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Academic Self-Efficacy and Satisfaction among College Students With Autism Spectrum Disorder

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Abstract

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Dissertation Submitted in Partial Fulfillment

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Abstract

Over decades, researchers have identified an increase in autism spectrum disorder (ASD) diagnosis resulting in a growing population of students with ASD attending higher education environments. Several researchers have found that individuals with ASD experience challenges in on-campus college settings. Examining other postsecondary learning environments may have provided insight into settings that may reduce the challenges students with ASD experience. The purpose of this quantitative study was to examine differences in self-efficacy and satisfaction among college students with ASD enrolled in on-campus-only, blended, and online learning environments. The theoretical foundations were Oliver's social model of disability and Bandura's self-efficacy theory. Self-efficacy was measured by the Academic Self-Efficacy questionnaire and satisfaction was measured by the College Student Satisfaction questionnaire. Data were collected using SurveyMonkey. An analysis of variance was used to test for mean differences in self-efficacy and satisfaction between ASD students enrolled in on-campus, blended, or online learning environments. Due to a low response rate and low statistical power, no further knowledge was gained. Additional information about which learning environment best meets ASD college students' needs was not obtained from the statistical analysis. However, this study does provide insight on methodology and design for future studies on ASD college students, self-efficacy, and satisfaction, which may result in positive social change.

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MA, Walden University, 2019

MA, University of Phoenix, 2016

BS, University of Phoenix, 2014

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Dedication

With great admiration of people with ASD, I dedicate this work to the expansion of Autism awareness. This work is dedicated to those on the spectrum, their families, and to all those who, retain sensory disorders. I dedicate this entire process with love and affection to my children Salem, Daegon, and Josie, because, without you, I would have never experienced the inspiration to continue my education. Additionally, I dedicate this research in memory of my aunt Edna Faye, for all the complex conversations we had on controversial topics leading to who and where I am today.

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Chapter 1: Introduction to the Study

In 2000, one in 150 children was diagnosed with autism spectrum disorder (ASD; National Center on Birth Defects and Developmental Disabilities, 2019). By 2014, ASD diagnosis occurred for one in 59 children (National Center on Birth Defects and Developmental Disabilities, 2019). As these data indicated, there was a notable increase in the ASD diagnosis rate at the beginning of the 21st century. ASD occurs in people of all ethnicities, cultures, economic classes, and genders (National Center on Birth Defects and Developmental Disabilities, 2019). With increases in ASD diagnosis, there have been attendant increases in students with ASD entering higher education institutions (Ramsey et al., 2016). Richardson (2017) and Salimi and Kornelus (2018) described increased enrollment of students with ASD in higher education environments, including traditional on-campus settings, blended settings, and online learning environments.

Although college students with ASD are underresearched (Gelbar et al., 2014; Roux et al., 2015), some studies indicated that these students faced challenges in on-campus-only environments because of their ASD symptoms (see Hees et al., 2015). According to Hees et al. (2015), students with ASD exhibited lower grade point averages (GPAs) and higher dropout rates due to the challenges they encountered in the educational environment, as well as the symptoms of their sensory disorder. With ASD diagnosis rates increasing and more individuals with recognized ASD entering adulthood, it is important to foster the success of these individuals, given the constructive contributions that they can make to their communities. The academic success of individuals with ASD may serve the greater good of humanity while helping to produce

positive life outcomes for the ASD population. Recognizing that self-efficacy and satisfaction have been linked to academic success (British Columbia College, 2003; Broadbent, 2016), I sought to examine levels of self-efficacy and satisfaction in students with ASD who were enrolled in different higher education environments.

Researchers can contribute to positive social change by identifying pertinent information that may inform solutions to societal problems. This study's implications for positive social change resides in its potential to increase understanding of differences in self-efficacy and satisfaction among students with ASD in on-campus, blended, and online learning environments. Clear comprehension of levels of self-efficacy and satisfaction in students with ASD within different learning environments may prove helpful in identifying the most appropriate higher education environment to promote this population's academic success.

Identifying differences in these factors across learning environments may promote social change for students with ASD by providing information on which environment is well suited to meeting their academic needs through the responses of other students with ASD. Higher education facilities and administrators may use the results of this study to enhance curricula, address structural barriers for students with sensory sensitivities, and adapt the curricula to be more accommodating for students with ASD. Furthermore, this research may promote social change by helping families of students with ASD transition to an environment best suited to meeting the educational needs of their students. Examination of these factors may provide an opportunity to maximize academic success for students with ASD, thereby improving outcomes for these students as contributors to

society. Moreover, the study may contribute to social change by spreading awareness of the experiences and needs of an underresearched population (see Gelbar et al., 2014; Roux et al., 2015) and may stimulate further research.

Chapter 1 contains an introduction to the study, followed by a summary of existing studies in the topic area that served as background for this research. In presenting my problem statement, I described the research problem and its relationship to an apparent gap in the literature. The purpose of the study follows the problem statement and includes the variables of interest leading to the research questions. Next, I discussed the elements of the study's theoretical framework and how these theories related to the study. I then addressed the nature of the study, study design, variables of interest, and methodology. Additionally, I presented a list of definitions of key terms, including the dependent and independent variables, followed by assumptions underlying the study. I discussed the scope and delimitations of the study and its potential for generalization, followed by possible limitations of the study. I closed the chapter with the significance section, in which I discussed how this study may have contributed to social change by advancing knowledge of an underresearched population (Gelbar et al., 2014; Roux et al., 2015).

Background

Researchers have found that students with ASD experience challenges in academic settings. Hees et al. (2015) examined various challenges and hurdles that students with ASD faced when transitioning to postsecondary education, including difficulty adjusting to campus lifestyles and living arrangements. Additionally, Hees et al.

found that students with ASD had difficulties with social interactions and time management, noting that they often experienced sensory overload in on-campus environments. Brown and Coomes (2016), Curtin et al. (2016), Gelbar et al. (2014), and Roux et al. (2015) suggested therapeutic supports, mentoring supports, and instructional supports for students with ASD in postsecondary institutions to mitigate the challenges that these students may have experienced.

Curtin et al. (2016) found that students with ASD attending on-campus educational facilities received substantial support through face-to-face mentoring. However, Gelbar et al. (2014) found that students with ASD experienced higher anxiety, depression, and isolation compared to students without ASD in on-campus environments. Moreover, Roux et al. (2015) found that supports available for students with ASD in on-campus environments were not specifically tailored to ASD. Abidoglu et al. (2017) addressed the benefits of using technology to meet the needs of students with ASD through the perspectives of special education facilitators. Abidoglu et al. found that students with ASD were more successful with assignments that they completed with the use of technology than with activities involving desk work. Additionally, Wiorkowski's (2015) study supported the implementation of online learning as an intervention to advance students with ASD academically because distance learning limits social interactions.

Various researchers have demonstrated how student satisfaction is an important construct that has contributed to maximizing student achievement and academic outcomes. For instance, Bayraka et al. (2017) and Salimi and Kornelus (2018) evaluated

the satisfaction levels of students in online courses and on-campus courses through learning styles using paper activities and invariances. Bayraka et al. found low satisfaction levels among students in the general student population with the support available in online learning settings. However, Salimi and Kornelus found that the characteristic of suitability for online learning among a general student population coincided with higher satisfaction levels. Additionally, Oertle et al. (2017) contributed to existing research through findings suggesting that factors such as belonging, self-advocacy, and campus climate influenced academic outcomes for students with disabilities. Oertle et al. reported significantly higher levels of belonging with higher satisfaction levels among students with disabilities. Thus, I decided to examine self-efficacy among college students with ASD in all higher education learning environments.

Researchers have acknowledged that self-efficacy is an important nonacademic construct that enhances student potential and influences student academic achievement. According to Curtin et al.'s (2016) findings, face-to-face mentoring is a positive support for increasing self-efficacy among students with ASD. Additionally, Dryer et al. (2016) found that self-efficacy among students with disabilities was positively related to student GPA and academic attainment. Furthermore, Broadbent (2016) found self-efficacy to have a positive association with academic success among a general population of students. Although researchers have observed and explored the constructs of satisfaction and self-efficacy with different student populations and different learning environments, a gap remains in the literature, I aimed to address this gap by examining levels of satisfaction and self-efficacy among students with ASD in different educational settings.

