand) by identifying knowledge strands to further explore.

Definition of Terms

In the literature reviewed for this study, students with disabilities were identified by adhering to the definition of the Americans with Disabilities Act (ADA):

a person who has a physical or mental impairment that substantially limits one or more major life activities, a person who has a history or record of such an impairment, or a person who is perceived by others as having such an impairment. (Department of Justice, 2017, para. 2)

Students with learning disabilities are defined, most simply, as people having

A condition of presumed neurological dysfunction which may exist with other disabling conditions. The dysfunction is one that cannot be explained by the lack of educational opportunity, lack of proficiency in the language of instruction, or other non-neurological factors, and the dysfunction limits the ability of the student to access the educational process. (CCCCO, 2016, p. 8)

For the literature review, the researcher used different terms that mean the same thing to refer to programs designed to support students with disabilities: Office of Disability Services (OSD), Disability Support Services (DSS), and Disabled Student Programs and Services

(DSP&S). For the purpose of the literature review, DSPS will be used because it is the generic term for the programs housed within a California community college. Educational assistance classes are defined as

instructional activities offered...[and] designed to address the educational limitations of students with disabilities who are admitted to the institution... and who would be unable to substantially benefit from general college classes even with appropriate academic adjustments, auxiliary aids and services. (CCCCO, 2016, p. 6)

Summary

This chapter introduced the focus and significance of this research which is to identify ways to improve the academic success of students with LD who attend a California community college. For thousands of years, people with disabilities have been marginalized and discriminated against in various societies. In the U.S., this systemic discrimination led to civil rights legislation that addressed the need for equitable access for people living with a disability, including the pursuit of a college education. The statistics citing lower levels of college enrollment, college completion, and gainful employment of this student population were the problems leading to the need to delve into the lived experiences of successful community college students with disabilities.

The purpose of the study is to employ an exploratory phenomenological design to answer guided questions regarding what strategies students with learning disabilities utilize to be successful in the postsecondary environment. The question guiding this research asks to what do these successful students attribute their acquisition of skills and abilities that have facilitated their academic success. The significance of this research is rooted in the lack of equitable postsecondary outcomes of students with LD. The research stems from the need to address the increasing number of students with disabilities enrolling in college, reducing the achievement

gaps students with disabilities, and enhancing the professional knowledge and practice of DSPS educators.

This research examines the voices of students with LD and seeks to understand how community college students with LD become successful. The researcher's philosophical approach to the study is pragmatism. The pragmatic approach attempts to identify solutions to real world problems and seeks to put into practice those solutions that work, objectives the researcher hopes to facilitate through this study.

This section provided a definition of terms related to the study, including the definition of learning disabilities, the laws governing the access to an equitable education, and the various names used to represent DSPS. These definitions serve to clarify the terms used throughout the study and inform those reading the study. The next section of this study discusses the literature reviewed regarding the research topic and includes the gaps in the literature found by the researcher.

Chapter Two: Literature Review

The purpose of reviewing this literature was to gather and assess the available academic research relevant to the topic of metacognition and the community college student with learning disabilities. The focus question guiding this literature review was what does the current literature reveal about the use of metacognition to support the educational experiences for students with learning disabilities attending the California community colleges. A thorough review of the literature was made to identify meaningful themes, ideas, data analyses, and interpretations that would contribute to the research.

Approach to the Review of Literature

The literature review started with a search of the online databases at Pepperdine University libraries, focusing on qualitative and quantitative studies that discussed metacognition; metacognitive awareness; metacognition in the classroom, metacognitive awareness and college students, metacognitive awareness and students with learning disabilities; post-secondary disability support programs; the California community colleges; social learning theory; situated learning theory; and metacognitive social learning. The primary data sources were Pepperdine University's Research Database. Educational Resources Information Center (ERIC), FirstSearch, Academic Search Premier, EBSCOhost, Dissertation Abstracts, Google Scholar, and Questia.com were also used as search tools. The primary search strategy included peer reviewed journals, dissertation abstracts, and references from selected reports and articles.

Organization of the Literature Review

The review of literature is organized into major areas of focus relating to the purpose of the study. First, the historical framework for post-secondary institutions and students with disabilities was reviewed, to include laws and regulations that have led to the creation of on-

campus support programs for this student population. This will serve to provide some background and context to the research topic. Secondly, the California community college system's disability support programs and services (DSPS) will be explored, the purpose of which is to discuss the specific supports mandated by the state for students with disabilities. This section includes information about DSPS staffing, accommodations, assistive technologies, and educational assistance classes.

Lastly, I discuss the literature that describes the theory of metacognition and its primary constructs: metacognitive knowledge, metacognitive knowledge, metacognitive experiences, metacognitive awareness, and metacognitive regulation. This section includes literature regarding metacognitive learning strategies and whether metacognition can be taught. I will discuss strategic content learning, compensation strategies, and metacognition cognitive tools as identified avenues to teach metacognition skills to students. I will also discuss situated learning theory and metacognitive social learning strategies as important theories to support the acquisition of knowledge for the academic success of college students with LD. The sections of this review are designed to establish what is already known in relation to this study's purpose and guiding research question.

Historical Framework for Post-Secondary Institutions and Students with Disabilities

There's been an increase of people with verified disabilities attending postsecondary institutions since the mid-1970s, and since the early 1980s, many of these institutions have had to adapt to serving this population by identifying and addressing their special needs. The California Community College system (CCC), the largest public post-secondary education system in the nation first addressed the importance of supporting the college student with disabilities with the passing of Assembly Bill (AB) 77 (CCCCO, 2016, p. 2). This bill is known

as the Lanternman Bill and established funding, specific requirements, and implementation guidelines to help the community colleges to support and accommodate students with disabilities (Skinner-Martin, 2006). In order to comply with the Lanternman Bill, the CCC system established Disabled Student Programs and Services (DSPS).

According to Title 5 DSPS Implementing Guidelines provided by the California Community College Chancellor's Office (CCCCO), the program's charter has several mandates that must be adhered to in order to stay compliant with the laws and in order to receive special funding to support this special population. The program is required to assist people with a verified disability that results in educational limitations, defined as "a disability related functional limitation in the educational setting...(that) prevents the student from fully benefiting from classes, activities, or services offered to nondisabled students, without specific additional support services or instruction (CCCCO, 2016, p. 9)." According to Windy Martinez, an administrator of DSPS at a CCC with several years of experience managing DSPS programs, "the beauty of the DSPS program is it helps students with disabilities access the supports they need to be successful, such as counseling, tutoring, and test-taking accommodations (personal communication, December 24, 2016)."

DSPS programs comply with AB77 as well as with other laws that have been established to protect the rights of people with disabilities, most notably Section 504 of the Rehabilitation Act of 1973, which ensures that students with disabilities get accommodations for their coursework, including alternate media and assistive technologies. Alternate media is print material that is converted into an alternate format like large print, digital text, or Braille. Assistive technologies help students who require technology to effectively access their course materials, complying with Section 508 of the Rehabilitation Act.

Laws and Regulations

According to Martin et al. (1996), for thousands of years, people with disabilities, mental impairments, and physical limitations have been subjected to persecution and discrimination in many different cultures. On every continent, there are records of exclusion, isolation, and extermination of people with disabilities. This history of discrimination against people with disabilities is why Congress enacted legislation for the benefit of Americans with disabilities, the first being the aforementioned Rehab Act of 1973 and later amended to the Americans with Disabilities Act (ADA) in 1990. The second law that impacted education access for learners with disabilities was the Education for Handicapped Children Act of 1975, now called the Individuals with Disabilities Education Act (IDEA, 1990), and it guarantees free, appropriate public education for all children with disabilities. In order to better understand the policy proposal, it is important to understand the history of how the United States arrived at this point in educational policy regarding people with disabilities.

Relevant Legislation

In the mid-1800s, the federal government tried to implement laws regarding people with disabilities, but at the time it did not impede on states' rights regarding education thus the next attempt to influence educational policy by the federal government occurred in the 1950s. Two major events occurred during this decade that prompted the federal government to enter into educational policy. The first was in 1954 with the decision of Brown versus the Board of Education of Topeka, Kansas which ruled that states had to desegregate their public schools based on the 14th amendment (Martin et al., 1996). Then, after the launch of Sputnik, America realized that it was in an academic crisis and needed to revamp the American education system

to produce more college graduates, scientists, and technologists. This led to the creation and passage of the of the National Defense Education Act (Mitchell, Crowson, & Shipps, 2011).

These laws were the catalysts for the federal government to enforce the rights of all citizens regarding educational policy and access. In 1965, the federal government enacted the Elementary and Secondary Education Act, “the first major federal effort to subsidize direct services to selected populations in public elementary and secondary schools...It remains the primary vehicle for federal support of public schools today (Martin et al., 1996, p. 27).” Even though the act included a funding mechanism, people with disabilities were still denied access to public education, and “(u)ntil the mid-1970s, laws in most states allowed school districts to refuse to enroll any student they considered ‘uneducable,’ a term generally defined by local school administrators (Martin et al., 1996, p. 26).” Although these laws supported students with disabilities, many administrators still denied student access to education. Many families were told that their child was being denied access due to lack of funding as well as the very limited choices in curriculum. Often because school administrations were not willing to accommodate learners with special needs, some of whom were expelled from school because of their disability status.

In 1972, two major Supreme Court decisions led many school district administrations to begin creating policies to support people with disabilities. The Supreme Court heard *Pennsylvania Association for Retarded Children (P.A.R.C.) versus Pennsylvania*, and *Mills versus the DC Board of Education*, two cases that would change the landscape of disability reform. In 1972, P.A.R.C. sued the Commonwealth of Pennsylvania, charging that public school administrators were using state laws to avoid educating people with developmental disabilities.

Before this case, Pennsylvania law had allowed that children with developmental disabilities who were deemed by a certificated professional as:

Being uneducable and untrainable in the public schools, may be reported...to the Superintendent of Public Instruction and when approved by him, (the child) shall be certified to the Department of Public Welfare as a child who is uneducable and untrainable in the public schools (and) the public schools shall be relieved of the obligation of providing education or training for such child. (Masterson, 1972, p. 24)

In effect, if the appropriate professional deemed a student uneducable, the student had no recourse and school districts were free from the obligation to support these students.

The Mills case was brought to court the same year as P.A.R.C. and extended the impact of the P.A.R.C. case to help children with all disabilities. A class action lawsuit, Mills represented seven families with children with various mental, behavioral, physical, or emotional disabilities. They were children who had missed significant amount of schooling because the curriculum could not accommodate them. Although the District of Columbia school system agreed that it was legally obligated to educate all of its citizens, lack of financial resources made it impossible to provide the resources the students needed. The Court ruled that no child can be denied a public education and that the lack of funds is not a defense for denying educational access.

The PARC and Mills cases opened the floodgates for more legislation because laws like these forbid administrators from denying students with disabilities the access to participate in public education. The cases paved the way for the federal government to update and enact comprehensive laws such as the Rehabilitation Act of 1973 and the ADA, two laws that served to identify and protect the civil rights for students with disabilities. For example, Title II of the ADA gives an explicit definition of reasonable accommodations, requiring reasonable accommodations to qualified individuals with disabilities who are employees or applicants for

employment. In general, an accommodation is any modification or adjustment in the work environment or in the way processes are customarily done that will enable an individual with a disability to enjoy equal employment opportunities.

Rehabilitation Act of 1973: Sections 504 And 508

The Rehabilitation Act of 1973 sections 504 and 508 are those most pertinent to education and educational institutions as these are laws that directly influence public education policy and practice. The passage of these laws created the pathways that allowed students with disabilities the opportunities to access free appropriate public education and access to higher education.

Section 504

Section 504 mandates that people with disabilities must have access to programs, goods, and services from all programs that receive any federal financial support or assistance of any kind, even if the entity providing the service or program is not a federal or state organization. This mandate means that an organization must comply with Section 504, even if the organization is partially funded by federal funds. This legislation mandated that there be equal access for students with disabilities in higher education who were found to be eligible for and receive benefit from services in higher education. Also, Section 504 is the foundation for the process of individualizing reasonable accommodations for people with disabilities, and makes allowances for undue burden caused by accommodating a person with disabilities. This clause does not apply to postsecondary institutions. Section 508 and The Telecommunications Act section 255 govern the physical devices that require the technology industry to comply with the Rehabilitation Act of 1973.

Section 508

Section 508 of the Rehabilitation Act of 1973 covers access to electronic devices and the Internet. Due to the proliferation of technology, when the Rehabilitation Act was revised in 1990 (the ADA), the government realized that they needed to update and revise the standards of the legislation in order to keep up. The ADA made sure that “Section 508 was enacted to eliminate barriers in information technology, to make available new opportunities for people with disabilities and to encourage the development of technologies that will help achieve these goals (General Services Administration, 2017, para. 1).” This law mandated that public entities, including the federal government, state governments, and local agencies, offer equitable access to technology to people with disabilities. These two laws impacted public education organizations in that these entities had to ensure that their organizations provided supports and services to accommodate people with disabilities.

Disability Support Programs and Services

According to the California Community College Data Mart, the state community college system enrolled over 121,000 students with disabilities last year. Of those students with disabilities, nearly 15% were students with learning disabilities (LD; CCCCCO Data Mart, 2017). While many colleges would find it challenging to identify the individualized reasonable accommodations for all of the eligible students, each campus has designated a Disabled Students Programs & Services (DSPS) to provide support to students with disabilities. These supports include but are not limited to assessment, alternative media, assistive technology, and educational assistance classes.

Furthermore, these services can be extended if the populations of students with disabilities need more services to be academically successful (CCCCO, 2016, p. 23). Depending

on the size of the DSPS program throughout the state, there need to be qualified staff employed to provide services and programs. There may be different configurations of DSPS staffing throughout the California community college system, but the Chancellor's Office DSPS guidelines for the programs implementation provide a framework for hiring appropriately qualified DSPS staff.

Disabled Students Programs & Services (DSPS) Staffing

According to the Chancellor's Office (2016), the staffing requirements are typically a DSPS director or coordinator of the department, whose minimum qualifications are a graduate degree in counseling and professional experience working with people with disabilities. The director of the DSPS duties include "integration of DSPS into the college's instruction and services, the provision of academic adjustments, auxiliary aids, and services, maintaining knowledge of the legal responsibilities regarding students with disabilities participation in the educational process, and budget planning (p. 71)."

Many colleges offer the services of an LD Specialist or educational assistance courses designed to address the needs of students with LD. These specialists must have post-secondary degrees and certifications for administering cognitive testing for students who may qualify for programs for students with learning disabilities. Program counselors must meet educational requirements that include graduate degrees and professional experience providing counseling to people with disabilities. Students can be qualified for DSPS services after meeting with DSPS Counselors or after qualifying for LD services through the LD assessment process. Those students determined to have a verified disability are prescribed academic accommodations to help ameliorate their disability.

An Assistive Technologist may be a part of the DSPS personnel qualified to work with students enrolled in DSPS. The Assistive Technologist is often a faculty member who teaches assistive technologies (AT) to help students learn to access the technologies they use to be successful in their academic coursework. Some of the technologies students are exposed to include Kurzweil, Inspiration, and Dragon Naturally Speaking to facilitate learning throughout all of the academic disciplines. Furthermore, an Alternate Media Specialist works on each campus to ensure students with print disabilities (most notably students LD, visual impairments, or blindness) have access to their course materials.

Accommodations

An accommodation is defined as “an alteration of the environment, curriculum format, or equipment that allows an individual with a disability to gain access to content and complete assigned tasks. Accommodations enable students with disabilities to pursue a regular course of study (Washington, 2017, para. 1).” Without accommodations students with disabilities would be hindered from accessing and completing their coursework in the same way as their peers without disabilities. Technology plays a crucial role in helping students with disabilities be academically successful as both assistive technology and alternative media facilitate knowledge acquisition and the learning process.

Assistive Technology/Alternative Media

Assistive technology (AT) is a powerful tool used by students with learning disabilities to help facilitate their learning. According to Rose, Harbour, Johnston, Daley, and Abarbanell, (2006), AT is specifically designed to help students with LD to overcome the barriers caused by their disability. There are several different forms of AT which can be sorted into one of two categories: low-tech and high tech. Low-tech AT devices would be those that require little

training to use and are often less expensive. Magnifying glasses, a walking cane or walker, and large print are examples of low-tech supports. High-tech AT is that technology or equipment that requires more training, have digital components, and will require more effort for effective use. High-tech AT includes screen readers, digital planners, and voice recognition software to help the student with disabilities to enhance their learning capabilities (Rose et al., 2006).

Alternative media is described as making print material accessible to people with a learning disability. Some common alternative media include Braille, closed-captioning, audio files, e-text, and tactile graphics for visually impaired (Wolfe & Lee, 2007). These different formats can drastically improve the performance of students with disabilities in their educational assistance classes and traditional college classes. “Alternate media is so important to the community college mission in (California) the Alt Media Specialist is a mandated position (W. Franklin, personal communication, November 12, 2016).”

Educational Assistance Classes

In order to fulfill the mandate of AB77, some DSPS offer educational assistance classes, defined by the Chancellor’s Office as “instructional activities designed to address the educational limitations of students with disabilities...who would be unable to substantially benefit from general college classes even with appropriate (accommodations; Implementing Guidelines, 2006, p. 6).” Although these classes meet the standard requirements for course offerings, they also have additional guidelines and regulations such as;

- a) Being designed to enable students with disabilities to compensate for educational limitations and/or acquire the skills necessary to complete their educational objectives;
- b) Employ instructors who meet minimum qualifications;

- c) Utilize curriculum, instructional methods, or materials specifically designed to address the educational limitations of students with disabilities; and
- d) Utilize student/instructor ratios determined to be appropriate by the District given the educational limitations of the students with disabilities enrolled in each class.