Problem Statement

The autism prevalence rate has increased over 25% in the past decade (Burgstahler & Russo-Gleicher, 2015; Wright, 2017). The increased incidence of ASD diagnosis by professionals has led to an increase in the number of individuals with ASD who may attend postsecondary educational institutions (Burgstahler & Russo-Gleicher, 2015). According to Roux et al. (2015), over 35% of individuals with ASD enroll in some form of higher education. However, existing studies have revealed various challenges that people with ASD experienced in the traditional college or on-campus-only environment (Brown & Coomes, 2016; Gelbar et al., 2014). For example, students with ASD in on-campus-only higher educational environments may have difficulties related to academics, the environment, and social interaction anxiety (Petry et al., 2017; White et al., 2016).

Hees et al. (2015) examined challenges that students with ASD experienced in postsecondary on-campus-only environments. They found that environmental factors such as sensory overload represented a challenge, in addition to difficulties with time management related to coursework, adjustment to the college lifestyle, the transition to living independently, and social interactions. Burgstahler and Russo-Gleicher (2015) provided an analysis of multiple research results identifying common themes of challenges that students with ASD experienced in postsecondary on-campus-only environments. Common themes pertaining to difficulties in face-to-face environments were distractions, lighting in classrooms, crowding, group work difficulties, problems with time management, and high anxiety or frustration with social activities (Burgstahler

& Russo-Gleicher, 2015). Burgstahler and Russo-Gleicher, Richardson (2017), Wainer and Ingersoll (2013), and Wiorkowski (2015) suggested the implementation of online learning as an interventional method to advance students with ASD academically because online learning limits social interactions. The challenges that students with ASD experienced while learning on-campus may be reduced in blended or online learning environments.

Self-efficacy is a well-researched and reliable predictor of academic achievement among college students (Bartimote-Aufflick et al., 2016). Bartimote-Aufflick et al. (2016) reviewed 64 studies and found that 92% of the selected evidence-based studies reported a strong association between self-efficacy and academic achievement. Bandura (1997) defined self-efficacy as an individual's perception of their abilities in the completion of a goal or a task. Shattuck et al. (2014) inquired about students with ASD identifying as disabled and their self-efficacy levels, and then explored the distributions and correlations of an existing data set to obtain insight. Their results indicated that only 69% of students with ASD attending 2- or 4-year colleges identified themselves as having ASD or having a disability. Additionally, Shattuck et al. reported lower self-efficacy or belief in abilities among students with ASD in specific majors but a higher level of belief in ability among members of the ASD population with more effective communication skills. Therefore, there was a need to examine whether different learning environments improved or hindered self-efficacy among students with ASD. Based on research performed by Burgstahler and Russo-Gleicher, Cai and Richdale (2016), and McDowell (2015), which is discussed further in Chapter 2, students with ASD who have

poor communication skills may have higher self-efficacy in learning environments in which the need for face-to-face communication is limited.

According to BC College and Institute Student Outcomes (2003) and Schreiner (2009), satisfaction with the college experience is an important predictor of GPAs, retention, and completion outcomes. Oertle et al. (2017) found the elements of the on-campus environment, including, disability services, instruction, and social aspects as a mediator of students with disabilities sense of belonging and satisfaction. Curtin et al. (2016) determined that satisfaction among students with ASD in on-campus-only, blended, and online learning environments are possibly different because of the different social deficiencies, transition difficulties, and occurrences of sensory or social overloads students with ASD may have. Differences in satisfaction among students with ASD may differ in educational settings because of time restraints on assignments, stress responses in inclusive settings, anxiety, changes in routine, distractions, and crowding (Burgstahler & Russo-Gleicher, 2015; Hees et al., 2015; Southall, 2013). Therefore, I found a gap in the research including examining students with ASD in different learning environments and evaluating their self-efficacy and satisfaction with higher education. Examining these constructs may have helped to identify the most suitable environment for the ASD population's academic success. Researchers discussed above disclosed potential challenges students with ASD experienced in on-campus settings. With the increase in the number of students with ASD enrolling in higher education, the literature supported the necessity for locating the most beneficial postsecondary setting to increase the success rates of the ASD college population.

Purpose of the Study

The purpose of this study was to examine satisfaction and self-efficacy among postsecondary students with ASD who attended on-campus-only, blended, and online learning environments. I selected the categorical independent variable as the type of higher education setting with three conditions including, on-campus-only, blended, and online learning environments. Additionally, I selected the dependent variables of students with ASD satisfaction and self-efficacy levels in postsecondary settings.

Research Questions and Hypotheses

I have two research questions (RQ) and their accompanying hypothesis that guided this study:

RQ1: Are there differences among students with ASD attending on-campus-only, blended, or online classes in their level of satisfaction with higher education measured by the College Student Satisfaction Questionnaire?

$H_0$1: When comparing satisfaction levels as measured by the College Student Satisfaction Questionnaire, no differences exist between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings.

H_a1: When comparing satisfaction levels as measured by the College Student Satisfaction Questionnaire, there are differences between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings.

RQ2: Are there differences among students with ASD attending on-campus-only, blended, or online classes in their level of self-efficacy with higher education measured by the Academic Self-Efficacy Questionnaire?

$H_0$2: When comparing self-efficacy as measured by the Academic Self-Efficacy Questionnaire, no differences exist between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings.

H_a2: When comparing self-efficacy as measured by the Academic Self-Efficacy Questionnaire, there are differences between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings.

Theoretical Framework for the Study

Social Model of Disability

I selected Oliver's (1983) social model of disability (SMD) as this study's first theoretical foundation. Oliver dictated that an individuals' impairments do not disable the individual but that architectural or societal barriers impair the disabled. For example, people with physical, sensory, or mental impairments are subjected to hurdles at businesses, places of employment, universities, and other locations by structural challenges. Oliver suggested these types of barriers be modified or adapted to meet the needs of all disabilities.

According to Oliver (2013), the focus of his model was not only structural or architectural but also included the availability of information. Oliver's description of information includes course syllabus, information on how the class runs, program requirements, program course lineup, and how exactly the information of the curriculum is provided (by both the facilitators and administration). Information may also come in the form of course regulations by the instructors or program management through administration. Moreover, Oliver's definition of information may include allowances or

adjustments made for students with disabilities to the classroom curriculum or the program curriculum. Oliver's SMD is a framework that supports students with exceptionalities, which aligns with the quantitative methodological used in this study that involves students with ASD in postsecondary settings. I supplied a more detailed discussion on the use of Oliver's SMD in Chapter 2.

Self-Efficacy Theory

The second theoretical foundation I selected for this study is the SET, which is a portion of a broader theory of Bandura's social learning theory (SLT) and social cognitive theory (SCT). Bandura's (1997) SET entails an individual's perception of their competence, comprehension, and belief in their capabilities. According to Bandura, the four primary sources of self-efficacy are mastery experience, vicarious experiences, verbal persuasion, and physiological states. Bandura's SET is widely used in studies involving educational environments. Additionally, the SET relays that an individual with higher self-efficacy levels demonstrates lower stress levels and lower anxiety levels (Bandura, 1997). According to Bandura, self-efficacy levels regulate emotional states and make environments less intimidating. Furthermore, individuals with higher levels of self-efficacy actively calm themselves, ask for support, manage depressive symptoms, tolerate anxiety effectively, and divert attention by controlling thoughts through coping responses (Bandura, 1997).

Dryer et al. (2016) found that nonacademic factors such as managing time, stress, and concentration were influential to levels of self-efficacy among students with mental health disabilities. Additionally, according to Thompson and Verdino (2019), the

nonacademic factor of self-efficacy is also an influence on student perseverance, success, and motivation among general student populations. According to the literature, these factors such as stress, time management, and concentration coincide with challenges students with ASD experienced in on-campus-only environments, therefore, affecting self-efficacy levels. However, self-efficacy among students with ASD had not been examined for differences in on-campus-only, blended, or online learning settings. I provided a more detailed discussion of Bandura's SET in Chapter 2.

Nature of the Study

I selected the quantitative method for this study. Participants were members of the understudied ASD college population (see Roux et al., 2015). The participants were students with ASD currently attending postsecondary classes on-campus-only, blended, or online learning settings. Quantitative methodology is consistent with identifying if differences existed among students with ASD who are enrolled in on-campus-only, blended, or online learning environments in their satisfaction levels and academic self-efficacy. The locations for possible participants I selected for recruitment included social media autism support sites. Additionally, ASD support groups for families and spectrum members on social media were contacted for possible recruitment. However, low response rates required additional recruitment methods. The locations for possible participants I selected for recruitment after recruitment issues occurred included social media autism support sites, higher education institutions' disability services, participants with ASD that had previously attended college, and my university's participant pool. More details on recruitment issues are provided in Chapter 3.

The data collection instruments selected included the American College Testing's Academic Self-Efficacy Questionnaire (ASE) and the College Student Satisfaction Questionnaire (CSSQ) Form D. I used the ASE to measure academic self-efficacy. The ASE consists of 32 questions about student's perceptions of their academic ability and was delivered electronically (Educational Testing Service, 2019). The CSSQ was used to measure student satisfaction. The CSSQ was administered online. Betz, Klingensmith, and Menne (1970) developed 70 questions measuring student satisfaction with college in different areas including, working conditions, compensation, procedures, policies, quality of education, social life, and recognition (Educational Testing Service, 2019). Therefore, I selected the analytical strategy of performing 2 one-way analysis of variances (ANOVAs) to test for differences in student satisfaction and self-efficacy among students with ASD in different educational settings.

Definitions

Autism Spectrum Disorder (ASD): A chronic developmental disorder, ranging in severity that affects communication, cognition, behavior, and social interaction found among all cultures (American Psychological Association [APA], n.d.; National Institute of Mental Health [NIMH], 2018).

Blended Learning: Learning that occurs in both face-to-face on-campus school environments and through synchronous or asynchronous interactions online (Creekside Education Center, 2019).

Campus: A campus is the architectural structures and surrounding parcels of land of an academic environment, including schools, community colleges, and universities (Merriam-Webster, n.d.).

Disability Support Services: Disability support services are an educational resource provided to students with disabilities and instructors to accommodate the academic needs of individuals attending any learning environment (United States Department of Education, 2017).

Online Learning: Online learning is a form of learning that solely occurs with the internet instead of attending face-to-face on-campus-only learning environments (Merriam-Webster, n.d.).

Postsecondary Environment (PSE): Postsecondary environments are learning environments individuals attended after the completion of high school, including technical colleges, community colleges, vocational institutions, and universities for the attainment of an academic degree (IGI Global, 2019).

Self-efficacy: Self-efficacy is a person's belief in one's self in accomplishing goals, confidence in completing specific tacks, and their potential at being successful (Yancey, 2019).

Student Satisfaction: Satisfaction is commonly defined as a student's position after considering experiences, amenities, services, and environment in higher education settings (Weerasinghe et al., 2017).

Assumptions

I acknowledged several assumptions that guided this study. I assumed all participants would read and understand the informed consent. The informed consent form explained to the participant's anonymity, confidentiality, right to withdraw, and their role in the research study. Secondly, I assumed all participants would answer the surveys entirely and honestly. Thirdly, I assumed all participants would clearly understand the questions on the two surveys, and their answers would express their comprehension of what the study involved. Lastly, I assumed the answers I would obtain were an illustration of students with ASD perceptions of their postsecondary environment. The four assumptions were necessary because of the survey data I received and collected from the participants.

Scope and Delimitations

When defining the scope of this study, I aimed to determine if differences were present among students with ASD self-efficacy and satisfaction levels in different learning settings. Although there is existing research on both constructs of self-efficacy and satisfaction in different learning environments, students without ASD were the primary focus of the literature available. Ultimately, my goal was to understand which environments students with ASD had higher levels of self-efficacy and higher levels of satisfaction.

When reviewing the literature, students with ASD are described to face challenges in on-campus environments because of ASD symptoms. As stated earlier, students with ASD have demonstrated difficulties with time management, overcrowding, social

interactions, group work, transitions, architectural structure (such as lighting), sensory overloads, and communication barriers (Brown & Coomes, 2016; Gelbar et al., 2014; Hees et al., 2015). Burgstahler and Russo-Gleicher (2015) conveyed that online learning may help eliminate the challenges students with ASD faced in postsecondary settings. However, researchers have not identified the most suitable environment for maximizing students with ASD academic potential. Furthermore, as mentioned previously, Broadbent (2016) found self-efficacy to have a positive association with academic success. Moreover, according to BC College and Institute Student Outcomes (2003), satisfaction with postsecondary experiences is a predictor of student GPAs, retention, and student outcomes. Therefore, I wanted to contribute to ASD research and help fill the gap by helping identify which environments students with ASD had higher levels of self-efficacy and satisfaction.

Students with ASD attending postsecondary environments were the focus of this study because students with ASD in higher education settings are considered underresearched (see Gelbar et al., 2014; Roux et al., 2015). Any student with ASD attending a postsecondary environment over the age of 18 was allowed to participate in this study. Additional criteria for participants were added after a low response occurrence. The variability of this study should have been sufficient enough to generalize to all students with ASD attending postsecondary facilities because of the diversity in the student population and how I recruited participants.

Limitations

I was aware of several limitations that were associated with this study, including participant response bias, the use of electronic surveys, researcher bias, study attrition, and generalizability. I identified resources for possible limitations with internal validity, including the use of self-report measures and possible response bias. Additionally, I was aware that internal validity may be threatened by potential participant response bias. I was aware that response bias included responses that are not truthful or are influenced by the environment. For example, according to Creswell and Creswell (2017), a participant's response might be what the participant believes the researcher desires or society has deemed appropriate, hence affecting reliability and internal validity.

I took steps to reduce participant response bias by asking the participants to complete the surveys electronically and anonymously to prevent interaction among participants. To eliminate researcher bias, I had no direct interaction with the participants by delivering the surveys electronically and, therefore, reducing any possible researcher influence. Consequently, I also accounted for the potential for study attrition or mortality, which may have presented a limitation to internal validity in this study because of possible participant withdrawal. To reduce study attrition, I contacted multiple sources of recruitment sites to gather a large sample size. Finally, I was aware that generalizability is a threat to external validity because findings from this study may have applied to students with ASD attending postsecondary environments in the United States (see Creswell & Creswell, 2017).

Significance

In this research study, I did help fill a gap in education and autism research by centering on students with ASD satisfaction and self-efficacy levels in higher education environments. This research was important as it addressed a population that is underresearched in higher education settings (see Gelbar et al., 2014; Roux et al., 2015). Additionally, the data I obtained through this research study did not aid in the possible development of educational supports for students with ASD which may have helped to improve their academic achievement (see Brown & Coomes, 2016; Hees et al., 2015; Passey, 2015; Southhall, 2013; Wainer & Ingersoll, 2013). Furthermore, my study's outcomes will not help institutions adapt curriculum and instructional designs for meeting the needs of students with ASD to increase academic success rates (Wehman et al., 2014). However, my study can provide other researcher's insight for future research.

Summary

In Chapter 1, I included an introduction to the constructs of self-efficacy and satisfaction among students with ASD and how these constructs might have varied in this population while attending different postsecondary learning environments. Students with ASD in higher education on-campus-only environments had difficulties academically because of challenges with the environment and social interactions (Petry et al., 2017; White et al., 2016). Therefore, self-efficacy and satisfaction in blended and online learning among students with ASD may have been different because online learning and blended environments reduce challenges students with ASD experienced in on-campus-

only settings (Burgstahler & Russo-Gleicher, 2015; Richardson, 2017; Wainer & Ingersoll, 2013; Wiorkowski, 2015).

Students with ASD are at a high risk of lower academic outcomes because of challenges in association with the disorder. Moreover, researchers have linked self-efficacy and student satisfaction to productive academic outcomes or achievement (Bartimote-Aufflick et al., 2016; Broadbent, 2016; Schreiner, 2009). Therefore, researchers have identified factors possibly affecting differences in satisfaction and self-efficacy among students with ASD in educational settings. Students with ASD experienced challenges including time restraints on assignments, stress responses in inclusive settings, changes in routine, distractions, lighting in the classroom, crowding, group work difficulties, problems with time management, high anxiety, and frustration with social activities (Burgstahler & Russo-Gleicher, 2015; Hees et al., 2015; Southall, 2013).

Although there is an abundant amount of research available on the challenges this population is subjected to in postsecondary environments, I identified a gap in the research. Differences in self-efficacy and differences in satisfaction among students with ASD in on-campus-only, blended, and online learning environments are unknown. Therefore, my quantitative research study may help fill a gap by identifying differences in self-efficacy and student satisfaction among students with ASD between one independent variable with three conditions of on-campus-only, blended, and online learning environments. Using survey data completed by students with ASD attending different higher education settings, my findings from this study may help establish which

environments students with ASD have higher levels of self-efficacy and satisfaction. Moreover, the results I obtained in this study may help disability services, administrators, curriculum designers, and instructors acknowledge environmental influences affecting students with ASD. Therefore, allowing institutions to possibly develop instructional strategies or academic plans that were adapted to promote students with ASD academic potential.