California community college districts with educational assistance classes have no mandated instructional design or consistent learning theory guiding instruction in the development of these courses. Although there are no specific regulations regarding a theoretical framework for educational assistance courses, the most effective classes may be those that have one. There are several learning theories that have been tested with students for the purpose of understanding how students can become self-regulated learners, learners who understand their own learning limitations and strengths in order to make effective changes in how they acquire knowledge (Butler, 2002; Garner, 1987; King, 1991; Orr & Hammig, 2009; Pintrich & De Groot, 1990).

The program, the accommodations, and the specialized attention provided to CCC students with disabilities are a legacy of the work of California's legislation and the CCC system. However, the researcher believes that the LD programs of the California community college system are missing a crucial component when it comes to teaching students with disabilities. That missing component is metacognition. The ability for students with LD to acquire a metacognitive skill set could be the missing link in achieving their academic success in the CCC.

Educational strategies to support student success. Educational assistance classes often include teaching educational strategies to students with learning or other cognitive challenges. Educational strategies are the skills and practical applications used in the classroom to help students access the curriculum and are employed by students to help them use what they learn in

the classroom in order to be successful in completing academic tasks. The NCWD (2012) listed several strategies that can be employed in the classroom to promote student success, among them:

- Organize activities to address task and time management;
- Provide a learning environment that is conducive to learning (e.g. stimulus reduced setting);
- Give feedback on the assigned tasks and periodically review student progress;
- Motivate students to ask questions when confused with directions;
- Emphasize the intent of the task;
- Provide notes on the task or topic;
- Utilize group activities to encourage social learning;
- Tape record directions easy reference.
- Integrate assistive technology into the classroom (e.g. audio books, reading tools, voice-to-text software).

When introduced in the classroom, these strategies will benefit all students regardless of disability status as they will learn to identify those specific strategies with the most positive impact on their educational experiences. Although DSPS educational assistance classes are designed to support college students with LD, little is known about the theoretical framework(s) these classes are based on. An objective of this study is to introduce the employ of metacognitive techniques to these courses as an effective tool to improve the learning experience of this student population.

What Is Metacognition?

Since John H. Flavell introduced metacognitive theory in the mid-1970s, it has been shown to improve the learning capacity of those students who use it, regardless of disability status. Defined in the simplest terms as cognition about cognition, or thinking about thinking; one must think beyond one's cognition in order to reach meta-cognition. According to Flavell (1979), metacognitive knowledge has primary advantages or elements that act upon the cognitive experience and can affect the outcome of the metacognition on the experience. There are four

major elements of metacognition: metacognitive knowledge, metacognitive experiences, goals (or tasks), and actions (or strategies).

Many authors have contributed to the theories presented by Flavell and their components. Zimmerman (1986) elaborated on Flavell's definition of metacognition, further describing it as changing the behavior and the capacity to adapt to the demands of an environment that are ever-changing in the academic milieu. Kluwe (1982) further added the importance of two major constructs to the framework of metacognition: declarative knowledge or "the (thinker) has some knowledge about his own thinking and that of other persons"; and procedural knowledge or "the (thinker) may monitor and regulate the course of his own thinking...act(ing) as the causal agent of his own thinking (p. 52)." Kluwe further clarified declarative knowledge as knowledge that is pre-existing and resides in a learner's memory, whereas procedural knowledge includes pre-existing procedures that are currently known by the learner.

According to Schraw (1997), there are two areas of metacognition, metacognition awareness and metacognitive regulation, that are crucial to understanding how students can benefit from it. Metacognition awareness is the ability of a student to understand what they have learned and apply their new skill set to different situations. Metacognitive regulation is the ability of a student to regulate their own learning and learning strategies. In practice, these two constructs may help students be more proficient and successful in their academic endeavors. Researchers have introduced different point of views to augment and to further Flavell's original theory provide a deeper and better understanding of how metacognition theory can stimulate the learner's capacity to be their own agent of knowledge acquisition.

Metacognitive Knowledge

Metacognitive knowledge is knowing and understanding how to interact with your environment given variables that may or may not change the outcome of the cognitive domain (Flavell, 1979). There are three major components of cognitive enterprise: person, task, and strategy. These three elements comprising the cognitive enterprise help learners acquire metacognitive knowledge simultaneously why they are actively engaging in a metacognitive experience.

The person component is when a person acknowledges and understands that people are cognitive beings with a vast understanding of cognitive tasks, actions, goals, and experiences. An example of this would be someone who believes that they are good at English and they believe that they have severe difficulties in doing mathematics or they believe they better comprehend material by using their auditory memory as they read it. Metacognitive knowledge is further defined as knowledge the learners gain via the tasks they undertake and the learning strategies they use during the academic task (Baker & Brown, 1984; Garner, 1994). Task domain is described as understanding the elements that are presented to the cognitive enterprise and realizing how a person should manage their task in order to fulfill the cognitive goal (Flavell, 1979). An example of a task is when a learner is acquiring knowledge, they may believe it is easier to understand the concepts than it will be to remember them verbatim.

Strategies involve the use of the variables while managing a cognitive task and are implemented to handle those variables that present themselves in order to affect learning outcomes and goals. An example of strategies is when a learner repeats their lessons in their own words out loud, so they can retain the information more efficiently. Variables used while managing a task include making sure that the learner knows that they have to manage the

environment to have a productive learning milieu, understanding the given assignment that the learner has been assigned will help the learner managing all the elements that are involved in the given task.

Metacognitive Experiences

Metacognitive experience is when an activity that is germane to any intellectual endeavor directly affects one's knowledge regarding that activity (Flavell, 1979). One example of a metacognitive experience is when an instructor is lecturing and a listener realizes they did not understand what the instructor has said. Metacognitive experience usually affects the learner in one of two ways; either they understand and are aware that they had a metacognitive experience or they can deduce the metacognitive knowledge from metacognitive experiences. According to van Velzen (2016), metacognitive knowledge can be achieved through metacognitive experience when the learner discovers that their current learning strategies are not working and they have the flexibility and ability to change course to look at other means of learning the subject material. Most likely, when a learner is overwhelmed and is not grasping what they need to do for an assignment, then that particular metacognitive experience will not be able to be internalized as metacognitive knowledge.

By the student using the cognitive thought process such as previous metacognitive knowledge, they achieve the best metacognitive experience through the intellectual thought process and knowledge acquisition resulting in a better outcome of the learning experience.

Metacognitive Awareness

Metacognitive awareness is the learner's ability to be aware of how they think. It has three components that help explain the importance of a learner acquiring this awareness: declarative knowledge, procedural knowledge, and conditional knowledge. Declarative

knowledge is when a student understands their abilities, skills, and capabilities to learn. The learner understands the motivation and the influences that help them act to call upon the knowledge that they have already learned (Baker, 1989). Furthermore, learners with metacognitive awareness recognize the limits of their memory and the capability of their knowledge (Garner, 1987).

Procedural knowledge is how knowledge is used to apply strategies in order to facilitate learning. A learner who uses procedural knowledge has the ability to access and apply their knowledge fluently (Schraw, 1998). Users of procedural knowledge identify different ways and have many different strategies they can implement to solve problems (Borkowski, Carr, & Pressley, 1987). One of the best examples of this is knowing when and how to chunk knowledge together for future use.

Finally, conditional knowledge is the ability to understand when and why to use these strategies (Schraw & Graham, 1997). Successful learners use conditional knowledge to better comprehend how to allocate resources to be more effective learners (Reynolds, 1992). By having the ability to use conditional knowledge learners are able to adapt and change accordingly to any learning assignment that is undertaken (Schraw, 1998). Metacognitive awareness would not be as efficient without its counterpart metacognitive regulation. Metacognitive regulation allows the learner to get deeper understanding of metacognitive awareness when reflecting on the metacognitive experience.

Metacognitive Regulation

Metacognitive regulation helps the learner to reflect, monitor, and plan what they have learned. Metacognitive regulation has three components that facilitate learning: planning, monitoring, and evaluation (Zimmerman, 2002). According to Schraw (1998), planning is when

a learner sets goals and allows time and resources to facilitate their learning, including understanding different strategies like sequencing or predictions. Monitoring is when the learner understands what they learned and how they learned it. Students who self-monitor use self-testing strategies to accurately regulate their understanding of what they are learning (Schraw, 1998). Evaluation is the learner's understanding of how well their strategies and their performance was after the academic event (Schraw & Graham, 1997).

By using all three of these metacognitive strategies, a learner is able to better acquire and facilitate their learning via self-monitoring techniques to allow them to understand if they have missed any key components of their learning goal. Alison King (1991) conducted studies in the early 1990s looking at guided strategic questioning with fifth and sixth graders who were using computer software to help with problem-solving needs. This study asserted that using metacognitive activity would enhance the understanding of adolescent learners during problem-solving exercises. The purpose of the study was to identify a way to enhance the student's own metacognitive skills to regulate their own learning. The researcher believed students could be trained to use metacognitive techniques to learn problem-solving techniques to improve their learning ability (King, 1991).

King (1991) conducted one of her study's using 46 fifth-graders, 18 females and 28 males, randomly paired up in their classes. The participants were assigned to three separate classes of the same discipline: section one students received training on guiding questions; section two students received training without guiding questions; and section three students were the control group who received with no training or instructions in regards to questioning. Each group was paired according to gender (boys with boys and girls with girls) to reduce the typical adolescence behavior that boys and girls demonstrate at this time in their development.

A problem-solving card was designed which listed questions to reflect the three major components metacognitive regulation: planning, monitoring and evaluating (Table 1). The students in section one received both a card and additional training on how to use metacognitive regulation strategies. Students in section two had no prompt cards and instead were encouraged to ask questions to dig further into problem-solving by asking questions. The control group received nothing in either the form of teaching or guidance questions.

Table 1

Prompt Card

PLANNING
<ol style="list-style-type: none"> 1. What is the problem? What are we trying to do here? 2. What do we know about the problem so far? What information is given to us? How can this information help us? 3. What is our plan? 4. Is there another way to do this? What would happen if...? 5. What should we do next?
MONITORING
<ol style="list-style-type: none"> 1. Are we using our plan or strategy? Do we need a new plan? Do we need a different strategy? 2. Has our goal changed? What is our goal now? 3. Are we on the right track? Are we getting closer to our goal?
EVALUATING
<ol style="list-style-type: none"> 1. What worked? 2. What didn't work? 3. What would we do differently next time?

Note. Adapted from “*Effects of training in strategic questioning on children's problem-solving performance.*” by King, A, 1991 *Journal of Educational Psychology*, 83(3), p. 307.

There were four problem-solving software programs that were employed in the study: Safari Search, The Pond, Rocky Boots, and The Factory, each designed to work with fifth-graders in the classroom. All the software was chosen based on the same characteristics and similar problem solving activities.

The students using Safari had to find hidden animals behind one of 25 squares on a five by five grid and were navigated by three clues to do so: hot, warm, or cold (King, 1991). The clues that were given to the children were to figure out the rules of the game and to locate the correct animals set of animals as soon as possible with the least amount of turns. The Pond is a program where students use lily pads in a pond to jump across a maze arranged by a predetermined randomly generated pattern. This software helped illustrate how students understand patterns while problem-solving with the unique affordance of technology (King, 1991).

Rocky Boots was design for logic games where students constructed various logic gates by using specific statements (if, then, or, and) that when arranged correctly would allow simulated electricity to flow through the circuit. It shows a student the logical progression of electricity through a circuit (King, 1991). Finally, the Factory program's goal was to teach the students how to use sequencing by using an assembly line in order to produce products for manufacturing (King, 1991). The factory software used a training method that had three parts. The first part was called Test a Machine, where the students learned how to make products with various machines. Part two was referred to as Build a Factory, where the students use software to simulate billing a factory. Part three was called Make a Product, where the students designed a series of machines in order to produce products. Once they have completed all three steps, the students learned how a factory and products were produced through the factory software (King, 1991).

Over the next three weeks, all of the participants received training on the software as well as towards a better understanding of metacognition. They were all taught think-out-loud strategies when attempting to use software to solve problems (King, 1991). They were told that

this strategy would help their partner understand them better, as well as help both parties see the holes in their logic while trying to solve problems. However, section one (the guiding question group) got further training and demonstrations on how to use the strategy when using Safari Search. The teacher modeled how to use the problem-solving card while she verbalized as she approached a given problem. This pointed instruction showed the students how to use their metacognitive skills to help achieve their learning goals. For the following five weeks, this same class used all of the programs to practice and train their use of metacognitive regulation skills under the guidance of an instructor.

The students in section two (the unguided questioning class) received think-out-loud modeling from their instructor using all four problem-solving programs. This class did not receive the same amount of training as the guiding question problem-solving class did, nor did they receive a guiding question card. The students were instructed to ask questions of their partner, the only strategy that was given to this section. Finally, the control group worked for the same amount of weeks using the same software as the other two classes and the participants received no assistance from an instructor regarding modeling or training of any kind.

The study used multiple measures in order to determine the outcome of the educational intervention, measuring how the students solved problems and the outcome. The researchers recorded each class session to measure the amount of verbal communication between the partners. The researchers also measured the use of factory software in order to create a test to measure transfer of knowledge. The resulting assessment had a limit of 20 minutes where the students had to re-create a blueprint using The Factory software.

The results of the study found that each student pair was perceived as one and that they could not complete the tasks without the other. The results of the study showed that students

who were taught using the guided strategies and had guidance from a teacher solved more problems accurately with a deeper understanding than the group of students with the unguided questions or the control group. With guided instruction in the use of appropriate cognitive tools, this study showed how students can facilitate their own learning.

Metacognitive Learning Strategies

Instructors and institutions have employed various techniques and strategies in order to instruct students, including those with learning disabilities (LD), to acquire metacognition awareness. Several postsecondary institutions have implemented programs to teach learning strategies to students with LD, including Stanford University, Louisiana State, and Muskingum University (Burchard & Swerdzewski, 2009). Since the term metacognition arrived in the mid-1970s, several researchers have concentrated on specific learning strategies for students with LD because these students' ability to employ metacognitive skills is often lacking (Sencibaugh, 2007).

Learning strategies encompass several different approaches for students to use to effectively acquire learning, and for students with LD, these approaches may include note-taking support, audio books, and time management training. These learned behaviors can mitigate the student's barriers to learn new strategies (Burchard & Swerdzewski, 2009). Students with LD are grossly lacking these strategies and abilities to be able to apply them to their own coursework, while their traditional counterparts have often acquired a base knowledge of learning strategies to help them be successful academically (Butler, 1995).

Some students are first diagnosed with a learning disability in elementary or in secondary school, a diagnosis which leads to curriculum standards being modified to support their learning challenges. However, researchers found they are not taught learning strategies to support their

learning strengths and access to the standard curriculum (Reis, McGuire, & Neu, 2000). Some students with LD may find that their academic advisors recommend that the students lower their expectations or change their classes to less rigorous ones in order to achieve their educational goals (p. 125). These advisors appear to be premature in their advice to this student population since research has shown that postsecondary instruction has seen the benefits of teaching students to employ metacognitive strategies throughout their college courses.

According to Burchard and Swerdzewski (2009), many scholars have presented connections between learning strategy interventions for students with disabilities and performance measures. They noted that with adequate practice, students gain new habits that support their development of cognitive skills. To capitalize on some of these strategies, instructors are implementing programs and coursework that can directly and positively affect the cognitive experiences of students with LD. Furthermore, there are several programs that researchers have used to teach and compare the differences between traditional students and students with LD. They found programs that teach the use of Strategic Content Learning (SCL) and Compensation Strategies are the most successful (Butler, 1995; Reis et al., 2000).

Strategic Content Learning

Strategic content learning (SCL) is an educational intervention designed with the theoretical frameworks of self-regulation strategies to help students with LD to understand conceptually how to approach their learning (Zimmerman & Risemberg, 1997). Self-regulated learning and SCL could be described as adjustable and malleable to the flexible response that the intervention is tasked to accomplish (Butler, 1995). Researchers believe that SCL is different in many ways to the traditional instruction of self-regulation as this approach takes into consideration that students will create strategies specific to achieving their goals (Butler, 1995).

In one study, the participants were postsecondary students recruited from universities in the Vancouver, Canada area. The age range of the participants was 18 to 36 and consisted of five women and one male, each of whom had a verified learning disability. The participants chose their own learning modality to approach their skills: three students worked on writing skills, two students worked on reading skills, and the last student worked on math problems. All participants took a pre-test to establish a baseline and a post-test to see if there was a noticeable improvement in their metacognition awareness, in their self-efficacy and performance attributes, and in their educational interventions.

During the interventions, each student met with the researcher to modify or adjust their educational intervention as needed. Nancy was one student who wanted to improve her writing skills and she sat down with the researcher to help her come up with strategies to improve her writing. First, Nancy and the researcher used a question and answer methodology to determine the best course of action for her writing strategies. Together, they discovered that Nancy did not understand what the teacher was asking her to do in her assignments, so Nancy read aloud her assignments. Nancy discovered that she was only skimming over the assignment and not reading the assignment information in-depth to fully understand what was being asked of her. The researcher instructed Nancy to look for the main points of the assignment to make sure that she addressed them in her writing assignment. Once the researcher and Nancy discovered this issue, it was quickly ameliorated as Nancy understood that she needed to read her assignments more carefully for better understanding.