In Chapter 2, I discussed an extensive literature review on ASD in different postsecondary settings. Additionally, the review included students with ASD college experiences, disability support services, and students with ASD use of technology. In Chapter 2, I also included a discussion on the two theoretical frameworks of this study, literature search strategies, and a gap in the literature.

Chapter 2: Literature Review

The increase in the frequency of diagnosis of ASD contributed to the rise in the number of students with ASD attending postsecondary environments (Burgstahler & Russo-Gleicher, 2015). Roux et al. (2015) specified that more than 35% of students with ASD enroll in higher education. However, existing research presented several challenges students with ASD experienced in traditional college settings (Brown & Coomes, 2016; Gelbar et al., 2014; Passey, 2015). Students with ASD in on-campus-only settings demonstrated difficulties academically, had challenges with social interactions, and portrayed problems with the learning environment (Petry et al., 2017; White et al., 2016).

Challenges for students with ASD experienced in higher education environments included time management, transitions to the college lifestyle, living independently, and difficulties with social interaction (Burgstahler & Russo-Gleicher, 2015). According to Burgstahler and Russo-Gleicher (2015), face-to-face environments produced additional problems, including distractions, frustration, anxiety with group work, and overcrowding, which often contributed to sensory overloads among students with ASD. They presented issues students with ASD faced in on-campus environments and suggested a universal design strategy for each challenge. Universal design is related to the development of environments and products that are made to meet the needs of all people, are usable, and accessible by everyone (Burgstahler & Russo-Gleicher, 2015). For example, they implied using universal design in an academic environment may provide an opportunity to develop accessible online or blended courses usable by everyone, including students with disabilities. Additionally, the challenges students with ASD experienced on-campus may

be reduced in blended or online learning environments because existing research suggested these environments minimized anxiety and social interactions (Burgstahler & Russo-Gleicher, 2015; Richardson, 2017; Wainer & Ingersoll, 2013; Wiorkowski, 2015).

According to Bartimote-Aufflick et al. (2016) and the BC College and Institute Student Outcomes (2003), satisfaction and self-efficacy are two factors used to assess college experiences in general student populations. However, any differences in self-efficacy and satisfaction between on-campus-only, blended, and online learning environments, among students with ASD, are not yet known. I selected two theoretical frameworks to help guide this study including, Bandura's (1977) SET and Oliver's (1983) SMD. Both Bandura's and Oliver's theories are discussed as the theoretical foundations for this literature review. Additionally, in Chapter 2, I include a summary of previous research concerning satisfaction with higher education, students with ASD, and self-efficacy in academics.

Literature Search Strategy

I used peer-reviewed sources and empirical supporting articles for this literature review: Keywords and search terms I used singularly or in combination were as follows: *postsecondary education, higher education, student self-efficacy, student satisfaction, college, brick-and-mortar, online learning, hybrid,* and *blended c*ourses. Additionally, autism search terms used in conjunction with the previous keywords were as follows: *autism, asperger's, autism and socialization, autism and behavior, autism education supports, autism and technology, supportive programs for students with ASD,* and *perceptions of students with ASD*.

Theoretical Framework

Social Model of Disability

According to Oliver (1983), an individual is not disabled by one's impairments, but by societal barriers or challenges. Researchers have used the SMD broadly in understanding how universities, workplaces, vendors, businesses, signs, stairs, and other architectural or societal barriers should be modified to support people with impairments (Oliver, 2013). According to Oliver's model, the focus is not only on structural barriers but also information. Additionally, according to Qian et al. (2018), students with intellectual disabilities are subjected to more than academic hurdles at postsecondary institutions, including organizational obstacles and methodical barriers. Therefore, Oliver's model defined impairments as sensory, functional impairments inflicted by physical disability, or mental impairments.

Qian et al. (2018) interviewed 39 students with intellectual disabilities, including students with ASD, attending a community or on-campus technical environment to obtain the student's perspectives on mentoring. Their results and the use of the SMD emphasized the need for accommodations in not only environmental accessibility barriers but also, for example, school curriculums and administrative challenges. Because of the administrative challenges such as scheduling appointments with disability services on-campus for support, the students preferred not having to schedule an appointment with mentors or coaches and the implementation of flexible scheduling. According to Qian et al., the aspects of the flexible coaching program and easy access to mentors contributed to motivation, active engagement, and successful academic outcomes in the on-campus

environment. Morina (2015) initially interviewed 44 students with disabilities at a university using SMD. The researcher then gathered microlife histories through interviews and self-reports from 16 of the same participants. Using polyphony of voices in Phase 2, Morina retrieved in-depth life histories from eight of the 16 participants. The participants identified problems with disability rights, resolution of problems by disability services, architectural challenges or accessibility, lack of support by facilitators or lecturers, and barriers with classmates. The students described an accommodating environment as one with appropriate lighting, space, and accessibility. Additionally, students suggested extensions on assignments and proactive support in compliance with curriculum standards that are not practiced or are inactive by the administration. After the collection of interviews, content and narrative analysis, Morina described how restructuring educational environments using the SMD may help students with disabilities and students with impairments by providing opportunities to participate and expand academic knowledge in inclusive higher education settings.

I selected the SMD because the SMD can help identify which learning environments accommodate the needs of students with ASD through the explorations of the student's satisfaction in on-campus-only, blended, and online learning settings. According to Oliver (2013), factors such as adaptations of architectural structure, curriculum, changing fluorescent lighting, and reducing class size in on-campus environments are those the SMD model would include as societal barriers and challenges. Therefore, adapting the environment and modifying the curriculum may prevent sensory overloads and provide an opportunity to meet the needs of students with ASD on-campus.

According to other researcher's results using the SMD, the SMD may provide a foundation for examining satisfaction among students with ASD in blended course environments because of the factors the SMD model would identify as barriers in on-campus-only environments. For example, instructors incorporating the SMD in blended courses could allow the distribution of group assignments into online portions of the course, which could lessen the social stress typically experienced among students with ASD when completing group work in the on-campus-only classroom. According to Oliver's model, blended environments might also minimize exposure to classroom crowding and architectural barriers, such as fluorescent lighting. Oliver's SMD model provides a foundation in online learning environments because online learning potentially reduces factors the SMD would consider a challenge or sensory barriers students with ASD face daily in on-campus-only or blended learning settings. Students in the online learning setting would have an opportunity to participate in discussions and group work without the social challenges students with ASD experience. Moreover, Oliver's model used in online learning addresses the issues with classroom crowding, time restraints, and fluorescent lighting that often contribute to sensory overloads.

Similar research that used the SMD included Woods' (2017) explanation of how the SMD can be used with individuals with ASD. Woods suggested that the SMD can address the barriers of social inclusion, stereotypes, employment challenges, and focus on institutional obstacles as opposed to the individual's impairments. Kruse and Oswal (2018) interviewed a student with bipolar disorder using the SMD as a foundation examining oppression or challenges students with mental disabilities faced in the on-

campus environment. They found, using a narrative and self-report method, challenges or oppositions experienced by the student with bipolar disorder were stereotyping by others and disbelief of disability. For example, the researchers mentioned that the disability is somewhat hidden, and others are skeptical because the disability is not physically seen or occurs sporadically. According to Kruse and Oswal, some of the obstacles were like barriers students with ASD encounter on-campus. Furthermore, through the implementation of 18 interviews, Gabel and Miskovic (2014) examined disability within all contexts or discourse at a university. Gabel and Miskovic identified themes among the students with disabilities that included, exclusion, time restraints on identifying as disabled to receive support, physical boundaries during instruction, and lack of professional development among facilitators, which are factors the SMD model would consider challenges.

Self-Efficacy Theory

The SET is a supplementary portion of Bandura's (1977) SCT. Bandura's SCT defined the interrelations of interpersonal, intrapersonal, behavioral, and environmental influences on human functioning (Bandura, 2012). Bandura's SCT has been used broadly in understanding classroom motivation, learning, and achievement by focusing on the learning of social skills and the impact this has on behavior.

Bandura's (1977) SCT encompasses the foundation of an individual's beliefs in capabilities through the development of self-efficacy by four contributing factors including mastery experiences, social modeling, social persuasion, and psychological or emotional states. Bandura described mastery experiences as an action to overcome

hurdles, challenges, and failures through perseverance and building resilience. Additionally, social modeling is described as watching someone similar accomplish or succeed in areas that encourage the observer to believe in one's capabilities to achieve (Bandura, 2012). Furthermore, social persuasion develops self-efficacy by influencing the individual through, for example, positive feedback received in classroom environments. Bandura explained that the contributions of social or verbal persuasion enable the individual to persevere and build resilience to challenge difficult situations. Finally, Bandura disclosed that the psychological and emotional states that aid in the development of self-efficacy also helped in the reduction of anxiety, stress, and depression. According to Bandura, the reduction of anxiety, stress, and depression aid in strengthening an individual's self-efficacy beliefs or capabilities. Because Bandura stated that self-efficacy can reduce most of the symptoms associated with ASD, I wanted to examine self-efficacy among college students with ASD in different learning environments to possibly identify the environment with the highest levels of self-efficacy.

Gebka (2014) explored psychological factors affecting academic performance among undergraduate students without disabilities using SET and the conceptual model. Gebka found self-efficacy as an influence on academic ambition along with effort, self-esteem, mastery, and performance factors in an on-campus environment. Additionally, Shattuck et al. (2014) explored self-reports of disabilities and self-efficacy quantitatively among students with ASD from the National Longitudinal Transition Study 2 (NLTS2) dataset obtained by the Department of Education from 2001 through 2009. Shattuck et al. found that communication ability significantly affected self-efficacy in areas of obtaining

information and managing obstacles among 120 participants with ASD that attended a 2- or 4-year college. Because of Shattuck et al.'s findings, I wanted to examine self-efficacy among college students with ASD in all higher education environments.

I selected the use of Bandura's SET in this study because it provided a foundation for examining self-efficacy among students with ASD in different learning environments. I used Bandura's theory to aid in identifying which learning environments accommodate the needs of students with ASD through the explorations of the student's self-efficacy in on-campus-only, blended, and online learning settings. I chose Bandura's SET because mastery experience, social modeling, and social persuasion can apply to students with ASD in blended postsecondary environments providing an opportunity for students with ASD to overcome challenges frequently occurring in on-campus-only settings. For example, students with ASD might be subjected to less social interaction in blended courses, therefore, building self-efficacy because of the lack of interpersonal demands. Social persuasion can apply in online learning environments as well but could limit social modeling interactions among students with ASD. For example, mastery experience among students with ASD in online learning environments is possibly more likely because the environment limits the barriers, such as the stress of social interaction, therefore, enhancing self-efficacy.

Literature Review Related to Key Variables

Students with ASD and College Experiences

Previous researchers of students with ASD evaluated college experiences by examining education accommodations and challenges in academic settings. Hees et al.

(2015) explored postsecondary educational experiences and hurdles individuals with ASD or developmental disorders are subjected to in college through qualitative methods. Using grounded theory as a foundation, they interviewed 23 students with ASD attending college. The challenges the students faced on-campus were difficulties with time management or constraints on coursework, adjusting to the college lifestyle or inevitable changes, living independently, and difficulties with social interactions. Hees et al. found through unstructured interviews that students with ASD experienced difficulties adjusting and maneuvering college life on-campus. They determined that students with ASD have problems with social interactions, processing information, adapting to new circumstances along with meeting academic demands, and course structures.

Cai and Richdale (2016) verified previous findings noting barriers with communication skills that contributed to anxiety and depression among students with ASD in on-campus-only environments. Through thematic analysis and focus groups, Cai and Richdale explored the needs and experiences of students with ASD on-campus. A total of 23 students and 15 family members reported transition difficulties, less structured class routines, and misinterpreting coursework instructions as experiences. Students with ASD presented in interviews additional complications due to their symptoms of ASD including, social and communication difficulties. Qualitative research provided by Anderson and Butt (2017) explored challenges experienced by students with ASD, including not receiving adequate preparation in secondary education for transitioning to postsecondary environments. Similar to Hees et al. (2015), Anderson and Butt used grounded theory but in combination with the constant comparative method to obtain

information through 18 interviews from either a parent of a student with ASD or both parent and the student. Class loads in on-campus-only environments and support services not equivalent to those received in secondary school were described by students with ASD as challenges when attending postsecondary schools. More research is needed because of the challenges students with ASD experienced on college campuses, especially relative to social interactions and the environment. Thus, online learning may help reduce some of the social difficulties students with ASD experienced with interpersonal skills.

Researchers recognized social interactions as challenges for students with ASD. Students with ASD in postsecondary, on-campus-only environments are known to have difficulties with the classroom climate and demonstrated social interaction anxiety (Petry et al., 2017; White et al., 2016). Challenges among students with ASD from the Hees et al.'s (2015) study described difficulties adjusting and maneuvering college life on-campus, problems with social interactions, processing instructional information, adapting to new circumstances or course structures, and meeting academic demands. Similarly, Anderson and Butt's (2017) study described above reaffirmed that students with ASD faced challenges with social interactions, adapting to independent living on-campus, and anxiety or depression with meeting academic demands. Additionally, using Moustakas' method of heuristic exploration, Wiorkowski (2015) explored through qualitative interviewing that students with ASD experienced a higher demand for social interaction in postsecondary on-campus-only environments because of group work activities. The 12 participants had difficulties interacting socially and working with others in, for example,

completing group assignments or projects. Gelbar et al. (2014) explored experiences and supports on-campus in 20 peer-reviewed articles, including over 65 students with ASD. Moreover, Gelbar et al. found anxiety, isolation, and depression as common themes among students with ASD on-campus, a finding that Cai and Richdale's (2016) supported. Thus, students with ASD experienced a greater requirement for socialization in higher education through, for example, group work. The students also demonstrated difficulties with academic or course structure requirements. These challenges are possibly due to symptoms associated with ASD, including information processing and poor communication skills.

Students with ASD and Disability Support Services

Previous studies of students with ASD examined the experiences of students with ASD and college support services. Curtin et al. (2016) evaluated a mentoring program and its effects on self-efficacy levels individuals with ASD through a pretest and posttest design. They examined nine participants using a quality of life scale, a self-esteem scale, and a social worry questionnaire to determine the effectiveness of a tailored mentoring program. According to Curtin et al., face-to-face mentoring was a definite support for building self-esteem, formulating goals, and improving social interactions among students with ASD. However, other researchers specified that students with ASD indicated the possibility of producing an increase in academic success rates through alternative methods by adding more program supports (Brown & Coomes, 2016; Roux et al., 2015). The primary focus of Brown and Coome's research was the examination of strategies and techniques community colleges, or postsecondary institutions used to

accommodate students with ASD. The purpose of Brown and Coomes study design was to identify the most beneficial support for the rise of ASD students attending college. Brown and Coomes contacted 400 postsecondary institutions by delivering a researcher designed survey electronically concerning interventions for students with ASD. A sum of 146 participants responded. They found that the majority of individuals with ASD attended on-campus-only community colleges, which are 2-year degree institutions in contrast to facilities offering 4-year degree programs. Brown and Coomes used a mixed-methods approach determining best practices used in community college environments. Best practices identified by the researchers included equality, individualized support, individualized accommodations, facilitator training, and transition help. However, the research conducted by Brown and Coomes did not address students with ASD in an online learning environment. According to Brown and Coome's research study mentioned above, best practices for students with ASD included fair treatment, development of individualized academic plans, campus community awareness, transition support, reductions in course loads, faculty support, and communicating effectively for comprehension. Furthermore, Brown and Coomes suggested additional strategies, including online learning for integration into postsecondary education, as a beneficial support for promoting success among students with ASD.

Accommodations or supports for students with ASD were further examined by Roux et al. (2015). They researched the fundamental influences of college life, including experiences, supports, and academics of students with ASD in postsecondary on-campus-only educational environments. The purpose of Roux et al.'s research was to expand

limited research on the life experiences of individuals with ASD furthering their education in 2-year facilities, which is similar to Brown and Coomes (2016) research mentioned above. Roux et al.'s exploratory study used survey data, phone interviews, the random selection of broad demographics to obtain recruits, and culturally diverse participants from the National Longitudinal Transition Study-2 (NLTS2), retrieved in 2009. Roux et al. concluded from the NLTS2 data available at Wave 5 with 620 participants that approximately half of the students with ASD seeking post high school educations in 2-year colleges participated in vocational courses, such as business in contrast to academic classes, such as history, English, or science. Roux et al. also found that supports at the facilities were not explicitly designed for students with ASD. Therefore, they suggested more support programs for addressing the individualized needs of students with ASD specific to the varying characteristics of ASD.