Regardless of the subject being studied, the participants went through a similar process with the researcher to discover the best strategy to improve their metacognitive ability. The results of this study found that on every pre-test question related to metacognition, self-efficacy,

and attribute strategies there were significant improvements after the educational treatment as evidenced by the results of the post-tests. Also, the students themselves recognized the improvement in their metacognitive awareness. The students were interviewed and every student described improvement with their chosen application of an SCL strategy to the subject they were learning.

Compensation Strategies

A research study conducted by Reis et al. (2000) included 12 participants who had a verified learning disability in order to understand how the participants used compensation strategies in order to become successful in postsecondary education. Four of the participants “were identified as having (LD) in elementary school, six were identified in junior high and two were diagnosed in college (p. 125).” All participants were high functioning university students who had learned to compensate for their learning disability. Some of the compensation strategies that were used in this studied were self-advocacy, executive functions, environmental accommodations, student use of counseling services, and the creation of an individualized plan that focused on metacognition.

The researchers discovered that the strategies successful students with LD used most were note taking strategies, library skills, time management, and test taking preparation (Reis et al., 2000). The participants in the study emphasized that time management was the biggest factor to overcome and it was best to manage through self-monitoring activities. Often participants used a day planner or some kind of calendar to self-regulate their daily schedules and activities. Also, learning specialists who worked with students with LD found that teaching students the technique of Survey, Question, Read, Recite, Review (SQ3R) helped the students understand highlighting strategies when analyzing text (p. 127).

The SQ3R strategy is named after a five-step process that was created by France Robert in the mid-1940s and is inherently designed to use metacognitive strategies to enhance the self-regulation of learning (McDaniel, Howard, & Einstein, 2009). Some students found that the strategy was helpful with their reading comprehension and noted that study skills were not taught in high school (Reis et al., 2000). The study strategies that were used by students with LD were broken down into three categories: study and performance strategies (note-taking, time management); cognitive/learning strategies consisting primarily of memory strategies (i.e. flashcards); and compensation supports (use of computer and audiobooks; p. 129). Overall, the researchers determined that the study strategies helped students develop metacognitive awareness and taught them self-regulation of learning to help them be successful in their coursework.

Metacognition Cognitive Tools

Researchers have discovered that most students with disabilities should use some sort of technology to facilitate their learning. According to the results of research completed by Fichten, Asuncion, and Scapin (2014), students with LD identified the following as the most popular assistive technology (AT) tools used: portable scanners, spelling and grammar checkers, note taking devices, alternate format, voice recognition software, digital planners, and screen readers for the visually impaired (p. 370). Many of these technologies have become mainstream. For example, speech to text software was originally designed for the corporate world to decrease the amount of time needed to write; it is now being used by students with all types of disabilities (p. 375). In comparison, digital planners that help students with LD maintain their organizational and time management skills; have been mainstreamed for the general populace. In the work environment today, one would be hard-pressed to find an office without a scanner that uses

optical character recognition, a technology originally designed for use by people with visual and print disabilities (p. 371).

Oftentimes, students with LD use different cognitive domains to compensate for their learning challenges in an effort to effectively navigate their college courses in order to perform successfully. Trainin and Swanson (2005) defined this as cognitive compensation; a student with a disability compensates for the cognitive load that is placed upon them while they are acquiring knowledge. Some areas that are sourced are working memory, general processing, and semantic ability; each enhances the execution of academic scholarship (Trainin & Swanson, 2005). Many students with LD may utilize compensating strategies for the learning barriers by using cognitive tools such as programs that help with reading comprehension and writing.

A cognitive tool is described as a computer application that shares some of the cognition and helps facilitate the construction of knowledge in any discipline that a college may offer (Jonassen, 1995). Assistive technology (AT) is considered a cognitive tool and one example of a more widely known tool is Kurzweil 3000 (K3000). K3000 is multi-faceted computer software that incorporates a comprehensive set of unique features including text-to-speech (reading), writing and study skills (using highlighters to highlight text), and organization toolbars. Students use K300 to acquire knowledge through different learning modalities, most notably auditory, kinesthetic, and visual.

There are other criteria that must be met before an assistive or educational technology is considered a cognitive tool. According to Kim and Reeves (2007), educational software should have the flexibility that gives the learner freedom to determine how the tool should be used under any circumstance. K3000 embodies the definition of a cognitive tool in regards to its flexibility; learners can customize not only the aforementioned toolbars to access their curriculum, but it

makes it easier for the user to apply them. For example, when students with LD are in an English class, they may be asked to highlight the main idea and the supporting evidence with any color highlight they choose. The students then take their highlighted materials and transform them into a working outline allowing the students to reflect on what they have read. Kurzweil 3000's cognitive tools allow students to understand metacognition by having them reflect on why they highlighted the main idea and the supporting evidence.

Kurzweil 3000 is a technology that clearly demonstrates the bidirectional learning that Kim and Reeves (2007) described when students use a cognitive tool and it becomes an integral part of a bidirectional flow of information. The learner is acquiring knowledge from the technology while at the same time the technology is transmitting information to the learner. When a student engages the K3000 reading application, the learner is actively listening to the tool's synthetic speech and acquiring knowledge.

Another example of a successful AT is the Smartpen, a digital pen that records as the user writes or takes notes. The pen is simultaneously recording in alignment with every pen stroke, synchronizing the notes with the audio of a lecture. This tool is very useful to a student with LD because it allows them to facilitate their learning by self-regulating the amount of time they need to attend to a lecture while they take notes (Patti & Garland, 2015).

Many educators are not aware of the offerings provided by these technologies and are unaware of the supports these programs provide. For example, they often believe K3000 is software that simply reads to students, an opinion that does a serious disservice to this tool. If cognitive tools are to be identified as effective, the instructional designer should ask several questions to ensure the software is accurately assessed for such effectiveness and should be mindful of the original intent of the creator of the technology (Kim & Reeves, 2007). Designers

should also be able to understand the nature of how particular cognitive tools can enhance the learning experience. The instructional designer should understand learning theories and how to implement them in their instructional practice to identify how the software can be used as a cognitive tool and be effectively implemented in a classroom.

Why Students with Learning Disabilities need Metacognition

Metacognition is a subset of critical thinking ability and is often described as the process of thinking about your thinking. It is important in every aspect of life as it includes self-reflection on one's current challenge, future objectives, and possible actions or strategies, and the results of employing those strategies. According to Blake (2016),

Metacognition is the ability to examine how you process thoughts and feelings. This ability encourages students to understand how they learn best. It also helps them to develop self-awareness skills that become important as they get older. People who have developed metacognition are able to assess their thought processes and reframe the way they think to adapt to new situations. (para. 2)

Lerner and Kline (2006) found active students use metacognitive strategies to reinforce their learning, but students with learning disabilities tend to lack the abilities to direct their knowledge acquisition. Traditional students use metacognitive skills on a daily basis without him knowing it and understand how to monitor their learning to be a more effective student. Students with LD ability students do not have the luxury of innate metacognitive ability and would benefit from explicit instruction related to developing these skills.

Metacognition is often considered a reflexive activity in that students must reflect on their learning, which is done by observing, assessing, and identifying compensating strategies to address challenges. When engaging students in the classroom, instructors can employ techniques that will support increasing a student's opportunity to think metacognively as well as give students with LD a more natural learning experience. Instructors who teach metacognition

should be teaching students that learning is fluid; that organization and goal setting is important to learning; and provide an educational environment where they get to consistently practice their learning skills. Ultimately, “(t)he goal of teaching metacognition is to equip students with the tools necessary to monitor their own learning” (Kuntz, 2016, para. 3).

Situated Learning Theory

The researcher of this study found that metacognition has social learning aspects to the acquisition of skills needed to practice learning and to help college students with LD to compensate for their learning challenges. To that end, the tenets of situated learning theory and metacognitive social learning strategies are useful in supporting the belief that metacognitive awareness and abilities are integral to the academic success of this student population.

Metacognition is learning how to learn and applying what is learned in various situations where students are interacting in social situations. Lave and Wenger (1990) theorized this process as situated learning and established that all learning is dependent upon relationships in the social environment, context, and the social situation. In addition, they sought to identify the best learning environments to structure engagement, cognitive practices, and conceptual constructs so that students will be successful in a situated atmosphere. Their work is a paradigm shift from the traditional understanding of learning where the individual internalizes educational material into their schema.

With situated learning, the learning process is unintentional and involves the context, the circumstances, and the environment in which the learning occurs. In order to explain situated learning, Lave and Wenger established the following as principals integral to the theory: a Community of Practice (CoP), Legitimate Peripheral Participation (LPP), and Cognitive Apprenticeship.

Community of Practice (CoP)

The community of practice is a group of people who learn together and embody the community's own set of values, artifacts, tools, language, and behaviors. In order to be a CoP, the community has three primary tenants: a community of learners, a domain knowledge, and a practice. Community members will discern themselves from other people who are not part of the domain. The CoP always has a domain of knowledge that community members share and have internalized. Lastly, the practice of a community is an integral component of a CoP where practitioners have a shared knowledge base, tools, and experience within the discipline or practice. If you have created an environment where all three of these tenants can converge, you have facilitated a Community of Practice (Lave & Wenger, 1990). Since human beings are social, we typically belong to multiple communities of different practices.

The principal investigator's research considers a community of learners better describes the academic environment regarding a post-secondary educational institutions' environment to be a better description of the academic milieu in where many students with disabilities situated. According to Riel and Polin (2001), a learning community focuses on specific program outcomes and includes group goals, much of which can be identified by a program, project, or institutional model. The participating students will share a lot of the same experiences regarding their challenges in going to college and a learning community is another interpretation of a CoP.

Legitimate peripheral participation (LPP). In a community of practice, when a new member is brought into the practice, they become a legitimate peripheral participant who moves from the outer parts of the community, and as they learn, they become established as old-timers in the community. LPP is an essential mechanism to incorporate new learners into the community of practice. The old-timers educate the novices and start bringing them closer to

mastery so they become full members in the social-cultural practice of the community (Lave & Wenger, 1990). Regardless of the role, members acquire knowledge in the domain of the community practices. This participation creates a mechanism for artifacts, activities, identities, and the community's knowledge to be practiced by the old-timers while instructing the practice of newcomers. Employing a method called cognitive apprenticeship allows the newcomers to become journeyman.

Cognitive apprenticeship. Cognitive apprenticeship is an approach to enculturate new people into the community through social interaction, social activity, and social norms (Brown, Collins, & Duguid, 1989). An example of cognitive apprenticeship is when a professor in any given discipline instructs students on how to perform a task and brings students from the periphery to integrate them into the subject as a novice to journeyman and eventually, to a mastery of the discipline through authentic activity.

Authentic activity. It is imperative to bring a novice learner into the community of practice via the teaching of activities designed to help students gain insight into any given discipline (Brown et al., 1989). An authentic activity serves to instruct the students on the periphery so they acquire a starting point in the community and are introduced to the tools related to learning the discipline, further enculturating them into the community. For example, a professor of engineering uses mathematics, a tool of the discipline, to solve a problem, passing on to their students the cognitive tools needed to succeed while they practice an authentic activity related to practice of engineering.

Situated Learning Theory serves to establish that cognition and learning can not be separated in an academic environment as they required in the co-creation of knowledge in a learning environment (Brown et al., 1989). If educators ignore the fact that cognition and

learning are separate entities, the advantages of a situated learning environment, potential goals and knowledge creation, are lost. As the situated learning demonstrates, every environment of learning is unique community unto itself, and as related to this study, students with learning disabilities must be able to learn how to use collaborative social interaction to socially construct knowledge. In the social-cultural environment where situated learning occurs, understanding and employing metacognitive social learning strategies is imperative to a student's success.

Metacognitive Social Learning Strategies

According to Heyes (2016), metacognitive social learning strategies generate learning through social interaction across communities and culture. Social learning strategies are described as rules for successful modeling students that implement the best strategies and are valuable and adaptive adjustments to social learning when implemented correctly in a learning community. By using metacognitive social learning strategies, students with LD have to determine the right agents to model their behavior after in order to learn effectively (p. 210). These metacognitive strategies are employed unconsciously when determining to select the proper social agent to model (Heyes, 2016).

A student with LD has to apply their metacognitive ability to be able to adjust to the flexible environment to ensure they have chosen the right social agents to model in their learning community. The cognitive processes of the LD student as suggested by Heyes (2016) are domain specific with conditions to know and understand when engaging in social learning and when choosing the person to learn from. When involved in a social learning activity, a student with LD chooses to ask for help, having determined to use their metacognitive ability in a social learning environment.

Gaps in the Literature

The literature regarding metacognition and the community college environment is lacking and the findings of this study can help to fill that gap. There is a lack of literature on how students with LD acquire metacognitive awareness without any formal educational strategies to facilitate their learning of these skills. There was not much literature found regarding the community college and the direct instruction of metacognitive skills or self-regulation of learning. There is a lack of literature where a student's voice informs the researchers on how they learn metacognitive skills to regulate their learning experiences. The findings of this study can be used to fill the research gaps, inform the practice of instructors and instructional designers, and provide an opportunity to hear from those who have been identified as benefitting the most from metacognitive training, students with learning disabilities.

The literature review identified our main elements of metacognition: metacognitive knowledge; metacognitive experience; metacognitive regulation; and metacognitive awareness. Each one of these elements affects the learner in different ways to solidify their learning experiences while assisting them in recognizing both their learning strengths and learning limitations. These elements of metacognition are essential to the learner's ability to be successful in the postsecondary setting.

Addressing the Gaps in Literature

To address the gaps in the literature regarding metacognition and its impact on the learning of students with cognitive disabilities, this study seeks to measure the level of metacognitive ability of college students who are academically successful in the California community college setting. For students who demonstrate metacognitive awareness, their voice is used to learn how they acquired metacognition and employed its practice in the educational

environment. The use of a validated measurement tool is the first step to identifying those students who have gained metacognitive awareness. For the purposes of this study, the researcher used the metacognitive instrument the Metacognition Awareness Inventory.

Metacognition Awareness Inventory Measurement

In past studies mentioned earlier in this chapter researchers have not differentiated between college level students who are clearly operating at a metacognitive level versus students who have not acquired metacognitive ability. In order to properly identify college level students who have acquired metacognitive ability the researcher has employed the Metacognition Awareness Inventory measurement instrument as a way to differentiate between students who have acquired metacognitive ability and those who have not. This is where the metacognition awareness inventory assisted the researcher in separating the students who have acquired metacognition so that the study participants could be identified for the research study.

Instruments and validation. The survey instrument chosen for this study is the Metacognition Awareness Inventory (MAI; Appendix C), designed to assess a person's metacognition awareness. The MAI was created by Schraw and Dennison (1994) with a two factor model that measures metacognitive awareness, knowledge of cognition, and regulation of cognition. The instrument uses a 52 item inventory survey of true/false statements, such as "I asked myself periodically if I meeting my goals." The MAI survey has been administered to both adolescents and adult learners, and has been validated as a reliable instrument. The MAI has been validated with the coefficient of .93 knowledge of cognition and .88 regarding the regulation of cognition (p. 371).

The 52 items of the questionnaire are divided up into two areas integral to metacognitive awareness: the knowledge of cognition and the regulation of cognition, both of which are further

broken down into subsets. The subsets of knowledge of cognition are strengths, weaknesses, knowledge, and strategies. The subsets of regulation of cognition are, planning, information management strategies, comprehensive monitoring, debugging strategies, and evaluations. Once the participant completed the questionnaire, their scores were added up and applied to the individual subsets of metacognitive awareness. The sum was converted to a percentage, resulting in a quantitative measurement of the participant's knowledge of cognition and regulation of cognition. This validated tool allowed the researcher to identify the best candidates to participate in the research study.

Student Voices

The objective of this phenomenological study is to hear from students themselves about their lived educational experiences. Too often pedagogy is based on statistics and other quantitative data to identify best teaching practices or to inform on methods which lead to measured success as attributed to quantitative goals. However, learning has components that are qualitative in nature: was the material engaging; was the classroom suitable for learning, what aspects of the learning experience were positive or negative for the learner. “For the majority of students with learning disabilities, the process of formal education is often negative and unsuccessful (M. Becerra, personal communication, April 21, 2018).”

Acknowledging and recording the experiences of this student population could serve to inform the practice of current and future educators by giving credence to the teaching methods that work for them. Acknowledging what the students identify as effective compensatory techniques, instructors can employ those techniques and support the student's success in assigned tasks, building self-confidence and self-determination in how they learn (NCWD, 2012). Positive learning experiences where students with LD are able to demonstrate their

knowledge will also lead to the development of skills students can use academically and professionally. Hearing the students' voices will give teachers practical ideas to use to engage students in the metacognitive process and help them build an increasingly positive framework for learning.

Summary

This chapter provided a historical perspective on the instruction and implementation of special education in the K-12 system and the mandates for equitable educational access in the postsecondary setting. The literature review found students with LD both lack and are in great need of metacognitive skill sets that can help them be academically successful. A description of the Disability Support Programs and Services present on all California community colleges provided a background on the varied supports available to students with disabilities, including access to assistive technologies and educational assistance classes designed to address the learning needs of this student population. Education assistance classes are often created to include educational strategies that help student learn how to successfully navigate academic tasks.

This chapter provided an introduction to metacognition, including the four components needed to become metacognitively proficient: metacognitive knowledge, metacognitive experiences, metacognitive awareness, and metacognitive regulation. Metacognitive learning strategies discussed the importance of teaching metacognition, strategic learning content, compensation strategies, and metacognition cognitive tools. It was important to address why students with LD need metacognition as well as the importance of hearing from the students' perspective how they use metacognition to become successful students.