ASD and Use of Technology

Researchers also examined the influence of technology in higher education settings as a resource tool, a motivator, and as assistance for students with ASD on-campus. The following researcher's results demonstrated that technology may assist students with ASD in academic outcomes and provide support as a resource tool. Abidoglu et al. (2017) found through 11 qualitative interviews that the use of technology in class enabled successful outcomes in contrast to desk work among students with ASD. According to Abidoglu et al.'s thematic approach questioning teachers, students with ASD that participated in computer-based desk work demonstrated perseverance, consistency, stimulation, motivation, and less anxiety in classroom activities in

comparison to students with ASD using no technological assistance. Expanding upon Abidoglu et al.'s idea, Hedges et al. (2018) found through a self-designed survey instrument, that 472 students with ASD used technological devices to complete assignments, participate in group work, and submit assignments, through the use of laptops or desktops provided at school. Additionally, 87% of the participants recognized that technology enhanced their learning experience or made learning less stressful through the completion of a self-report survey implemented on-campus. McDowell (2015) reaffirmed previous research on technology as a resource tool for students with ASD by finding that technology integration for group work and using mobile technology were supports for students with exceptionalities. McDowell's study, similar to Hees et al. (2015) study mentioned previously, used constant comparative and qualitative methods but performed a case study. McDowell explored a college student with aspersers, working with a group on a project that required the use of technology for completion. McDowell found through observation and interviews that the college student with ASD participated less in the face-to-face setting with the group in contrast to the online setting. The student with ASD participated more frequently and independently with the group in the online setting through discussions and blogging. However, Hedges et al.'s study, as mentioned above, contended that students with ASD often described technology brought from homes, such as cell phones and tablets, may sometimes be a distraction from coursework. According to Burgstahler and Russo-Gleicher's (2015) article discussed earlier, the use of online coursework provided students with ASD an opportunity to follow a routine. Burgstahler and Russo-Gleicher conveyed that online learning may

provide students with weekly expectations of coursework aiding in the reduction of academic hurdles students with ASD face in on-campus-only courses. These suggestions were formulated from the results of their comparison of effective ASD teaching strategies and the use of universal design. Couzens et al. (2015) evaluated a variety of students with disabilities on-campus, including students with ASD and the disability services provided on-campus. Couzens et al. questioned seven students and eight faculty members. Through qualitative interviewing, Couzens et al. found that students with hidden disabilities, such as ASD, dyslexia, and attention deficit hyperactivity disorder (ADHD) participated less with disability note-taking services once course power-points presentations and lectures were available online. Although more students with hidden disabilities were using blended course methods, including power-point presentations and video lectures, none of the participants in the study used the assistive technology available in the on-campus library because the assistive technology was problematic. The studies discussed demonstrated that the use of technology may benefit students with ASD. Therefore, it is important to further examine online learning among students with ASD in higher education environments.

Satisfaction and Education

Satisfaction On-campus-Only

Student satisfaction levels with higher education on-campus have been examined by researchers for the general college student population. Siming et al. (2015) explored factors affecting satisfaction among general population students in on-campus-only facilities. Siming et al. used a quantitative approach to explore factors including,

academic experiences, teacher preparation, pupil and facilitator relations, services available on-campus, and campus amenities. They wanted to explore the relationships between the factors that influenced satisfaction among university participants using a questionnaire. A sum of 200 students participated in the study. According to Siming et al.'s interval scale, descriptive analysis, regression, and correlation analysis student experiences, relations with facilitators, student accommodations, faculty preparation, and on-campus facilities promoted student satisfaction in on-campus environments. Similar to Siming et al.'s research, Martirosyan (2015) explored factors that influenced satisfaction among college students and implemented the student satisfaction inventory survey (SSI) to over 350 undergraduates from 12 different universities. Martirosyan described quantitatively, that faculty preparedness, curriculum design, housing accommodations, and type of institution (public or private) also influenced student satisfaction levels in on-campus-only settings. Bassi (2019) examined student's evaluations between 2012 and 2014 in combination with data retrieved by a university delivered survey from the teacher professional development and academic educational innovation (PRODID) study. Approximately 60,000 students and 2,000 faculty members were attending. Bassi confirmed through quantitative methods, latent class analysis, and growth models that college student satisfaction on-campus depended on the quality of teaching, teaching techniques or practices, and facilitator preparedness, supporting the results of Siming et al.'s and Martirosyan's findings discussed earlier.

Factors affecting the general student population satisfaction may differ among students with ASD in on-campus settings because Qian et al. (2018) identified that

students with intellectual disabilities (ID), including students with ASD, face more than academic challenges in an on-campus environment. The researchers used qualitative methods to retrieve data directly from 39 students through interviews. They found that students with ID faced hurdles with education administration or systematic obstacles, such as communication, available accommodations, and support (Anderson & Butt, 2017; Cai & Richdale, 2016; Hees et al., 2015). However, after I analyzed the literature there is a lack of research on whether blended or online learning courses could reduce the challenges students with ASD faced in postsecondary on-campus settings.

Satisfaction in Blended or Hybrid Courses

Researchers have examined student satisfaction among general students in blended or hybrid courses, which included on-campus activity with the incorporation of some online course assignments. Zimmer (2019) described blended learning in an article as courses with face-to-face instruction and the integration of technology through various sources including, videos, emails, presentations, asynchronous, and synchronous learning. According to Chingos et al. (2017), student outcomes when comparing identical courses implemented face-to-face and in a blended format, showed no differences in learning outcomes after implementing surveys to just under 1,600 students without disabilities. However, they observed that student satisfaction with blended course format was lower than the student's satisfaction in the traditional brick-and-mortar course delivery method. Similar to Chingos et al.'s (2017) findings, Price et al. (2016) also found by administering surveys to 178 students without disabilities that students were more satisfied with traditional course delivery methods when evaluating student's

performance and satisfaction in different learning settings. However, according to White et al.'s (2016) results, mentioned above, students with ASD satisfaction levels with blended course formats may differ in contrast to the general student populations lower satisfaction levels with blended courses. According to White et al., students with ASD preferred course methods and evaluation methods that reduced personal interactions. After implementing an online survey with 67 participants and a focus group with 15 participants, they found through a mixed-methods approach that students with ASD preferred taking course content exams or writing papers over-using blogs, performing live presentations, or participating in discussions through Skype. Moreover, White et al. described qualitatively with the use of composite analysis from data of interactions in focus groups and online surveys that students with ASD preferred lectures over group work or any activities that require socialization. Therefore, based on White et al.'s results, students with ASD may have higher satisfaction with blended or hybrid course environments that reduce personal interaction through asynchronous learning.

Satisfaction in Online Learning

Current researchers have examined and described satisfaction in online education or online learning among general students. According to Bayraka et al. (2017), general college students with high satisfaction levels had success in online education programs. They analyzed student satisfaction quantitatively with the Internet-Based Distance Education Student Satisfaction Scale. A total of 155 students without disabilities enrolled in online learning at a university participated in the study. Bayraka et al. evaluated student satisfaction with the program of study, satisfaction with the course structure,

levels of satisfaction with procedures, and interactions of the survey. They found that students had low satisfaction with online support services and that satisfaction with the program of study did not differ according to individual learning styles. Guest et al. (2018) also examined satisfaction with online learning but evaluated approximately 2,600 courses using a difference-in-differences approach. Based on student surveys, they found that course satisfaction was lower in the online setting versus satisfaction in the brick-and-mortar courses provided on-campus. Guest et al. examined the student evaluations of courses from a university between 2011 and 2014. Similarly, Salimi and Kornelus (2018) evaluated student satisfaction with online learning. Salimi and Kornelus implemented a suitability for online learning questionnaire among a general population of 138 students in online learning courses. They found that student characteristics, including if the students were suitable for online education, coincided with student satisfaction. In opposition to Bayraka et al.'s study discussed above, Salimi and Kornelus found higher satisfaction in online experiences, course resources, and course organization with students that were identified as sufficient online learners. However, present and past researchers provided limited information investigating online learning among ASD, students with ASD satisfaction in higher education, and online learning satisfaction among students with ASD. Satisfaction levels may be different among students with ASD in online learning because it eliminates synchronous coursework, may lower frustration by reducing face-to-face interactions, allows flexibility with time restraints, and removes some stimulations for sensory overloads. New knowledge gained in my research may

have helped reduce these challenges students with ASD experience in on-campus-only settings by examining alternative educational environments.

Self-Efficacy and Education

Self-Efficacy

Bandura (2012) defined self-efficacy as a multifaceted construct and as a person's perception of their potential in taking a successful action to achieve short-term or long-term goals when faced with a specific task or situation. According to Yancey (2019), an individual's self-efficacy is an intrinsic motivator dictating an external behavior that helps accomplish a task or the belief in the capability to achieve the desired outcome in a situation. According to Bandura, self-efficacy influences an individual's selection of activity, motivation to participate in events, perseverance to complete a task, amount of effort in one's performance, and achievement.

Self-Efficacy On-Campus

Researchers have examined student self-efficacy levels with higher education for general college student populations. A quantitative study discussed earlier was performed by Thompson and Verdino (2019) investigating students on-campus general self-efficacy and academic self-efficacy in 2-year community colleges. Thompson and Verdino used a descriptive and inferential design to examine 180 student's general self-efficacy using the generalized perceived self-efficacy scale (GPSS), ASE, and Majer's Beliefs in Educational Success Test (BEST). Thompson and Verdino's findings contradicted previous findings of low self-efficacy among first-generation college attendants and migrants. Overall, the participants scored average to high on general self-efficacy and

average on academic self-efficacy. They suggested exploring self-efficacy in more student populations or providing mentoring through support services because limited support for first-generation college students affects academic performance. Thompson and Verdino's suggestions for increasing self-efficacy and examining additional student populations support Curtin et al.'s (2016) research study discussed above that proposed for the administration of a mentoring program to increase self-efficacy levels, social interaction and overall well-being among students with ASD in creating productive college communities.

Self-Efficacy in Blended Courses

Several researchers have explored factors affecting student success in blended and virtual courses. According to Thompson and Verdino (2019), self-efficacy is a common nonacademic factor found to affect student motivation, prosperity, and academic persistence. Zilka et al. (2019) used a mixed-method approach to identify any relationships between sensitivity to challenges, motivation, and self-efficacy among general students in blended and virtual environments. Zilka et al. implemented three different electronic surveys to over 450 university students. They determined that students with high self-efficacy felt less threatened in both blended and virtual courses. Additionally, Dryer et al. (2016) found that self-efficacy among students with disabilities is associated with higher academic performance and higher GPAs. Dryer et al. quantitatively explored factors influencing students with physical or sensory disabilities and students with mental health disabilities academic performance in on-campus and online learning courses. The researchers compared motivation, quality of life, and

academic achievement among 83 students with mental health disabilities and students with other disabilities. However, the researchers did not explore differences in self-efficacy between students in different learning environments. They determined that nonacademic factors, including time management, stress, and concentration, are influential to self-efficacy among students with disabilities. Bandura (1978) defined self-efficacy as a personal judgment of one's own ability to organize and execute any action to attain goals, which the students with hidden disabilities are demonstrating by using blended course resources. In sum, students with ASD may have higher self-efficacy in blended course environments.

Self-Efficacy in Online Learning

Self-efficacy is a nonacademic factor that affects academic performance in online learning environments for students with and without disabilities (Dryer et al., 2016; Zilka et al., 2019). Bradley et al. (2017) administered four surveys to measure online self-efficacy, motivation for learning, self-regulation, mood, and self-efficacy in self-regulation. Bradley et al. used SET among 266 students in a general population to find that students had higher levels of self-efficacy when they had previously taken more than one online course in completing an online learning course successfully. However, students with no online course experience had lower levels of self-efficacy in online learning outcomes. Bradley et al. found that self-regulation and self-efficacy unify, therefore, influencing academic success.

Vayre and Vonthron (2017) also researched self-efficacy among 255 bachelor students in online courses, through an online survey and found self-efficacy as a positive

influence on student engagement. Additionally, as mentioned earlier, Broadbent (2016) found self-efficacy to have a positive association with student success when measuring academic achievement, self-efficacy, locus of control, motivation, and online engagement among 310 university students. Furthermore, Hobson and Puruhito (2018) found self-efficacy as an overall predictor of student success, confirming Broadbent's findings.

Hobson and Puruhito (2018) used future time perspective theories and the expectancy value theory to examine constructs of motivation, including self-efficacy, and course outcomes among students in online-only courses. A sum of 409 students without disabilities were surveyed using the future time perspective scale, a self-efficacy for grade item measure, the knowledge building subscale, the perceptions of instrumentality scale, and the extrinsic instrumentality scale. They found through descriptive statistics that the use of knowledge building skills, the construct of motivation measure, self-efficacy, and the importance of task completions to obtain goals are all predictors of academic success. In sum, researchers have explored self-efficacy among students in online learning environments. However, researchers have not effectively researched self-efficacy among students with ASD in online learning environments. Therefore, research is a necessity to examine students with ASD and their levels of self-efficacy in online learning settings.

Gaps in the Literature

The research discussed in the literature review has not addressed the variables of satisfaction and self-efficacy suggested in this study among the ASD population. Additionally, none have addressed this population in on-campus-only, blended, or online

learning postsecondary environments conjointly. Existing research focused on the challenges students with ASD faced in on-campus-only situations (Brown & Coomes, 2016). Previous research has explored and examined technology use among students with ASD (Abidoglu et al., 2017). Researchers have explored satisfaction among students with disabilities in on-campus and blended environments, but not specifically, in students with ASD.

Researchers have examined self-efficacy among students with disabilities in blended environments, but not explicit to students with ASD. No research has examined the constructs of satisfaction or self-efficacy among the underresearched community of college students with ASD in all three environments (Roux et al., 2015). Some researchers have used SMD and SET for different constructs as a theoretical or conceptual framework, however many of the research studies were qualitative (Abidoglu et al., 2017; Anderson & Butt, 2017; Cai & Richdale, 2016; Gelbar et al., 2014; Hees et al., 2015). Using an interviewing approach for this study, with what is considered a vulnerable population, would have been difficult to achieve and would place limitations on the generalization of findings. A goal of my study was to survey a large sample size and generalize the results to universities and community colleges whose disability services help guide ASD students through higher education programs. Another essential goal of my study was to identify in which postsecondary environments students with ASD have higher satisfaction and higher self-efficacy levels. Hence, exploring the gap is imperative in understanding the effects of different learning environments on satisfaction

and self-efficacy levels to promote students with ASD maximum potential in higher education.

Summary

Teachers and classroom environments have direct effects on student's self-efficacy and satisfaction levels influencing academic outcomes, participation, and success. According to Ford (2019), the actual governance of classrooms and environmental ambiance has a substantial influence on students. However, teachers and classes are multifaceted in management, climate, or intrapersonal communities, and possibly affect self-efficacy and student satisfaction.

In Chapter 2, I discussed a literature search strategy, two theoretical foundations, a review of the literature, including studies related to satisfaction and self-efficacy in postsecondary environments with general student populations and students with disabilities. I examined Oliver's SMD and Bandura's SET, which formed the theoretical foundations for this study. I reviewed, synthesized, and integrated supporting publications concerning challenges students with ASD face in on-campus-only environments and college experiences. I analyzed students with ASD use of college support services and literature on the use of technology among individuals with ASD. I also explored the perceptions and results of other research scholars' work on satisfaction and self-efficacy in education to respond to the research questions of this study.

In Chapter 3, I included the research design, rationale, methodology, instrumentation, data analysis, threats to validity, and ethical procedures for a vulnerable population. The methodology consisted of the population and recruitment processes. I am

free of bias and unaware of any studies that focused on students with ASD satisfaction or self-efficacy levels in on-campus-only, blended, or online learning environments. In this study, I aimed to contribute to the fields of education and psychology by examining these variables of interest.

Chapter 3: Research Method

I planned to implement an analytical quantitative study to expand knowledge on the underresearched college ASD student population. Therefore, the purpose of this study was to examine satisfaction and self-efficacy among postsecondary students with ASD who attend on-campus-only, blended, and online learning environments. In Chapter 3, I described the research method, design, population of interest, participants that were included, the sampling procedures, data collection, instrumentation, operationalization of constructs, the ASE, the CSSQ, data analysis, possible threats to validity, and ethical procedures.

Research Method and Design

In this study, I used a survey research design and ANOVAs to compare levels of self-efficacy and satisfaction among students with ASD enrolled in different learning environments. Researchers use the parametric procedure of ANOVA to test if there are mean differences among two or more groups (Kim, 2017). I selected the use of ANOVA because the independent variable of the educational setting has three subgroups, including, on-campus-only, blended, and online learning environments. Therefore, since I selected the continuous dependent variables of self-efficacy and satisfaction and the constructs are scaled, the use of one-way ANOVA to examine both construct differences in the various educational environments was appropriate.