This section included a review of situated learning theory and its four tenets: community of practice, legitimate peripheral participation, cognitive apprenticeship, and authentic activity. This theory serves to bolster the importance of learning effectively through socialization of practice in a specific situation or learning environment, much like that of metacognition. Metacognitive learning strategies was discussed given its foundation in social learning theory and practices, as well being bridge to the use of metacognitive awareness as a tool for the academic success of students with LD.

This section dis reveal that there are gaps in the literature regarding metacognition in the community college, the instruction of metacognitive skills, and the instruction of metacognitive skills to students with LD. To address this gap, the researcher identified a validated tool, the Metacognition Awareness Inventory (MAI) to assess metacognitive awareness in students. To address the gap in literature regarding the perspective of students, the researcher designed this study to specifically solicit form students with learning disabilities how they acquire metacognitive abilities and use those abilities to be successful in the college environment.

Chapter Three: Study Design

The California Community College (CCC) System has 114 campuses and is the largest educational system in the world, serving more than one in 12 students with disabilities nationwide. Through state and federal disability rights laws, it is mandatory for students with disabilities to receive equitable access to higher education as their peers without disabilities. The CCC's Disabled Student Programs and Services (DSPS) department is tasked with this responsibility at the majority of campuses in the system. Among the supports offered by this program are educational assistance classes offered explicitly for students with learning disabilities. However, these classes are not be designed with the inclusion of frameworks that are based on either a learning theory or empirical data, both which can help to inform the curricula.

Guiding Central Research Questions

To inform students, faculty, and scholars with this study, the researcher asked the following question to students who obtained a score of 70% or higher on the Metacognitive Awareness Inventory (MAI): To what do students (you) attribute their acquisition of metacognitive awareness?

Personal Disclosure of the Researcher

The researcher of this study has a long personal and professional history working with students with disabilities. The researcher was diagnosed with a learning disability (LD) when he attended primary school and has successfully navigated an educational system that was not designed for him. Because of his lived experience as a student with disabilities, the researcher has an intimate understanding and empathetic view of the struggles students with disabilities face as they encounter their formal education. The researcher has extensive professional experience

teaching students with disabilities to use cognitive tools, utilize academic accommodations, and to access their coursework. His experiences as a community college student and a community college educator working almost exclusively with this student population may provide him a unique insight into how to best support them academically.

Design of the Study: A Phenomenological Approach

The phenomenological approach is used to examine how students with learning disabilities (LD) acquired metacognitive ability, skills, and strategies to become successful California Community College students. The researcher used a published and validated measure of metacognitive skills to identify the participants who acquired functioning at or above a 70% with regard to strategic use of metacognition. This measure is described and discussed in greater detail in chapter two, page 46.

Students who qualified were invited to participate in an interview with the researcher. Interviews were transcribed and entered into HyperResearch for coding and analysis. The researcher relied on a general inductive approach to coding, which determined the manner that the emergent themes were identified during the coding process. The emergent themes were analyzed to answer the guiding research question with the participants' own words.

In aforementioned research, the authors did not differentiate between college-level students who are clearly operating at a metacognitive level and those students who have not acquired metacognitive ability. With the MAI instrument, the researcher of this study was able to differentiate between these two types of students. Once, the researcher employed a purposeful sampling method to select interview participants, the interview was administered to those participants who qualified with the 70% score on the MAI. The measurement instruments used for the interview process and the coding rubric had to be developed by the researcher.

Population and Sample

For the purpose of this research, the principal investigator employed a phenomenological approach, an approach that provides an understanding that a person who has lived through an experience and is thus qualified to relate their experiences accurately from their viewpoint (Gray, 2013). The population for this study included all college students with a verified learning disability registered with a California community college DSPS.

For this study, the researcher contacted two California Community Colleges one in Northern California and the other one in Southern California. The two institutions agreed to use Pepperdine's IRB protocol which allowed administrators and faculty members to contact students on behalf of the researcher and ensured students' anonymity. The email letters used to solicit student participation included a question asking participants if they were selected after taking the MAI would they be willing to participate in the interview portion of the research study, enabling the researcher to identify a pool of eligible participants.

The Dean of Student Support Services and the Coordinator of DSPS emailed a letter to solicit participation (Appendix A) and obtained a signed consent form (Appendix B) from students who met the following criteria:

- 1) Were currently enrolled at a California Community College;
- 2) Have a verified learning disability as defined by the designated DSPS;
- 3) Were 18 years or older;
- 4) Had a cumulative GPA of 2.0 or higher;
- 5) Had a minimum of 45-semester units completed;

6) Were on course to graduate from a California Community College within two semesters;

7) Or had graduated from the California Community College in the previous 12 months.

The criteria above assured that participants had a broad enough community college experience to have developed a level of metacognitive ability to participate in the research. The criteria was also based on California state education code defining academic success in community college, the minimum requirements for an Associate's degree, and the mandates of newly implemented programs.

The researcher used a purposeful sampling technique to select those participants who demonstrated metacognitive awareness based on the findings of the MAI survey. The principal investigator compiled open-ended questions designed to understand how students with LD had acquired metacognitive awareness. The researcher created an interview protocol with questions based on the results of the literature review. The participants who obtained a minimal score of at least 70% on the MAI were invited for the interview portion of the study. (If no student scored 70% on the MAI survey, then the researcher would have interviewed the top five participants and analyze their responses to determine why the participants did not reach the 70% score).

Initially the questionnaire was distributed to 36 students from the identified sample group. Since the survey pool was considered too small, the principal investigator reached out to several California Community Colleges located throughout California, resulting in an increase from 36 participants to 78 participants. The original protocol was employed for face-to-face interviews and recorded everything with a Smartpen and a digital audio recorder.

By adding other California Community College to the research study, the principal investigator incorporated different technologies to distribute the surveys and to capture

subsequent interviews from a distance. Some of the participants were located more than 200 miles from the researcher, so the researcher utilized the audio/visual technology tool Zoom, a web-conferencing software used in academia for distance education courses, to enable participants in interviews via the internet.

Ultimately, the researcher selected six participants based on their survey results and conducted face-to-face interviews and distance interviews. As with all the interviews, the audio was recorded and the recordings did not contain any identifying information or IP addresses to ensure the participants' identities were secured and protected.

Survey Participants

Ultimately, there were ten participants out of 78 participants who were eligible took take the MAI survey comprised of nine women and one man of which seven were Caucasian and three were Latinos. The age range for the ten participants was 22 years to 36 years of age. Furthermore, this group of ten participants scored a combined 64.12% on a percentage of Knowledge about Cognition, the percentage of Regulation of Cognition the group scored 69.14% for a total combined percentage score of 67.5% which is 2.5% percentage points below the cut off percentage of 70% on the MAI survey.

The Metacognition Awareness Inventory Survey is a 52-question survey that is broken up into two main categories of metacognition: Knowledge about Cognition and Regulation of Cognition. Each of these categories has subsections attached to them. Knowledge about Cognition's subsections are Declarative Knowledge, Procedural Knowledge, and Conditional Knowledge, and 17 MAI items correlate with each one. The results found 64.12% of all the participants surveyed in this research study had knowledge about their cognition. Regulation of Cognition subsections are Planning, Information Management Strategies, Comprehensive

Monitoring, Debugging Strategies, and Evaluation. Thirty-five inventory questions correlate with these subsections. Ultimately 67.50% of those surveyed did not meet the criteria to pass to the interview phase which was score of 70% or above on the MAI.

Table 2

Total Percentage of all Participants

Category	<i>N</i>	Range	Minimum	Maximum	Mean	Std. Deviation
What is your Age?	10	14	22	36	29.60	4.624
Declarative Knowledge	10	7	0	7	4.80	2.201
Procedural Knowledge	10	4	0	4	2.80	1.229
Conditional Knowledge	10	5	0	5	3.30	1.494
Planning	10	7	0	7	5.30	2.214
Info Manage Strat	10	10	0	10	6.60	2.716
Comprehensive Monitoring	10	7	0	7	4.40	2.319
Debugging Strategies	10	5	0	5	4.40	1.578
Evaluation	10	5	0	5	3.50	1.650
Cognition Knowledge	10	16	0	16	10.90	4.606
Regulation Cognition	10	34	0	34	24.20	9.716

Continued

Category	N	Range	Minimum	Maximum	Mean	Std. Deviation
Percentage of Knowledge about Cognition	10	94	0	94	64.12	27.091
Percentage of Regulation of Cognition	10	97	0	97	69.14	27.760
Total Percent	10	.96	.00	.96	.6750	.27021

Respectively, there were six participants of the original ten that met the survey criteria of 70% and their metacognition numbers improved significantly without the inclusion of the four participants who did not meet the interview criteria. The average of the scores for the six participants who met the criteria were 79.14% in Knowledge about Cognition and 83.81% in the percentage of Regulation of Cognition, calculated to the overall total percentage of 82.37% for being metacognitively aware. The six participants as a group have established that they have acquired metacognition ability and were thus selected for an interview for research study.

Table 3

Total Percentage of Participants Who Met Interview Criteria

Categories	N	Range	Minimum	Maximum	Mean	Std. Deviation
What is your Age?	6	14	22	36	29.17	5.231
Declarative Knowledge	6	2	5	7	6.00	.894
Procedural Knowledge	6	2	2	4	3.33	.816

Continued

Categories	<i>N</i>	Range	Minimum	Maximum	Mean	Std. Deviation
Conditional Knowledge	6	2	3	5	4.17	.753
Planning	6	2	5	7	6.33	.816
Info Manage Strat	6	3	7	10	8.00	1.265
Comprehensive Monitoring	6	3	4	7	5.50	1.225
Debugging Strategies	6	0	5	5	5.00	.000
Evaluation	6	1	4	5	4.50	.548
Cognition Knowledge	6	4	12	16	13.50	1.643
Regulation Cognition	6	9	25	34	29.33	3.141
Percentage of Knowledge about Cognition	6	24	71	94	79.41	9.666
Percentage of Regulation of Cognition	6	26	71	97	83.81	8.975
Total Percent	6	.23	.73	.96	.8237	.08550

Final Sample Demographics

Out of the six participants who were asked to be part of interview process, one participant chose not to be interviewed for the research project while the other five were selected and were interviewed for the research study. Below is a demographic chart of those who provided interviews.

Table 4

Demographics of Interview Participants

Participant	Age	Gender	Race	% on MAI survey
Participant 1	22	Female	Latina	96%
Participant 2	30	Female	White	85%
Participant 3	36	Female	White	79%
Participant 4	34	Female	White	87%
Participant 5	27	Male	White	73%

The five participant demographics were one male and four females, ranging in ages between 22 and 36. Four out of the five participants are White and one is a Latina. Three out of five participants were transferring to a four-year university this year (2018) or in the near future. Two out of the five participants are in vocational disciplines seeking employment as soon as they graduate from their academic programs. All five participants worked while going to school; two of them were working mothers juggling family, work, and school responsibilities. Each participant reported using accommodations to mitigate their learning challenges.

The Stigma of Being Identified as Learning Disabled

A challenge to conducting this research was during the interviews as these students often have difficulties discussing their experiences. When a person has been identified as having a learning disability, several things may happen to that person, including stereotyping and being excluded from activities found in the traditional community. Stereotyped manifest itself as the traditional group is identified according to negative characteristics or differences associated with an inferior group (Green, Davis, Karshmer, Marsh, & Straight, 2005). The stereotypes traditionally related to this student population is the student is dumb, stupid and deficient (Green et al., 2005). In some instances, students start to withdraw within themselves and consciously

start separating themselves from the mainstream groups, as actions by other people are considered humiliating and disparaging. This can lead the student with LD to internalize the stigmatization of the negative characteristics of being a student with a disability.

The researcher has discussed student with LD stereotypes and separation from the mainstream group with his colleagues, and one community college LD specialist shared, “some of my students have a hard time asking for accommodations and do not like being associated with DSPPS program and services (M. Becerra, personal communication, 04/21/2018).” She further related how stigmatization manifests into students not utilizing specialized supports or accessing their academic accommodations. This stigmatization of disability further impedes the progress of students depending on their learning experiences with their peers without disabilities, their instructors, and other academic professionals.

This student population experiences many years of difficulty in the K-12 environment due to their learning, constantly reminded about their educational limitations. By the time they arrive at the community college, these students are rarely interested in in-depth discussion about their cognitive deficits or reliving the experiences to describe overcoming educational barriers. “We just want to be treated like other students are treated (Q. Martinez, personal communication April 20, 2018).” This may explain why the interviews were brief and to the point, leaving limited content to choose when using the students’ voices to describe their experiences.

The principal investigator of this research himself has a learning disability and understands all too well what the research participants have gone through to be successfully academically. His intimate knowledge of the traumatic experiences that may have occurred in a student with LD’s academic life made the principal investigator is mindful of what he asked the interviewees and respected the brevity of their responses. Because of his experience with

stigmatization, the researcher went to greater lengths to protect the anonymity of the research participants by limiting any identifying characteristics that served no purpose for the research, i.e. specificities of their personal backgrounds, where they were attending school, etc. The importance of hearing their experiences outweighed the need to go into in-depth descriptions of the final interviewees.

Protecting survey participants. The list of participants and the email addresses of the participants are kept in a locked room in a locked file cabinet and will be housed there for five years after completion of the study. The survey application used for the research study was Qualtrics, a tool currently being used by Fortune 500 companies that utilizes industry standard protocols for security designed to keep participant data safe. Qualtrics technology included restricted access protocols inherently built into the software, verified by the researcher with the creators of the application. The data imputed into Qualtrics is housed on a secure server that only the researcher can access.

Protecting interview participants. The policies and procedures outlined by Pepperdine University's Institutional Review Board (IRB) were adhered to for this study. The IRB approval was accepted at each all institution selected for this study. The study participants and participating college sites will remain anonymous as the researcher used pseudonyms for both. All interviewees were identified by a pseudonym and all transcriptions and identifying information was secured using the security protocol previously discussed in this chapter.

Although this research project posed minimal risks to the participants, one risk to the participants was being identified as having LD. The researcher understood the discomfort a student may have felt while talking about their disability, thus steps were taken to reassure all

participants were interviewed in a controlled and safe environment. The researcher reiterated that participation was voluntary, and the participants could opt out anytime during the process.

Instrumentation

Chapter two, the literature review, discussed several research studies where the researchers hypothesized solutions regarding how to ameliorate the cognitive deficits of students with LD without asking the students themselves if these solutions would positively impact their cognitive issues. The primary purpose of this research was to listen and understand the voice of the LD student themselves. The principal investigator designed an interview protocol that solicited information directly from the LD students to capture their lived experience.

Interview instrument. The researcher using a priori categories that emerged from the literature review developed the interview protocol utilized in the study. The interview instrument was designed to solicit answers from LD students in the effort to understand how they acquired metacognition. Six main categories of metacognitive skills were found in the literature and discussed in depth in chapter two of this document: metacognitive knowledge, metacognitive experiences, metacognitive awareness, metacognitive regulation, compensation strategies, and cognitive tools. Each one of these included a detailed and rich description that was explored in chapter two of the literature review (p. 20–37). The researcher used these categories to create a rubric to code the participant's interview responses.

All of the questions used in this research study were semi-structured to allow the principal investigator flexibility during the interview process. The design of the instrument had a main question that focused on the a priori category and included a subsection question for follow-up. The researcher did not ask every participant every follow-up question because the interviewee sometimes led the interview into areas where the follow-up questions did not apply.

The researcher understood to get deeper, richer information from the interview; the process had to take its course to identify what would emerge. Table 5 below lists the metacognitive categories from the literature along with the interview questions and prompts that were used in this study.

Table 5

Metacognitive Categories and Interview Questions

Category	Interview Questions
<p>Metacognitive Knowledge</p> <p>Knowing and understanding how to interact with your environment given variables that may or may not change the outcome of the cognitive domain (p. 26).</p>	<p>1. Tell me about time when you didn't understand an assignment or task and what you did about it?</p> <p>a. How did you learn to do these things?</p>
<p>Metacognitive Experiences</p> <p>An activity that is germane to any intellectual endeavor directly affects one's knowledge regarding that activity (p. 27).</p>	<p>2. Tell me about a time when you made a mistake or got confused on an assignment.</p> <p>a. Who did you ask for help?</p> <p>b. How did you learn to do these things?</p>
<p>Metacognitive Awareness</p> <p>The learner's ability to be aware of how they think (p. 27).</p>	<p>3. Choose a recent task at school. What are some things you did or thought about before you began?</p> <p>a. Strategy?</p> <p>b. Plan?</p> <p>c. How did you learn to do these things?</p>
<p>Metacognitive Regulation</p> <p>Helps the learner to reflect, monitor, and plan what they have learned (p. 28).</p>	<p>4. In what ways do you monitor your progress while working on an assignment?</p>

Continued

Category	Interview Questions
Metacognitive Cognitive Tools As a computer application, tools that share some of the cognition and help facilitate the construction of knowledge in any discipline that a college may offer (p. 37).	<p>a. How did you learn those strategies?</p> <p>5. In what ways do you monitor your progress while working on an assignment?</p> <p>a. How did you learn those strategies?</p> <p>6. What are some things you do or think about before turning in your work?</p> <p>b. How did you learn those strategies?</p> <p>7. Do you think about how you can use what you have learned in the future?</p> <p>8. In what ways do you use assistive technologies?</p>

Pilot Interviews and Interview Script Modifications

The interview instrument was checked for validity by two different students and one of the researcher's colleagues. A student was interviewed but did not take part in data collection checked the validity of the interview instrument and assisted in the refinement of the interview tool. One of the participants who took the survey but did not qualify for the interview process was asked to volunteer to be interviewed to check the validity of the interview instrument. This interview took approximately 20 minutes to complete.

Through this validation process, the researcher discovered problems with the interview instrument and revised the interview questions to solicit the information needed to answer the guiding research question. The original interview questions were confusing, and the interview participants did not understand what was being asked of them. In addition, there were follow-up questions built into the interview protocol that confused participants instead of clarifying the

original questions. In particular, questions two and three went into a sub-question resulting in the interview participants not understanding the central question being asked of them.

The solution for clarifying the interview questions was to revise them in a format that was clear and understandable. The researcher separated the follow-up questions from the central questions and revised them into their current form. After the researcher acquired assistance from his dissertation committee chair to redesign the interview questions, the researcher sought out another student with a disability which manifested much like LD but who did not meet the criteria of the research study. This student volunteered to be interviewed and the revised interview questions were administered. This interview took approximately 22 minutes to complete and resulted in an instrument which led to satisfactory results. The researcher decided to use the revamped questions and started collecting interview data from participants who had taken MAI survey and qualified for the interview.

Data Collection Procedure

Interviews took place over an eight-week period in the winter of 2017. Three participants were interviewed face-to-face on their campus; due to distance, two others were unable to meet face-to-face and were interviewed over Zoom. The duration of the interviews varied greatly, the shortest interview lasted 12 minutes to the longest lasted 46 minutes. All of the interviews were digitally recorded for transcription. The principal researcher used a third-party transcription service named REV to transcribe all five interviews from an MP3 audio file to a Word document. The transcription of the interviews was entered into a HyperResearch project file for coded and theming.

The researcher utilized a general inductive approach the purpose of which was “to allow research findings to emerge from the frequent, dominant, or significant themes inherent in raw

data, without the restraints imposed by structured methodologies (Thomas, 2006, p. 238).” The researcher waited until all five interviews were completed to do a read through and an analysis of the participants’ interview responses. This allowed the researcher to get familiar and comfortable with the interview process and gain greater insight from each participant’s interview.

After the initial reading of a transcript, the researcher read it for a second time using a priori categories to discover emergent themes and confirm those themes as being. The researcher used HyperRESEARCH software to code all five interviews using the a priori and emergent themes rubric created to markup each interview and place the interview participants’ words in the specific categories created for this research project. HyperRESEARCH software is designed so researchers can annotate interviews into categories and subcategories deemed important to their research.

The rubric the researcher used in this study was called the metacognition codebook, an instrument used to understand interview responses. The instrument was constructed by using a priori categories directly taken from the literature review. The principal investigator read the transcripts and identified emerging themes discovered from reviewing participant responses and transcripts. The researcher then included the participants’ own words to complete the metacognitive codebook.

As stated earlier in this chapter, the researcher read through the interviews using a priori categories, that were aligned with the interview questions (see Table 4). The researcher built the metacognitive codebook to annotate the interviews with the appropriate code. Six of the nine categories are in line with the literature that the researcher reviewed. After the initial review of interview revealed, three emergent themes which were added to the metacognitive codebook:

How Students Learn Metacognition, Technology Other Than a Cognitive Tool, and DSPS. Once all categories were identified, both the a priori and the emerging themes needed a detailed definition of the category they were assigned to. The a priori categories used the definition from the literature reviews and the metacognitive codebook was aligned with all parts of the research project to obtain the best results from the interview participants and get the best results for the research project.

Finally, the researcher used quotes directly from the participants' interview responses by reading the interview transcripts for a third time and selecting exemplar quotes that represented the definition of the category. The category definitions and the participant's quotes were aligned so the researcher could employ HyperRESEARCH software to markup and annotate the transcripts and do a deep analysis to find correlating themes to answer the guiding research question.

Table 6

Metacognition: Coding Book

Category	Definition	Participant Quotes
Metacognition Awareness	Metacognition awareness is the ability of a student to understand what they have learned and apply a new skill set (p. 27).	I definitely know where my cognitive defects are and I know that my weaknesses are not weaknesses unless I don't do anything about it.
Metacognitive Regulation	Metacognitive regulation helps the learner to reflect, monitor, and plan what they have learned (p. 28).	I have to read the question out loud, and I find that that helps because it's me taking my time.

Continued

Category	Definition	Participant Quotes
Metacognitive Knowledge	Metacognitive knowledge is knowledge learners gain via the tasks they undertake and the learning strategies they use during the academic task (p. 26).	I've learned that with math, it's helpful to go to study sessions. And that helps with the long term memory because of experiencing conversations that you have with other students, and it's more interactive, and I find that you are most likely to remember a concept when there's that interaction with other students, and it's just making a memorable moment.
Metacognitive Experience	Metacognitive experience is when an activity that is connected to any academic effort directly affects one's knowledge regarding that activity (p. 27).	I have to do something about my weaknesses so that's why I've created strategies that I understand and I stick with them, and so I just find the strategies to overcome those weaknesses so that I can excel in whatever I do.
Metacognition Compensation Strategies	Note-taking strategies, library skills, time management, and test taking preparation (p. 37)	I just needed to know what strategies work best for me. Like note taking has really helped in that process. Recording so that way, just hearing the way a professor explains something rather than reading the definition in a book is a strategy. Like it's understanding and remembering how they said it, and so recording helps a lot.
Cognitive Tools	A computer application that shares some of the cognition and help facilitate the construction of knowledge in any discipline that a college may offer. (p. 36)	Recording so that way, just hearing the way a professor explains something rather than reading the definition in a book is a strategy.

Continued

Category	Definition	Participant Quotes
How Students Learn Metacognition	How participants learn metacognition as stated in interviews.	I learned here at the counseling office when the LD Specialist] was doing all of my tests; she helped me pinpoint each cognitive defect.
Technology Other Than a Cognitive Tool	Technology such as the Internet, smartphones, and any other digital device used for learning.	I usually read blogs sometimes. I read a lot of blogs. I think technology helps a lot with that.
DSPS	If the participant references Disability Support Programs and Services (DSPS).	I did learn though about myself was from DSPS, I wanted to say that because I didn't even know I had a learning disability until I came to college.

The methodology used for this research project was a phenomenological approach to understand the lived experience of California Community College students with LD and how they acquire metacognition. The data collection process used a semi-structured interview protocol to get answers from the research participants and a general inductive approach was used to further analyze participant responses. Both approaches helped provide more depth and understanding of the phenomenological experience of the participants of being a California Community College student with LD.

The researcher developed a measurement instrument crucial for the gathering of the data needed to answer the guiding research question. The interview utilized a priori categories aligned with the literature review and a check for validity of the interview protocol was completed by conducting pilot interviews to make sure of the reliability of the instrument.

Furthermore, the metacognition codebook was developed and used to annotate participant responses leading to coding of emergent themes to discover how these students acquire metacognitive abilities.

Chapter Four: Results

The interview process of the research study analyzed the interviews using a general inductive approach and both a priori and emergent themes were examined. This analysis provided answers to the guiding research question using the voice of community college students with disabilities.

Restatement of the Guiding Research Question

In order to use the findings of this study to inform students, faculty, and scholars the researcher asked the following question regarding students who obtained a score of 70% or higher on the MAI survey: to what do you attribute your acquisition of metacognitive skills and abilities?

Interview Analysis

To ensure the anonymity of the participants who were interviewed for this research study, the researcher chose to give all participants pseudonyms to protect the identities of those students who volunteered to participate. The pseudonyms also served as a way to assure participants that the data derived from their participation could not be traced back to them individually, especially given their willingness to share on such an intimate level their educational experiences.

The code frequency table represents the number of times a particular code was used by the researcher, as well as the average number of times the researcher used a particular code across all five interviews. The HyperRESEARCH software, in conjunction with the metacognition codebook, helped the researcher identify codes and themes, and analyze responses. The principal investigator used the software to code the participant's interviews below shows the frequency report generated from the coding process.

Based on the frequency report (see Table 7), three distinct groups were identified from the coding report. Each of the three groups contain specific codes. The first grouping,

metacognitive regulation, compensating strategies, and metacognitive experience, was prevalent throughout all five interviews. As coded by the researcher, metacognition regulation had a frequency rate of 68 times, suggesting that the participants understood and realized their metacognitive ability. The next highest code was compensating strategies with a frequency rate of 48 times throughout the interviews, a 20-point difference from metacognitive regulation. This finding indicates that participants understood the metacognitive regulation enough to employ compensating strategies to overcome their cognitive deficits to become successful students.

Lastly, all five participants were aware of their metacognitive experience which was indicated by the frequency rate of this code which was 37 times within the interview responses. This was a 19 points difference from metacognitive regulation. This frequency demonstrates that the participants understood how to take advantage of their academic environment in order to accomplish the best results by using the previous two strategies to address cognitive challenges.

The middle grouping included how students learn metacognition and metacognition awareness, with frequency rates of 28 times and 26 times, respectively, found through all the interviews. While metacognition awareness showed up in their responses of four of the five interviewees, one of the participants, PG, stated she never had any recognition of metacognitive awareness. This indicated to the researcher that this student demonstrated the ability to monitor and regulate her metacognitive regulation and experiences, but never mentioned how aware she was of her ability.

The third code group was technology other than assistive, cognitive tools, metacognitive knowledge, and DSPS; each had the lowest frequency rate among the interview responses. A span of five points separated the first code in this group from the last, the span of which was a frequency rate between 16 and 11 times. The researcher contributed the frequency of technology

other than assistive and cognitive tools (frequency rates 16 and 14 times, respectively) as technologically related. Four out of five participants stated they used some type of technology. One interviewee, SG stated that she used Kurzweil, a cognitive tool, for her academic work and did not comment on any other technologies. Four out of five participants stated they used cognitive tools to be successful in the classroom. One student, TH, stated that he liked old-school pen and paper versus using assistive technology.

The code, metacognition knowledge, had a frequency rate of 13 times with four out of five interviews coding for this category. There may be several reasons why this category had a low-frequency rate. For example, CM did not explicitly state enough evidence in the interviews for the researcher to code for this element in his interview. Secondly, there is a possibility of the interview question that addressed metacognition knowledge may not have been clear to the participants especially CM.

In the second next half of this section, the researcher analyzed the interviews in-depth to understand better the acquisition of metacognition and the first category the principal investigator sought was metacognitive regulation.

Table 7

Code Frequency

Code	Frequency	Min	Max	Mean	Std Dev
Metacognitive Regulation	68	7	30	13.6	9.555
Compensation Strategies	48	4	16	9.6	5.55
Metacognitive Experience	37	3	11	7.4	2.88
How Students Learn Metacognition	28	3	7	5.6	1.673

Continued

Code	Frequency	Min	Max	Mean	Std Dev
Metacognition Awareness	26	0	15	5.2	5.762
Technology Other Than Assistive	16	0	10	3.2	3.962
Cognitive Tools	14	0	10	2.8	4.147
Metacognitive Knowledge	13	0	8	2.6	3.209
DSPS	11	0	5	2.2	2.168

Metacognitive Regulation

Metacognitive regulation helps the learner to reflect, monitor, and plan what they have learned, and it includes three components that facilitate learning: planning, monitoring, and evaluation. Metacognitive regulation was the most talked about category among all five participants with a frequency response was 68 times throughout all five of the interviews. One strategy all participants discussed was monitoring their academic tasks and keeping on track.

CM stated:

I make lists. Lists work for me. (L)ike, if I have everything up in my mind, I feel overwhelmed. There is just so much going on up there. So, if I write it out in a list form then, okay, I have chapter one, four questions. Do that, check it off.

Responses to the related interview questions showed that being a successful student with LD requires organization and planning, which PG did exceptionally well. She further stated:

Again, just keeping it organized. I have notebooks for each class; I highlight everything, I make notes for everything. This class, actually, he has it where everything's got a bulletin with it, and I print it out, and I check it off as I go. The calendar, I print it off, I highlight it as I'm done so that I can watch the progress that I'm making through the class.

In addition, the participants evaluated their completion of academic tasks and related coursework often. MM talked about her cognitive defects repeatedly in the interview and felt she was always evaluating her strategies and tasks along with her cognitive deficits in mind. MM knew how to

adjust strategies, so she could overcome her weaknesses and become a successful student. She shared:

I definitely know where my cognitive (challenges) are and I know that my weaknesses are not weaknesses unless I don't do anything about it. So I have to do something about my weaknesses so that's why I've created strategies that I understand and I stick with them... (S)o I just find the strategies to overcome those weaknesses so that I can excel in whatever I do.

These answers were typical of what the literature stated about people with disabilities and metacognitive regulation. Also, metacognitive regulation was closely related to compensating strategies which all five participants talked about during their interviews.

Compensation Strategies

All participants in this research study created a list or had notetaking strategies in order to compensate for the cognitive weaknesses. According to Reis et al. (2000), successful students with LD used compensating strategies such as notetaking, library skills, time management and test preparation. In this study, the participants' responses were in line with the research data outlined in chapter two. TH stated, "(Either the strategies) were provided to me from the teacher or a lot of times I'll just create my own list of to-do's in order to make sure that the assignment is complete." SG echoed the same sentiment when she reported:

I do it every Monday or every Sunday right before I go (to class) Monday. I write down my to-do's for that week, and I think that's how I keep up with everything... I keep a school calendar, and I always break down my courses and my big to-do's in my classrooms, and I kind of color code on everything (based) on days of the week.

Audio recordings were also noted by the interviewees as a strategy used to overcome the cognitive challenges, assisting the participants in learning to adapt and overcome the learning barriers that faced them. MM reported:

I just needed to know what strategies work best for me. Like note taking has really helped in that process. Recording (helped by) hearing the way a professor

explains something rather than reading the definition in a book is a strategy. (It's understanding and remembering how they said it...so recording helps a lot.

Regardless of which compensating strategy was employed by the participants, the goal was to overcome cognitive barriers and limit their effects on learning. All of the participants employed successful compensating strategies to achieve academic success.

Metacognitive Experience

All five participants discussed metacognition experience a code that had a 37-time frequency rate throughout all five interviews. Metacognitive experience is when an activity that is germane to any intellectual endeavor directly affects one's knowledge regarding that activity (Flavell, 1979). CM communicated her metacognitive experience this way:

I ask questions before I turn it in. I'll ask my other classmates or even the instructor, professor, if something is right or if I am on the right track...(E)ven if it seems like the answer is right there and it seems like a super easy answer to a question, I still ask the question...(j)ust so there's complete clarity, there's no confusion, everything is out on the table.

While SG took the same approach by asking her classmates for help on assignments, she stated, "Sometimes I would ask peers in the classroom and see if they were having the same issue as me. Some of them were having the same issue as me, not understanding things fully." Finally, MM shared the experience of asking for help from her peers. She shared:

I usually get confused or make a mistake. I go to either another student and ask for help, like (from) someone that's nearby. Especially if it's a group project, I ask questions. It's like, 'Hey I didn't do well on this assignment. How did you solve it?' I ask how they do it. Or sometimes I'll go straight to the professor because I want to talk to them about how they did it.

All five participants chose to use peer-to-peer interactions to help them be successful in the completion of academic assignments and each mentioned asking their professors a lot of questions about individual assignments. SG made a pointed statement about questioning professors:

I was very persistent on contacting that instructor whether it was a face-to-face course or online course. I would not harass them, but I would ask them over and over in different ways to get (a) full understanding of what I was trying to get to.

Asking for clarification from instructors and their peers was a common thought process for these students with LD and helped them to grasp the concepts of the assignments their professors gave them. From all accounts of the participants' responses, clarification was a successful strategy for the LD student.

Metacognition Awareness

Metacognition awareness had a frequency rate of 26 mentions throughout the interviews, and four out of the five participants exhibited tendencies towards metacognitive awareness.

Metacognitive awareness is the ability of the learner to be aware of how they think. MM understood how she learns and applied it to all facets of her life. She reported "making strategies in my everyday life...(is) rooted in...know(ing) what my weaknesses are and setting time (limits) for things." While CM understood her study habits well enough to go against the norm and cram for her exams because she felt that strategy was best suited for her learning methodology. She commented, "I know what I need to study and (I'd) have all the information. But then I'll wake up early the morning of the test and as you would say, cram." For many students with learning disabilities, it is crucial for them to know themselves well enough to employ the best methods of their individual learning practices. That might be why SG found that she observed her classes to use the best strategies and what was required of her when she started a new class. She further reported:

It's different and it takes about two weeks into the course for me to kind of fully understand what I'm capable of in the classroom and what the instructors are expecting of you in the classroom and then what kind of work you'll be doing in the classroom.

LD students in this research study knew and comprehended their cognitive deficits well enough to be metacognitively aware of the skills they needed and how to employ them in a post-secondary education environment.

Metacognitive Knowledge

Metacognitive knowledge is knowing and understanding how to interact with the environment given that there may be variables that may or may not change the outcome of the cognitive domain one finds themselves doing at the moment (Flavell, 1979). Four out of five interviewees confirmed they had skills in metacognitive knowledge with a frequency rate of 13 times throughout all the interviews. MM supported this when she said,

I've learned that with math, it's helpful to go to study sessions and that helps with the long-term memory because of experiencing conversations that you have with other students and (because) it's more interactive... I find that you are most likely to remember a concept when there's that interaction with other students, and ...making (it) a memorable moment.

While TH made mistakes in the past and always checked for task completeness before he turned in any assignment. TH reported:

I like to go over (a) list while completing the assignment to make sure that everything is thoroughly completed and that I didn't miss anything. I've learned from past experiences that a lot of times if I don't make a list for myself, then I will miss small things here or there that could get deducted from my grade.

From their responses regarding metacognitive knowledge, the study participants have learned to make adjustments to the learning environment while simultaneously learning to navigate this same environment.

Technology

All participants in this research study talked about technology. In today's academic environment, technology is ubiquitous and should be used by every student, especially LD students. According to Fichten et al. (2014), most students with disabilities should use some

technology to facilitate their learning. For this study the researcher broke technology into two major categories when coding the completed interviews: cognitive tools and technology other than a cognitive tool.

Cognitive Tools were used by three out of five participants, as evidenced by a frequency rate of 14 in the interviews. Jonassen (1995) defined cognitive as “(a) computer application that shares some of the cognition and helps facilitate the construction of knowledge in any discipline that a college may offer.” Examples of cognitive tools are Kurzweil, Dragon NaturallySpeaking, and Smartpens and all participants in the study talked about technology. CM was explicit when she described how the Smartpen helped her academic pursuits:

The Smartpen was extremely helpful for my Microbiology class, (but it) didn't help me retain the information. But it was extremely helpful because I could go back to my notes at any time and review things that maybe I didn't write down on the paper but it was (recorded) on the pen.

Kurzweil is a major cognitive tool utilized by the interviewees to help them to read and comprehend their academic assignments. SG reported, “For almost every semester that I was able to use my Kurzweil, I used it almost every night on my books to get through a lot of reading and understanding of the lecture and the textbook.” In addition MM employed Kurzweil in an unconventional way, but still achieved the desired result of acquiring knowledge using a cognitive tool to enhance her learning. She further commented:

I think Kurzweil is just more of a convenience. It's very convenient because when I'm on my way to school, and I want to review some information from the test, I could listen to music or I could listen to Kurzweil...I review a chapter while it's playing on my phone...(Yes) I could use my phone for Kurzweil.

Furthermore, some of the study participants used cognitive tools to help them be successful in the classroom while others were very open to using technology other than cognitive tools for learning. During the coding process, an emergent theme appeared in the data and was

noted as technology other than a cognitive tool which had a code frequency rate of 16 times. These non-cognitive tools were utilized used by four out of five participants. Technologies other than a cognitive tool can be defined by mainstream technology, including the Internet, smartphones, or any other device used to support learning. Students with learning disabilities in this study seemed to adapt to the challenges of their cognitive weaknesses with creative solutions to their learning needs. For example, MM watched YouTube videos to help her study for chemistry in her interview. She commented:

I didn't understand what my professor was talking about and I had no access (to the teacher) over the weekend, so I just reviewed YouTube videos that would help me understand a bit more on the homework I was doing...(It was very helpful for chemistry because I would just use YouTube which is a form of the internet.

Two participants preferred to use smartphones to assist them in their academic learning. PG and TH often solicited information through the use of their smartphones. PG reported:

I actually use my phone and I talk to text into notes, email it to myself...(T)hen I copy and paste it into Word because sometimes I get a little slow getting something typed out, especially if I'm getting close to a deadline...(T)hat actually helps me a lot.

TH added that he employs his smartphone to make sure words are spelled correctly by using Google. He further commented, "I use my smartphone to Google things, to Google words. I'm always looking up words and trying to make sure I'm spelling correctly." Finally, both TH and CM preferred to do things 'old school', preferring to do things with pen and paper instead of using technology. CM reported:

I have a computer and I use it obviously for school to write papers and (do) research. Honestly, I hate technology. I really do... I write all my papers out. When my professors or instructors ask me to type a paper I...cringe...(b)ecause...I enjoy writing.

Although TH did not show as much disdain for technology as CM, he still had his preferences on the use of technology. TH stated in his interview, "I'm kind of old school. I use

pen and paper, and that's worked for me. I honestly have not used assistive technology...”.

Technology remains vital in today’s academic environment, but how it is used and implemented by varies between individual students with learning disabilities. The primary finding of this coded reference was that by not using non-cognitive tools students with LD can still overcome cognitive barriers faced in the community college classroom.

Disability Support Programs and Services (DSPS)

California has mandated a specific program at each California community college to provide support to students with disabilities: Disability Support Programs and Services (DSPS). These programs and supports include, but are not limited to, assessment of learning disabilities, alternative media, assistive technology, and educational assistance classes. DSPS was an identified theme that was coded 11 times and mentioned by three out of five participants as helping with their cognitive difficulties in the classroom. Although only three out of five participants directly mentioned DSP&S in their interviews, all participants used services that DSPS had to offer to students with LD.

CM was pleased with the services offered by DSPS and commented, “(w)ith the DSPS here on the [Name of the Institution] campus, they give you different strategies to learn with and whatever works best for you is what they tell you to go with.” Two other participants echoed the same sentiments as CM. SG stated:

(A) lot of the things I did learn...about myself was from DSPS. I wanted to say that because I didn't even know I had a learning disability until I came to college, saw (an LD Specialist), and she kind of went over everything that I never knew about myself...(I)t made sense because I always struggled in school.

PG used her academic accommodations prescribed by DSPS to help her with her academics in the classroom. She further reported:

I used all the programs that (were) available to me - all the accommodations. Those helped tremendously. I don't think I could've got through half of my classes if I didn't have the things I had available to me from DSPS.

According to three of the five interviewees, DSPS played a major role in the academic success and the academic attainment for students with disabilities.

Summary of Descriptive Analyses

Each research participant had a deep understanding of their cognitive challenges, implementing strategies and solutions to overcome their learning difficulties. They discussed their paths to identify and implement skills and strategies to reach metacognitive regulation and awareness. They also used cognitive tools and non-cognitive tools to support their learning. Finally, the reasonable accommodations and learning strategies provided by college DSPS departments went a long way to help each participant to address their cognitive barriers.

The research's guiding question was how LD students obtain metacognition without being explicitly taught. In the next section, the principal investigator will answer the guiding research question.

How Students Learn Metacognition

All five participants in the interview described how they learned metacognition and the researcher identified three ways that the students used to acquire metacognitive skills. They are formal learning, informal learning, and adaptation to the educational environment.

Formal learning. When an instructor or education professional plans instruction with a perceived outcome or objective to be attained by the students being taught, formal learning is taking place. SG described how different instructors and counselors would teach strategies to help her academically, further adding:

As far as learning techniques, it's been a little here a little bit there. Different instructors, different students, counselors will even sit down and...I would take a

little bit from everybody and they would kind of say, "Well try this, try this, try this." And I kind of made my own thing that works for me.

MM said she was taught learning strategies from the learning disabilities specialist who assessed her for LD. She explained, "I learned (strategies) here at the (DSPS) office when (the LD specialist) was doing all of my tests. She helped me pinpoint each cognitive defect."

Furthermore, CM states, "the (DSPS) office here has really helped with strategies, and I think it's because it really wasn't anything (I learned) in high school."

As described by the participants in the study, the formal instruction of learning strategies by various instructors and LD specialists is one of the ways that the interviewees acquired the metacognitive skills they utilized throughout their academics.

Informal learning. When information is passed tacitly between individuals to construct knowledge that is used in future assignments it is called informal learning. The research participants talked about the passing of metacognitive strategies through informal learning or tacit knowledge, particularly when interacting with their peers. Peer-to-peer interaction was highly emphasized when discussing metacognitive awareness with the interview participants. CM reported:

It's like everybody wants to make sure they got the right answers – 'hey what did you get for this? Hey, what did you get for that?' We bounce answers off of each other, even questions off each other to see who's on the right track or who's got a different perspective on the situation or subject...Just really, it's classmates. Classmates help me out with that.

SG observed other students in the classroom and eventually would learn how to connect with her classmates. She said, "I kind of watched other students do it. (I've) seen how (they) connect with peers in the classroom. I would see how people kind of grouped up and would ask each other questions." MM took a more philosophical approach to informal learning practice, finding, "You just learn from the world and how people process things. You usually just find

these things whenever you're trying to retain information from other people, and it's helping you learn strategies.”

The informal learning practice is a great pathway for students with learning disabilities to acquire metacognition and implement it throughout their classes and assignments. Also, informal learning serves to inform their practice once they graduate from the community college and transfer to a four-year university. The skills learned from informal learning may result in teaching students with learning disabilities how to network and communicate more effectively with others.

Adaptation over time. All of the study participants made reference to how they adapted to the educational environment and acquired metacognition strategies on their own. Although the interviewees talked about various strategies and technologies they used to acquire metacognition, they all noted that they acquired metacognitive strategies over time. As TH put it:

So the review strategy?...I would say that was (learned) through trial and error as well. It took me a while to figure out how I learn and process information, and what it takes for me to really retain something. That took a very long time for me. So, yes, I'd say through trial and error, as well.

PG voiced a similar sentiment regarding trial and error when acquiring learning strategies over time:

Trial and error, I guess. I've had a learning disability since I was in elementary school, so I've adapted throughout the years of what works best for me. I use all those tools to my advantage, but I've been dealing with it for a long time, so it's just the way I do things, and it has been for a long time.

CM discussed organizational strategies she acquired after getting overwhelmed with her academic load with no one to show her how to organize her academic tasks. So, over-time, she found these strategies on her own. She added further:

It's not something that somebody told me how to do. It's just over time, that's...what work(ed) best for me. It's just something that I just started doing for myself. And now I'm like, well, you know, maybe if I write it down, it'll seem like it's not so overwhelming.

Learning metacognition over time while one adapts to the learning environment is a strategy that can be practiced by students with learning disabilities. The interviewees talked about adapting to college and learning as if it were a way of life for everyone, although they each know it may be unique to their being a student who has a learning disability.

Applying Research Findings

This research examined how students with LD acquire metacognition and it is not focused on outcomes achieved once they learn metacognitive abilities. The goal of the study is to inform faculty and staff the best practices to employ a metacognitive theoretical framework to facilitate the learning experiences of this student population.

With the research results implicating formal learning, informal learning, and adaption over time as skills that improve success, how can those three components become a working model to help support students? Educational assistance classes could be designed in a way to use all three categories to facilitate the learning of all students regardless of disability status. The theoretical framework would instruct students with LD in how to employ metacognitive skills, such as planning, notetaking, time management, and use assistive technologies to prepare them for mainstream classes.

To an extent, all learning is situated and that is where informal learning designs of the class are helpful. Situated learning is defined as the social circumstances in which the relationship between learning occurs (Lave and Wenger, 1991). The informal learning process between LD students would happen in several ways, such as in a cohort model where all the students would collaborate during peer-to-peer interactions, normalizing the tacit flow of

knowledge between students. Another strategy that could be employed in these classes would be establishing learning partners (LPs) which would allow students with learning disabilities to facilitate interactions with their peers and be comfortable asking questions with little or no anxiety.

The adaption over time to learning situations has been discussed previously in this chapter and is identified as future knowledge. The formal learning structure that the educational assistant classes provides gives students tools to adapt to their individual educational needs, while informal learning processes give them the ability to be flexible and confident in asking their peers for coping strategies.

The results of this study will serve to introduce a pedagogical model that will give community college practitioners the flexibility to instruct students in a safe and welcoming learning environment. The aforementioned stigma and stereotypes traditionally associated with students with disabilities would be less pronounced in an academic environment that is explicitly designed to enhance learning.

Summary

The purpose of this research study was to understand how community college students with learning disabilities acquire metacognition based on their lived experience. The researcher discovered were three themes that answer this study's guiding research question: formal learning, informal learning, and adaptation over time to the learning environment and utilization of educational learning strategies.

All five research participants demonstrated having metacognitive skills and strategies in line with the research literature. The participants used a variety of metacognitive skills and strategies to accomplish their individual goals and academics. According to Burchard and

Swerdzewski (2009), learning strategies encompass a lot of different approaches for students to use to acquire learning effectively, and for students with LD, these approaches may include classroom accommodations, alternate media formats, and time management training. These learned behaviors often improved the student's ability to learn.

All five participants supported the findings of Burchard and Swerdzewski (2009) when they discussed using note taker support, audiobooks, and implementing time management skills in order to complete coursework. Some of these learning supports were formally instructed by an instructor or LD specialist who works with students with disabilities by teaching them learning strategies (Reis et al., 2000). This research was supported by three of the interviewees who discussed different learning strategies that an instructor or LD specialist taught in an effort to help them compensate for their cognitive challenges.

Cognitive tools and educational software is often used with students with LD. According to Fichten et al. (2014), many students with disabilities should use some sort of technology to facilitate their learning. Three out of five participants appeared to be in line with that sentiment and utilized technology on a regular basis to help facilitate their learning. Although this confirms the literature, there is a juxtaposed view of technology from two participants in the study who preferred traditional, non-electronic technology such as pen and paper to access their coursework. When it comes to technology and students with LD, students can take it or leave it, but when it comes to compensating strategies, they seem to have overlapping views on the types of learning strategies to implement in their academic and daily lives, i.e. time management, education planning, and notetaking support.

Community college educators should take the opportunity to apply the findings of this research to acquire a better understanding of the importance of teaching metacognition,

especially given that the students in this study have found metacognitive skills and awareness to be valuable in their learning experiences. For this group, it is improbable to compete on a level playing field without assistance from others and to attain academic success while achieving a higher education degree. By listening to these students' voices, the world of higher education can learn how they acquire metacognitive skills and enlighten current and future educators who are going to teach the next generation of students with learning disabilities.

Chapter Five: Conclusions

In this final chapter of the research study, the principal investigator concluded that the way in which California Community College students with learning disabilities (LD) acquired metacognition in their pursuit of higher education goals. The California Community College system enrolled over 124,000 students with disabilities in the 2016-2017 academic year (CCCCO Data Mart, 2017), of which nearly 30,000 students were identified as having LD.

According to federal and state laws, students with LD have the right to an education as equitable as their peers without disabilities. Laws, including the Rehabilitation Act of 1973 and the Americans with Disability Act of 1990, help to ensure that college students with disabilities had the opportunity to do well academically and receive specialized supports to help them succeed. These laws have changed the landscape of how students with disabilities receive their education by informing the programs designed to support them.

This study discovered that there are specific academic strategies that are helpful as reported by community college students with learning disabilities in their own words. The voices of these students regarding their lived educational experiences provides an important first step in better understanding how to serve this traditionally underserved population. The results of this study will serve to inform the practice of professionals who educate students with disabilities or assist them through campus disability support programs.

The philosophical framework used in this research study was an exploratory phenomenological approach. This approach is one that is well-suited for examining the lived experience of students. Employing this approach ensured that the identification of specific skills and strategies helped students with LD acquire and employ metacognition to improve their educational success. Using the Metacognition Awareness Inventory (MAI) to identify students

with LD who possessed a valid level of metacognitive ability and those students who met the scoring criteria were invited to be interviewed in the second phase of the study.

The purpose of the second phase was to discover the strategies that they employed in order to gain metacognitive skills throughout their educational journey, but specifically in their experiences as California Community College students. The research approach allowed a deeper exploration of the lived experience of the students as an avenue to inform the education of future college students with disabilities. This study resulted in the production of key findings, recommendations for future research, and implications of the findings of the study.

Key Findings

The guiding research question for this study was to what do students who are identified as having metacognition attribute their acquisition these skills and abilities. The research participants answered the question through their responses to the interview protocol questions during the interview portion of the study. Based on their responses, the researcher identified three relevant themes for the types of strategies that these students employed in an effort to design better educational experiences for themselves. The relevant themes will be described below and included: formal learning, informal learning, and adaptation over time.

Formal learning. Formal learning, also called structured learning, “is when the learning objectives are provided by the curriculum, the instructor, or both. (W. Martinez, personal communication, March 21, 2018).” This theme was anticipated given the formalized learning experiences that the majority of California Community College students have had, often since primary school. The Disability Support Programs and Services (DSP&S) offices provide special supports to help students with disabilities mitigate the educational limitations caused by their disabilities. Much like the formalized aspects of the classroom, these supports require the use of

formal processes and practices established by DSP&S Offices, the structures of which students must navigate in order to gain and keep access to reasonable academic accommodations.

During the interview phase of this study, all participants described having accessed their accommodations. Three out of five participants explicitly discussed the services offered by the DSP&S program. Those interviewees who regularly and consistently made use of their accommodations on their campuses, learned formally from the acquisition of supports from DSP&S. These supports included the specialized instruction courses housed in DSP&S, a course that is often taught using formal learning platforms with quantifiable goals. For these reasons, the successful strategies these students learned were examples of formal learning.

The LD specialists tasked with assessing the students in their programs used standardized tests to better understand the learning disabilities that their students had. The students who worked with the specialists in this formal environment found that what they learned about their cognitive challenges helped them become better learners. Through these formal learning experiences, students identified their learning disabilities and they were also taught strategies to address their specific learning disabilities. This work between the learning specialists and the students served to enhance metacognitive abilities of the students.

Informal learning. The second theme that was identified as helping students with disabilities to acquire metacognition was informal learning. Informal learning is identified as learning that takes place when information is passed tacitly between or among individuals. Informal learning allows learners to construct knowledge and inform future experiences. A review of the literature found a dearth of research regarding how LD students acquire knowledge through informal learning, including from their peers and instructors. The study participants emphasized peer-to-peer interactions as important when they talked about metacognitive

awareness. Each participant discussed the strategies they used to learn from their peers, including asking questions about tasks, assignments, and projects from classmates.

The interviewees found these informal learning experiences as important strategies in their becoming better students. Some participants also attributed their success in the college environment directly to their use of these strategies. Incorporating informal learning experiences in the classrooms and creating college environments that encourage informal learning experiences is an important recommendation that stems from this research study. It is clear that when students are given opportunities to learn with and from others in informal settings they can gain knowledge and skills that will serve them well during their time as students.

The researcher also found that LD students acquire metacognitive ability through trial and error or over time by adapting learned strategies that are required for their understanding. In the informal learning environment, students can facilitate their learning strategies and the study's participants found the time spent in informal learning situations to provide valuable learning opportunities. Students picked up tips and tricks for implementing new learning strategies from the time spent in informal learning situations and they learned how to adapt these strategies over time to fit their learning needs.

Adaptation over time. Adaptation over time was a third theme of the study as it was found to help students become stronger learners as they continued to adapt and acquire metacognitive skills. Adaptation over time speaks to the experiences of the participants as they adapted to their educational environment over time by implementing learned strategies in order to be successful in that environment. The study found that each of these students with learning disabilities employed various skills to help them acquire metacognition over time, relying on

their own experiences to adjust to the assignment, project, or task at hand in order to be successful.

The adaptability of the participants resulted in improved metacognitive ability, allowing them to think deeply about their cognitive challenges and use self-reflection to implement problem-solving strategies to educational barriers. Furthermore, this adaptation process could lead to self-reliance and autonomy as the students continue to refine their practice of being college students through culling and modifying learning strategies. While the process of arriving at the most appropriate learning strategies for students is continuous, the ability to make adjustments over time allows students to continue to refine their skills and evaluate them.

Technology. The literature review identified assistive technology (AT) as integral to the success of students with LD. According to Rose et al. (2006), AT is specifically designed to help students with LD compensate for the educational limitations caused by their disability. This study's findings indicated that AT, primarily in the form of cognitive tools, does help students with LD to acquire knowledge and should be used and implemented according to the individual student's needs.

It is important to consider the individual when prescribing AT for students with learning disabilities. Less than half of the participants in the research study stated their dislike for using technology to learn or had not yet explored the AT to assist them in their coursework. The majority of participants discussed using non-AT resources to support their learning, specifically the Internet, smartphones, and YouTube. These were ubiquitous technologies were ones that they identified as helping them acquire the information they needed in order to be successful in their formal courses.

At the start of this study, the researcher held a narrow definition of cognitive tools, but based on the voices of the interviewees he reflected on what the students considered to be cognitive tools. Through the research process, the researcher, who teaches students to use cognitive tools, has expanded his interpretation of what qualifies as a cognitive tool. This expanded definition now includes tools like: Youtube, blogs, and podcasts. By taking into account what students have expressed as a helpful learning tools, other faculty members in student support roles can also learn about technologies students value. This way, faculty members can better support students and meet them where they are with more appropriate and relevant recommendations for assistive technology tools that meet the need of the learner.

Limitations of research. The researcher met his goal of interviewing five to seven participants for this research study. The researcher acknowledges the limited size and scope of the research project which was the result of the limitations associated with using a small number of colleges to solicit study participants. An additional challenge of this particular study that affected finding a larger sample size was the need to find students with a verified learning disability who also demonstrated a certain level of metacognitive ability. The researcher found that the participants themselves did not customarily divulge their disability, primarily due to the concern that there might be negative repercussions to being different from their peers without disabilities. The historical stigma of being a person with a disability stymied their confidence in sharing their disability with those they encountered in the college setting.

Another limitation of this study, which was caused by the small sample size, is that the study cannot be generalized. Therefore, the information gathered in this research study cannot be applied to every California Community College student with LD. The data gathered in this study did, however, identify specific strategies that members of this student population found improved

their educational experiences. Nevertheless, the researcher would argue that a good portion of the data presented in this study can be applied and implemented to help this specific student population be more successful academically as they learn to evaluate and refine their learning process.

Recommendations for Practitioners

The review of the literature for this study revealed that learning theories may not be considered or applied to the curriculum in educational assistance classes that are designed to support students with LD. Applying the findings of this study to the creation and teaching of educational assistance classes with relevant learning theories could ameliorate the barriers that might prevent students (regardless of disability status) from acquiring metacognition. Metacognition was outlined in the literature review above as a higher-order thinking skill that can be implemented to improve the learning experience of anyone.

It is the belief of the researcher that implementing curriculum changes to better support the formal and informal learning practices of college students with LD would help the students in these environments access better educational opportunities and as a result, find more academic success in their courses and programs. Based on the findings of this study, this change would be monumental in how we educate all students at all levels of the academic ladder. For example, if all students were taught strategies including notetaking, organization, and time management and were also provided with informal peer-to-peer support, they might develop confidence in their ability to complete required college coursework earlier on in their college experiences. While some classes already focus on teaching some of these skills, a more comprehensive approach needs to be developed in order to ensure that all students have access to instruction in the

development of these metacognitive skills. This is an issue of equity and in order to make the playing field accessible for all students, it is important to provide this training and teaching.

Educators and practitioners who work with students with LD should consider a more pragmatic approach to educating students: do what works. This practical perspective could ensure that all of our students are successful in the college setting, academically and, more importantly, in their lives. After all, this study found that the interviewees applied the strategies that they gained on campus in their lives off-campus as well. Participants identified specific strategies to improve their metacognitive abilities and realized that these same strategies would go a long way in teaching students who were new to these concepts how to acquire metacognition strategies.

Recommendations for Future Research

The literature regarding metacognition and the community college student with learning disabilities is lacking and the findings of this study can help to begin to fill this gap in the literature. This study will provide information regarding how students with LD acquire metacognitive awareness and how it can be acquired without formal educational strategies designed to facilitate metacognitive abilities. The information gathered in this study came from a small subset of this population. As a result, the study cannot be generalized.

The recommendation of the researcher is to have the California Community College Chancellor's Office do a more comprehensive study of the community college DSP&S programs by replicating this study to better understand whether metacognitive awareness does help the student with LD in acquiring metacognitive ability. If the results of a larger study mirror the results of this study, then the guidelines for DSP&S and educational assistant classes should be changed to mandate that a learning theory framework be employed to inform the design and

development of educational assistance courses that address the needs of the students in the program.

The participants in this study discussed how they adapted to their learning over time, utilizing proven compensating strategies to persist in their studies. Each student also reported that they understood they needed to address their educational limitations and work through their cognitive deficits in order to be successful in the community college environment. This study's researcher would ascribe the tenacity of the study participants to their determination and their will to learn. Duckworth, Peterson, Matthews, and Kelly (2007) called this grit, and defined it as "perseverance and passion for long-term goals (p.1087)."

Grit is exactly what the participants in this study appeared to identify as they shared their lived experiences and quests to be academically successful. The participants discussed many strategies and techniques that helped them be successful over the years, aligning their experiences with a deeper definition of grit which states: "Grit entails working strenuously toward challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress (Duckworth et al., 2007, p.1089)." These successful students with LD have proven that they have grit as they consistently employed learning strategies they deemed helpful in attaining their academic goals.

The principal investigator would like to propose a follow-up research study in which the Metacognitive Awareness Inventory would be given to students and all participants who take the survey are also interviewed. These participants would subsequently take another survey designed to identify grit and its potential impact on college students who have acquired metacognition. This follow-up study would inform researchers and practitioners about the relationships, if there are any, between metacognition and the grit one must possess to be a

successful community college student with learning disabilities. As a result of this follow-up study, California Community College educators might also gain a greater understanding of the relevance of metacognition and grit in addressing the academic barriers that some students with LD approach their learning journey with.

Implications of the Study

Being such a big system, the California community college system will find it difficult to address the problems of supporting students with disabilities through metacognition as a framework for teaching. Every year the state is rolling out new laws regarding the pace of the academic success of community college students, with funding targeting the success of the mainstream, traditional student. While these mandates will not eliminate the support of Disability Service Programs and Services (DSPS), they will likely affect the access to a college education for some students. So with all these laws, how are the conflicts in the system identified and addressed to effectively meet the needs of this student population. When it comes to increasing the use of metacognition strategies in the college classroom, the system will have to work cohesively to put into practice the activities that will promote these strategies as learning tools.

Conclusion

This study has demonstrated that practitioners who support or educate students with learning disabilities need to listen to their students to help them be successful academically. This study asked students from this population to share what they believe to be the most effective strategies that contributed to their acquisition of knowledge and metacognitive ability. Each of the interviewees in this research project shared common traits and struggles while facing learning barriers in the college setting as well as prior to their college experience. Their lived

experience should serve to inform educators and practitioners that one or two prescribed supports are not the answer. A more holistic approach that takes into account the experience of each individual student is more appropriate. It is the hope of the researcher that this study enlightens, educates, and inspires current and future practitioners and college students with learning disabilities now and into the future.

Coda

I do not have a disability; I have a gift! Others may see it as a disability, but I see it as a challenge. This challenge is a gift because I have to become stronger to get around it, and smarter to figure out how to use it; others should be so lucky.
— Shane E. Bryan, Author's bio

My name is Amar Abbott, the author of this study and my educational experiences led me to the topic and offered me the opportunity to give voice to students like me. As an African-American male with a learning disability, I am a member of communities that have been historically marginalized and deemed uneducable by the U.S. education system. I am well versed in learning how to be successful in an academic environment not designed for me. I cannot separate my experience from my identity, my pragmatic worldview and most importantly, my practice as an educator.

Completing this phenomenological research allowed me to share with others my experience with formal education through the voices of others like me. The reason I chose to do this study is to help other community college students with LD to be successful in the post-secondary milieu. A brief history of my experience as a student in the K-12 system, a Community College student, and reaching graduate-level studies, relating my experiences to those of the study's participants.

K-12 experience. My educational experience started in 1976 when I attended my first day of kindergarten, unaware of the passage of laws that would provide me equitable access to

learning. The landmark U.S. Supreme Court decision *Brown versus the Board of Education* mandated the desegregation of the U.S. public education system, and the Civil Rights Act of 1964 made discrimination based on race, color religion, sex or national origin illegal. Finally, the law that most impacted my learning experiences was the Rehabilitation Act of 1973 mandated the equal rights and access to public education.

Three years after the Rehab Act was implemented, I started my first day in kindergarten. Up until this point, I was a typical child, but in the educational environment my teachers felt I lagged behind my peers and watched me closely. The moment that I will never forget and which signaled the start of my traumatic experience with public education when during a parent teacher conference, my first grade teacher told my mother coming “that she believe(d) that I was slow and possibly had a learning disability.” This conversation began a constant stream of testing my educational abilities or the lack of thereof, as I was pulled out of class throughout the school years to be tested and retested for my learning disability. I always thought of it this endless assessment via standardized tests and classroom curriculum mad me a guinea pig to experiment with until they found strategies to help me learn properly, something which never seemed to happen. Although the teachers treated me the same as the other students, knowing that I had a learning disability did not understand how to educate me. I was not successful with the weekly spelling quizzes and other aspects of traditional learning that measured academic success. Too many times new methodologies were introduced and were unsuccessful, and antiquated, traditional learning strategies did not help me be a better student.

My experiences in the secondary environment got a little better and at times, a little worse. As an academic modification, I was allowed time in a resource room to get specialized support with my assignments. However, for some of my teachers, the practice of integrating

accommodations with the traditional classroom was inconsistent, if not lacking. I describe an example of this when I was middle school, when my teacher refused to let me access this academic modification:

One time the Civilization instructor said I could not go, citing that I did not complete the last assignment and couldn't go to the resource room until it was completed. I vehemently argued with him, as well as a seventh grader could, telling him that I (already) turned in (the) assignment and should be allowed to go to get help...He said no and that was the end of the conversation. (Abbott, 2018, p. 43)

Another instance was when a classmate called me out for my lack of progress on an in-class assignment:

I returned to my desk and started working on (the)...assignment that would take me awhile to complete because of my poor spelling ability and slower than average processing speed. (It was)... a laborious and frustrating task. By the end of the class, I had only two or three items done (and that's) when a female classmate turned around, looked at my (assignment), and stated 'I am done with my (assignment) and you only have two little sections done on yours. What have you been doing all period?' Before I responded, she turned around and started telling her friends how slow I was. (Abbott, p. 43)

This went on all through my K-12 years which left me feeling exhausted and degraded. Lived experiences like mine often influence the attitude of the student with LD's towards an education system that routinely traumatizes them, sometimes to a point where a school is not seen as an option.

College experience. Once I graduated from high school, I attempted community college where I struggled through general education courses, failing most of them, and I was miserable trying to navigate a system where I could not find any help. The only redeeming feature of my first college experience was taking welding classes, which leads to my belief that a number of LD students struggle with the academic courses and can excel in more technical education discipline, disciplines that often have kinesthetic component to the learning. Within the first year

of my welding program, a welding company manager came to our class and offered those who passed his welding test a job; I passed the test. This was a great time for me I was making okay money at a job I truly enjoyed.

Unfortunately, a year later I was laid off and returned to college. This time I discovered assistive technology, like Kurzweil, a comprehensive studies skill software that shows students different techniques to comprehend and study more effectively. I learned to use Dragon NaturallySpeaking to write all my academic papers and I use it for workplace writing assignments. I finished my Associate's degree in Welding Technologies and transferred to California State University, Sacramento where I received my Bachelor's degree in Communications with the emphasis in Digital Media. Without these technologies, my degrees would have been near impossible to finish.

Through my educational experiences, I learned how to study and employ my academic accommodations and school became a lot easier. The strategies I employed helped me manage my coursework, grasp the material and complete my goals. Graduating with my Bachelor's degree gave me the confidence to complete my Master's degree in 18 months, earning a degree in Educational Technologies and Leadership and certification as an Educational Technologist. It was satisfying to know that I, a student deemed uneducable finished an advanced degree and nobody could ever take away my academic success. Riding the wave of this success, four years later, I began doctoral studies and a highly rated program and institution.

Graduate education experience. Through every level of my education, I had what I call an imposter syndrome; a feeling like I did not belong there. As I have made my ways from community college to defending dissertation research, I sometimes find myself wondering "How did I get here and how can I possibly participate at this level of learning?" When I entered my

Master's program, the imposter raised his ugly head again and gave me a lot of doubt. Soon the feeling of not belonging and being there by mistake faded away. By contrast, my experience with my doctorate program was different; everybody in the room was highly educated and intelligent, including me. I had seemingly adapted over time to grow into knowing that I am just as smart, or smarter, than most and learned to become accustomed to being successful in academics.

Given my growing confidence and success, the doctorate program has been by far the most difficult, toughest, and demanding educational experiences, I have lived through. I knew the level of study and I knew it was going to be tough, and I still had a week five meltdown when I questioned whether I was good enough or if I could endure the rigors of the program. In one of my toughest classes, I recalled how a graduate assistant shared with me the doctoral program experience:

(he told me that)...a doctoral program (was) like putting your mouth around the outlet of a fire hydrant and turning it on full blast...(and) the amount of information one is expected to grasp and understand in a timely manner is phenomenal. I had never read so much while simultaneously having to learn so many different concepts and I found myself overwhelmed with the volume of work demanded of me. The pressure finally came to a head in week five of my first quarter when I had a meltdown. Although I was saddened by the notion of quitting my first term, I knew this was unacceptable because Abbotts don't quit. (Abbott, 2018, p. 51)

Now, when faced with the imposter, I know there are two things I have to do: suck it up and fight back, and ask for help from my instructors and from my peers. This has been the first time in my academic life that I have consistently exercised this choice.

Inspired by Research Participants

The measure of a man, or woman, is not so much what they have accomplished, though that has weight. It often is much more though what that man or woman has overcome to accomplish what they have.

— Leif Gregersen, *Through the Withering Storm*

I previously stated that student with disabilities face demons, and like myself, many have believed they have to do it alone, like myself. I am pleasantly surprised by the participant's willingness to ask for help from their peers and their instructors. When I was interviewing SG she revealed:

I don't know how I learned to advocate for myself, because for a long time when I wouldn't understand something I was very shy and I was failing a lot of times. I was not getting the work done properly or ... I was suffering, my grades were suffering. So I kind of just started speaking up for myself one day and asking a million different questions in different ways to where I could get the right answer. And it worked.

It was her answer to this interview question that brought tears to my eyes. I listened to her speak on advocating for herself, something I never even considered until I was in my doctorate program. Up to that point, I was extremely stubborn and unwilling to compromise myself and ask for help. It made me excited to know after all my years of struggle and pain, student who came after me may have experienced changes for the better.

My father Ernest Abbott was an electrical engineer so my siblings and I grew up around technology and I am very comfortable with using it. It surprised me that the research findings reported that the study participants had a willingness to use different technologies to facilitate their learning. In her interview, MM discussed how technology played a role in her academic life:

I usually read blogs sometimes. I read a lot of blogs. I think technology helps a lot with that....Like for example, YouTube. I didn't understand what my professor was talking about and I had no access (to him) over the weekend so I just reviewed YouTube videos that would help me understand a bit more on the homework I was doing.

When I first attended community college, I did not have access to the various technologies available to students today that can be used to enhance learning. When I returned to the community college system I was in my early 30s, I was ecstatic about having cognitive

tools at my disposal to help me and I would have never fathom using social media, blogs, and YouTube to be a better student.

I relate to the research participants who mastered the ability to adapt their academic learning strategies over time and persevere to reach their goals. I, too, had to learn how to employ different techniques and compensating strategies in order to adapt at all levels of my academic pursuits. The level of perseverance that is demonstrated by successful students with learning disabilities a trait that contributes to their learning, especially when their whole academic life they have been labeled stupid, dumb, and ignorant.

Above all, I know the challenges a student with LD encounters when a moment of doubt comes along and the feeling of apprehension that follows. But it does not matter when this moment comes, only matters on how we handle those moments, and this may well be the difference between students that do not reach their academic potential, or a person like to myself and this study's participants, those of us who can say we are facing our academic demons and we are winning.

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APPENDIX A

Invitation To Participate

Invitation to Participate in a Research Study

Dear Participant,

My name is (insert name), I am the Dean of Student Services on behalf of Amar Abbott I like to invite you to a research study pertaining to students with a learning disability. Amar Abbott is a doctoral student in the Learning Technologies program at Pepperdine University. In fulfillment of his degree; he is conducting a research study examining how community college students with learning disabilities gain the skill needed to be successful in college. You are invited to participate in this research study project and if you agree you will participate in the first phase of the study which is a survey questionnaire. It is estimated that the survey should take no more than 20 minutes to complete. Also, once the survey is completed you will be entered in a \$50 Amazon gift card raffle for your willingness to participate in the study.

Once the survey phase is completed, you may be invited to participate in the second phase of the study, an hour-long, one-on-one interview with the researcher. The interview is estimated to take no longer than an hour. The interview will be recorded and the recording will be transcribed into text.

Participation in this study is voluntary. Your identity as a participant will remain confidential for this research project during and after the study. Every participant in the study will have a pseudonym to protect their identities. The audio recording and the transcribed texts will be protected and destroyed after five years beyond the date of the study's completion.

If you like to participate please, click on the link provided (link to survey) or if you have questions about this study and would like to participate, but need additional information. Please contact Amar Abbott, the study's principal investigator, at (XXX) XXX-XXXX or via email at amar.abbott@pepperdine.edu

Thank you.

Amar Abbott
Pepperdine University
Graduate School of Education and Psychology

APPENDIX B

Informed Consent

Informed Consent Participation in Research Activities

Principal Investigator: Amar Abbott

Faculty Advisor: Linda Polin Ph.D

Title of Study: How California Community College Students with Learning Disabilities Acquire Metacognition: A Mixed Methods Study using a Sequential Explanatory Approach

You are invited to participate in a research study conducted by Amar Abbott under the supervision of Linda Polin, Ph.D at Pepperdine University. Because you have been identified as someone who has a great deal to share about the learning challenges that face students with learning disabilities, your participation is strictly voluntary. Please read the information below, and before deciding whether to participate, feel free to ask questions about anything that you do not understand. If you choose to participate, you will be asked to sign this form in order to proceed.

PURPOSE OF THE STUDY

The purpose of the study is to understand how academically successful college students with learning disabilities engage in their college courses. It also seeks to identify the learning strategies students with disabilities use to be successful in their coursework.

STUDY PROCEDURES

This study is divided into two phases: a survey and an interview. If you volunteer to participate in the study, you will be asked to do a 20 minute survey containing 52 true or false statements about what you know about how you learn and what skills you use to be successful in your classes. Upon completion of this survey, some of you may be asked if you would be available to participate in the second part of the study, a 60 minute one-on-one interview consisting of a few questions that will help the researcher get a better understanding of how you learn.

POTENTIAL RISKS AND DISCOMFORTS

The potential and foreseeable risk associated with participation in this study is being identified as a student with learning disabilities. The researcher understands the discomfort a student may feel while talking about their disability, thus steps will be taken to reassure all participants are interviewed in a confidential and safe environment.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

While there are no direct benefits to the study participants, there are several anticipated benefits to society which include:

- ❖ Understanding how students with learning disabilities learn how to learn;
- ❖ The potential to assist in creating courses that will positively impact the learning experiences of college students with learning disabilities;
- ❖ Students with learning disabilities being more successful in completing college;
- ❖ Helping college students with disabilities to be more successful academically.

PAYMENT/COMPENSATION FOR PARTICIPATION

If you decide to participate in the survey phase of the study, you will be entered into a drawing for a \$50 Amazon gift card. In order to be eligible for the drawing, you must complete the entire survey. The drawing for the gift card will be held at the completion of the surveys. The gift card winner will be notified via email.

If you are selected for second phase interviews, you will receive a \$20 Amazon gift card for completion of the second phase interview, which will last no longer than an hour.

CONFIDENTIALITY

The records for this study will remain confidential as possible as permitted by law. However, if required to do so by law, the primary researcher, Amar Abbott, may be required to disclose information collected about you. Pepperdine's University's Human Subjects Protection Program (HSPP) may also access the data collected in this study. The HSPP occasionally reviews and monitors research studies to protect the rights and welfare of research subjects.

There will not be a record of any specific information that will identify you (names, social security numbers, addresses, or telephone numbers). This information will not be provided to anyone outside of the research team. Pseudonyms will be used to identify participants and copies of consent forms or other research study information will not be placed together in your record.

The list of participants and their emails will be kept in a locked room in a locked file cabinet for five years after completion of the study, a standard protocol for post-secondary disability support programs. The survey tools used for the interview will be Qualtrics, and it uses security methods that keep the collected data secure. The tool also has restricted access so that only those with permission protocols can review the data and related records.

The interviews conducted in the study's second phase will be audio-recorded by the researcher who will also be taking notes. All recordings will be changed into written transcripts by a company that has established processes in place to ensure the information is kept secure. The audio recordings will be downloaded onto a portable storage drive and kept in a locked cabinet in a locked room for five years after completion of the study, a standard protocol for post-secondary disability support programs.

PARTICIPATION AND WITHDRAWAL

Your participation is voluntary. Your refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights, or remedies because of your participation in this research study.

EMERGENCY CARE AND COMPENSATION FOR INJURY

If you are physically injured as a direct result of research procedures, you will receive medical treatment however, you or your medical insurance provider will be responsible for the cost. Pepperdine University does not provide any monetary compensation for injury

INVESTIGATOR'S CONTACT INFORMATION

As a participant, I understand that the principal investigator is willing to answer any inquiries I may have concerning the research herein described. I understand that I may be contacted if there are any other questions or concerns about this research. I understand that I may contact the researchers of this study if I have any other questions or concerns about this research.

Participants may contact the researchers via the emails listed below:

Principle Investigator
Amar Abbott
(XXX) XXX-XXXX
amar.abbott@pepperdine.edu

Faculty Advisor
Linda Polin
linda.polin@pepperdine.edu

RIGHTS OF RESEARCH PARTICIPANT – IRB CONTACT INFORMATION

If you have questions, concerns, or complaints about your rights as a research participant or this research study in general, please contact Dr. Judy Ho, Chairperson of the Graduate & Professional Schools Institutional Review Board at Pepperdine University, 6100 Center Drive, Suite 500, Los Angeles, CA 90045, 310-568-5753 or gpsirb@pepperdine.edu.

SIGNATURE OF RESEARCH PARTICIPANT

I have read the information provided above. I have been given a chance to ask questions. My questions have been answered to my satisfaction and I agree to participate in this study. I have been given a copy of this form.

- ☐ *I agree to be audio recorded for the study.*
- ☐ *I do not want to be audio recorded for the study.*

Name of Participant

Signature of Participant

Date

SIGNATURE OF INVESTIGATOR

I have explained the research to the participants and answered all of his/her questions. In my judgment, the participants are knowingly, willingly, and intelligently agreeing to participate in this study. They have the legal capacity to give informed consent to participate in this research study and all of the study's various components. The participants have also been informed their participation is voluntarily and that they may discontinue their participation in the study at any time and for any reason.

Name of Person Obtaining Consent

Signature of Person Obtaining Consent

Date

APPENDIX C

Metacognitive Awareness Inventory

Version Attached: Full Test

PsycTESTS Citation: Schraw, G., & Dennison, R. S. (1994). Metacognitive Awareness Inventory [Database record]. Retrieved from PsycTESTS.

doi: <http://dx.doi.org/10.1037/t21885-000>

Test Format: The measure consists of 52 items and utilizes a 100-point continuous scale. The right end of the scale indicated the statement was false about the individual and the left end indicated the statement was true.

Instrument Type: Inventory / Questionnaire

Source: Schraw, Gregory, & Dennison, Rayne Sperling. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology*, Vol 19(4), 460-475. doi:

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1. I ask myself periodically if I am meeting my goals. (M)
2. I consider several alternatives to a problem before I answer. (M)
3. I try to use strategies that have worked in the past. (PK)
4. I pace myself while learning in order to have enough time. (P)
5. I understand my intellectual strengths and weaknesses. (DK)
6. I think about what I really need to learn before I begin a task. (P)
7. I know how well I did once I finish a test. (E)
8. I set specific goals before I begin a task. (P)
9. I slow down when I encounter important information. (IMS)
10. I know what kind of information is most important to learn. (DK)
11. I ask myself if I have considered all options when solving a problem. (M)
12. I am good at organizing information. (DK)
13. I consciously focus my attention on important information. (IMS)
14. I have a specific purpose for each strategy I use. (PK)
15. I learn best when I know something about the topic. (CK)
16. I know what the teacher expects me to learn. (DK)

17. I am good at remembering information. (DK)
18. I use different learning strategies depending on the situation. (CK)
19. I ask myself if there was an easier way to do things after I finish a task. (E)
20. I have control over how well I learn. (DK)
21. I periodically review to help me understand important relationships. (M)
22. I ask myself questions about the material before I begin. (P)
23. I think of several ways to solve a problem and choose the best one. (P)
24. I summarize what I've learned after I finish. (E)
25. I ask others for help when I don't understand something. (DS)
26. I can motivate myself to learn when I need to. (CK)
27. I am aware of what strategies I use when I study. (PK)
28. I find myself analyzing the usefulness of strategies while I study. (M)
29. I use my intellectual strengths to compensate for my weaknesses. (CK)
30. I focus on the meaning and significance of new information. (IMS)
31. I create my own examples to make information more meaningful. (IMS)
32. I am a good judge of how well I understand something. (DK)
33. I find myself using helpful learning strategies automatically. (PK)
34. I find myself pausing regularly to check my comprehension. (M)
35. I know when each strategy I use will be most effective. (CK)
36. I ask myself how well I accomplished my goals once I'm finished. (E)
37. I draw pictures or diagrams to help me understand while learning. (IMS)
38. I ask myself if I have considered all options after I solve a problem. (E)
39. I try to translate new information into my own words. (IMS)
40. I change strategies when I fail to understand. (DS)
41. I use the organizational structure of the text to help me learn.
42. I read instructions carefully before I begin a task. (P)
43. I ask myself if what I'm reading is related to what I already know. (IMS)
44. I reevaluate my assumptions when I get confused. (DS)
45. I organize my time to best accomplish my goals. (P)
46. I learn more when I am interested in the topic. (DK)
47. I try to break studying down into smaller steps. (IMS)
48. I focus on overall meaning rather than specifics. (IMS)
49. I ask myself questions about how well I am doing while I am learning something new. (M)
50. I ask myself if I learned as much as I could have once I finish a task. (E)
51. I stop and go back over new information that is not clear. (DS)
52. I stop and reread when I get confused. (DS)

Note. DK = declarative knowledge; PK = procedural knowledge; CK = conditional knowledge; P = planning; IMS = information management strategies; M = monitoring; DS = debugging strategies; and E = evaluation.

APPENDIX D

Metacognitive Categories And Interview Questions

Category	Interview Questions
<p>Metacognitive Knowledge</p> <p>Knowing and understanding how to interact with your environment given variables that may or may not change the outcome of the cognitive domain (p.26).</p>	<p>1. Tell me about time when you didn't understand an assignment or task and what you did about it?</p> <p>a. How did you learn to do these things?</p>
<p>Metacognitive Experiences</p> <p>An activity that is germane to any intellectual endeavor directly affects one's knowledge regarding that activity (p.27).</p>	<p>2. Tell me about a time when you made a mistake or got confused on an assignment.</p> <p>c. Who did you ask for help?</p> <p>d. How did you learn to do these things?</p>
<p>Metacognitive Awareness</p> <p>The learner's ability to be aware of how they think (p.27).</p>	<p>3. Choose a recent task at school. What are some things you did or thought about before you began?</p> <p>d. Strategy?</p> <p>e. Plan?</p> <p>f. How did you learn to do these things?</p>
<p>Metacognitive Regulation</p> <p>Helps the learner to reflect, monitor, and plan what they have learned (p.28).</p>	<p>4. In what ways do you monitor your progress while working on an assignment?</p> <p>c. How did you learn those strategies?</p> <p>5. What are some things you do or think about before turning in your work?</p> <p>d. How did you learn those strategies?</p> <p>6. Do you think about how you can use what you have learned in the future?</p>

Metacognition Compensation Strategies

As a computer application, tools that share some of the cognition and help facilitate the construction of knowledge in any discipline that a college may offer (p. 37).

7. In what ways do you use assistive technologies?

APPENDIX E

Oral Consent Script

Hello, my name is Amar Abbott. I am a doctoral candidate and I am studying learning technologies at Pepperdine University. In fulfillment of my degree; I am conducting a research study about how community college students with learning disabilities gain the skill needed to be successful in college.

I have some interview questions that would take about 60 minutes to complete. Your participation is entirely voluntary; you may skip any questions that you don't want to answer. Also, if you get overwhelmed with any of the questions, please tell me and we will stop the interview immediately, and if you would like to talk to a wellness counselor one is available at any time.

No personally identifying information is being collected. Any personally identifiable information collected during the interview will be kept strictly confidential and in a locked filing cabinet. The data files will be archived for five years according to the DSP&S protocols the files will be deleted and destroyed.

Do you have any questions about the research study?

Are you ready to begin?

After Interview Completion: Thank you for your participation in this research study. If you have any questions later on you may reach me by email at aabbott@taftcollege.edu or by phone at (XXX) XXX-XXXX

APPENDIX F

Metacognition: Coding Book

Category	Definition	Participant Quotes
Metacognition Awareness	Metacognition awareness is the ability of a student to understand what they have learned and apply a new skill set (p. 27).	I definitely know where my cognitive defects are and I know that my weaknesses are not weaknesses unless I don't do anything about it.
Metacognitive Regulation	Metacognitive regulation helps the learner to reflect, monitor, and plan what they have learned (p. 28).	I have to read the question out loud, and I find that that helps because it's me taking my time.
Metacognitive Knowledge	Metacognitive knowledge is knowledge learners gain via the tasks they undertake and the learning strategies they use during the academic task (p. 26).	I've learned that with math, it's helpful to go to study sessions. And that helps with the long term memory because of experiencing conversations that you have with other students, and it's more interactive, and I find that you are most likely to remember a concept when there's that interaction with other students, and it's just making a memorable moment.
Metacognitive Experience	Metacognitive experience is when an activity that is connected to any academic effort directly affects one's knowledge regarding that activity (p. 27).	I have to do something about my weaknesses so that's why I've created strategies that I understand and I stick with them, and so I just find the strategies to overcome those weaknesses so that I can excel in whatever I do.
Compensation Strategies	Note-taking strategies, library skills, time management, and test taking preparation (p. 36).	I just needed to know what strategies work best for me. Like note taking has really helped in that process. Recording so that way, just hearing the way a professor explains something rather

		than reading the definition in a book is a strategy. Like it's understanding and remembering how they said it, and so recording helps a lot.
Metacognitive Cognitive Tools	A computer application that shares some of the cognition and help facilitate the construction of knowledge in any discipline that a college may offer. (p. 37)	Recording so that way, just hearing the way a professor explains something rather than reading the definition in a book is a strategy.
How Students Learn Metacognition	How participants learn metacognition as stated in interviews.	I learned here at the counseling office when [the LD Specialist] was doing all of my tests; she helped me pinpoint each cognitive defect.
Technology Other Than a Cognitive Tool	Technology such as the Internet, smartphones, and any other digital device used for learning.	I usually read blogs sometimes. I read a lot of blogs. I think technology helps a lot with that.
DSPS	If the participant references Disability Support Programs and Services (DSPS).	I did learn though about myself was from DSPS, I wanted to say that because I didn't even know I had a learning disability until I came to college.

APPENDIX G

Notice of Approval for Human Research



Pepperdine University
24255 Pacific Coast Highway
Malibu, CA 90263
TEL: 310-506-4000

Date: December 15, 2017

Protocol Investigator Name: Amar Abbott

Protocol #: 17-04-542

Project Title: How California Community College Students with Learning Disabilities Acquire

Metacognition: A Mixed Methods Study using a Sequential Explanatory Approach

School: Graduate School of Education and Psychology

Dear Abbott:

Thank you for submitting your amended expedited application to Pepperdine University's Institutional Review Board (IRB). We appreciate the work you have done on your proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. As the nature of the research met the requirements for expedited review under provision Title 45 CFR 46.110 of the federal Protection of Human Subjects Act, the IRB conducted a formal, but expedited, review of your application materials.

Based upon review, your IRB application has been approved. The IRB approval begins today December 15, 2017, and expires on July 17, 2018.

Your final consent form has been stamped by the IRB to indicate the expiration date of study approval. You can only use copies of the consent that have been stamped with the IRB expiration date to obtain consent from your participants.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit an amendment to the IRB. Please be aware that changes to your protocol may prevent the research from qualifying for expedited review and will require a submission of a new IRB application or other materials to the IRB. If contact with subjects will extend beyond July 17, 2018, a continuing review must be submitted at least one month prior to the expiration date of study approval to avoid a lapse in approval.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite the best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the IRB as soon as possible. We will ask for a complete written explanation of the event and your written response. Other actions also may be required depending on the nature of the event.

Details regarding the timeframe in which adverse events must be reported to the IRB and documenting the adverse event can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* at community.pepperdine.edu/irb.

Please refer to the protocol number denoted above in all communication or correspondence related to your application and this approval. Should you have additional questions or require clarification of the contents of this letter, please contact the IRB Office. On behalf of the IRB, I wish you success in this scholarly pursuit.

Sincerely,

Judy Ho, IRB Chairperson

cc: Dr. Lee Kats, Vice Provost for Research and Strategic Initiatives

Mr. Brett Leach, Regulatory Affairs Specialist