Population

Students with ASD attending postsecondary facilities were the target population of this study. Postsecondary institutions and teachers provide higher education

opportunities in different environments, including on-campus, blended, and online learning options. Any student with ASD enrolled in any of these higher education settings qualified for this study. Additionally, more criteria for participants were added after recruitment issues developed. According to HEATH Resource Center at the National Youth Transitions Center (2019), the exact number of students with ASD attending postsecondary environments can only be estimated because some students with ASD neglected to disclose a diagnosis. Additionally, HEATH Resource Center at the National Youth Transitions Center's website provided estimates of students with ASD currently attending higher education settings and revealed a total between 0.7% and 1.9% of the college student population are students with ASD. Like HEATH Resources Center at the National Youth Transitions Center's estimation of students with ASD enrolled or attending higher education settings, Rowe (2017) supported the statistics confirming that 2% of the college population are students with ASD. According to the United States Census Bureau (2019), the total college student population enrolled in the United States in 2018 was 18.9 million. Therefore, revealing possible totals of 1,322,999 at 0.7% to 3,780,000 at 1.9% of students with ASD enrolled in higher education.

Participants and Recruitment

The participants consisted of any student with ASD enrolled in higher education. Participants also included any past college student with ASD. Both male and female students with ASD were recruited for participation. Participants were recruited through college disability services and autism social media websites. I contacted several autism social media sites and social media support groups. First, I will refer to the social media

sites and higher education environments in this study by the pseudonym's location one, two, etc. Hence, location one, with 604,818 followers on social media, agreed and allowed a post advertising this study after meeting institutional review board (IRB) approval. Secondly, location two, an autism support group with 1,266 followers, and location three, a state autism society with 11,493 followers, also complied. Additionally, location four, a southeastern state autism society with 2,552 members, and location five, a support group for ASD students with 412 followers, promoted this study on their social media sites. The diverse members and followers of these autism support sites were individuals with ASD, their family members, or supporters of individuals with ASD that had the opportunity to either complete the surveys if qualified or share the survey link to more social media pages. Finally, location six, a southwestern state autism society with 7,486 social media followers, agreed to forward this study's survey link to their closed email group of individuals with ASD. I contacted multiple universities for recruitment sites and five university's disability services agreed. The disability service directors distributed the flyer to the students on my behalf. The university I attend gave permission to list this study in the participant pool, which included both attending students and alumni. Therefore, building a population sample of students with ASD ages 18 and up seemed achievable. The students considered eligible for this study were enrolled or previously enrolled in postsecondary education and identified as a student with ASD through self-reporting or identified by disability services on-campus.

Recruitment and Research Advertisement

First, before I started a recruitment process for research, I needed the approval of the IRB. The Walden University IRB approval number of this study was 05-27-20-0721361. Secondly, after receiving approval for research implementation from the IRB, I needed to advertise the research study in alignment with my research design. I had selected to recruit participants through social media sites. I publicly posted an ad for recruitment on the social media sites that agreed to participate. I developed an advertisement that depicts a brief outline of participant criteria, a study description of the variables, how the data would be collected, a link to SurveyMonkey, and the principal researchers' contact information (See Appendix A).

Sampling Procedures

In this study, I selected the participants using stratified sampling because each subgroup of the postsecondary environment was separated into three different strata. Students with ASD attending or who had attended on-campus-only institutions were compiled in one stratum, students with ASD enrolled or who had been enrolled in blended courses were assembled in a second stratum, and students with ASD registered in online learning or who attended distance learning were accumulated in the final stratum. Therefore, the participants in the three independent samples for this study included students with ASD who had attended or were attending on-campus-only, students with ASD enrolled in or had attended solely blended courses, and students with ASD who had attended or were attending only online learning courses.

Sample Size Analysis

I selected and conducted the *f* test, ANOVA, fixed effects, omnibus, and one-way for the power analysis to determine the sample size using the G*Power 3 program (see Faul et al., 2007). I set the alpha level at 0.05, the medium effect size to 0.25, and the statistical power to 0.80, as advised by Faul et al. (2007) and Ellis's (2010) recommendations to avoid performing an overpowered statistical test. After I conducted the power analysis for three groups, the results I obtained the robust sample size suggesting the need for a total of 159 participants. Therefore, 53 students with ASD were needed for each group. I continued recruiting attempting to gain 53 participants from on-campus-only, 53 students with ASD from blended environments, and 53 students with ASD from online learning settings.

Data Collection

In this research study, I collected data using SurveyMonkey which is encrypted with Secure Sockets Layer (SSL) and secures participant's data (see Surveymonkey, n.d.). Researchers use SurveyMonkey to ensure participants are anonymous, gather information from over millions of people, and obtain data on a variety of different topics. Students qualified for this study if they met the criteria of having ASD and were attending a postsecondary environment or had attended a postsecondary institution. I recruited participants with ASD meeting all the criteria for this study, through social media sites, disability services on-campus, a participant pool, and provided a link to SurveyMonkey to obtain data. A link to the study and the surveys were provided on autism social media sites and an accessibility flyer. The link took the participants directly

to SurveyMonkey. The informed consent form explained the research study in detail and informed the participants of their right to withdraw from the research study. Participant responses required the electronic signature of the participant on an informed consent by agreeing to complete the surveys. I included a demographic questionnaire before the ASE and CSSQ to eliminate participants that did not meet the study criteria. In the demographic questionnaire, I included if the individual had been diagnosed with ASD, what specific diagnosis the individual had received, if the participant was a student with ASD attending college, what type of college environment the individual attended, gender, age, and how many months the student had been enrolled in college (See Appendix B). As a result of the coronavirus or COVID-19 pandemic, the IRB was contacted to request the addition of three questions to account for the possibility of the disease as a factor. After permission was granted, I added three questions to the demographic questionnaire. The first inquired how many months the student attended the on-campus environment due to COVID-19. The second and third addition questioned the student's attendance in blended and online learning environments due to COVID-19. The groups of participants were divided based on the demographic question of what type of school environment the student attended. In a preliminary analysis, I examined if differences or correlations existed between the demographics and dependent variables. If differences or correlations had been found, I would have included these variables as covariates. According to Surveymonkey (n.d.), upon the participant's completion of the ASE, a link to the CSSQ was provided following the final question, opening the second survey in a new window. The students with ASD should have completed the ASE in 15 minutes and the CSSQ-

Form D within 15 minutes. Participants did not need to experience any debriefing because there was no use of deception in this study. I requested the use of the ASE (See Appendix C) and the use of the CSSQ (See Appendix D) from the copyright holders.

Instrumentation and Operationalization of Constructs

ASE

Wood and Locke (1987) developed the ASE to measure student beliefs or confidence in academic abilities including, concentration, memorization, exam concentration, understanding concepts, explaining concepts, and confidence in note taking. They explored associations between student performance, goals, and self-efficacy. The first data collection instrument I used in this study was the ASE. I used the ASE to measure academic self-efficacy among students with ASD in postsecondary environments. The Educational Testing Service (ETS) and American College Testing (ACT) provided the ASE, which consists of 32 questions about student's perceptions of their academic ability (Educational Testing Service, 2019). The ASE was modified for delivery electronically through SurveyMonkey. According to an ETS representative, each question on the ASE has two answers, one dichotomous (yes or no) and one scaled answer (confidence level). Wood and Locke measured the confidence levels using an 11-point Likert scale questioning format ranging from totally unconfident through moderately confident to totally confident. Therefore, when transferring the questionnaire to SurveyMonkey, I had to make one question into two separate inquiries, hence, making 64 questions on the electronic ASE. The participants completed the survey anonymously in 15 minutes. According to Wood and Locke, subscales selected for analysis in the final

composition of the ASE were class concentration, memorization, understanding, explaining concepts, note taking, and discriminating. The selection of these items was based on the common variance and predictive validity found by the researchers in Study 4 (Wood & Locke, 1987).

The participants answered each task completion inquiry with either yes or no and then rated their confidence level in completing the task using an 11-point Likert scale. I planned to analyze the data using the confidence levels. Additionally, process self-efficacy strength was the average of the confidence responses across the subscales for different performance levels, as seen in the study below performed by Mone (1994). Therefore, in this study, I planned to use the average confidence levels across subscales.

Wood and Locke (1987) performed a series of studies to assess college student self-efficacy using the ASE and identify any relationships with college course performance. According to Wood and Locke, the first pilot study conducted among 64 undergraduate students revealed significance in all areas of self-efficacy scores except for one. However, the researchers found that the self-efficacy magnitude scales suffered a restriction in range and produced no correlation with grades. According to Wood and Locke, the total number of yeses by participants derived the self-efficacy magnitude (SEM), and the mean confidence of all items was concluded by the self-efficacy strength (SES). Wood and Locke's purpose of the pilot study was to identify valid items from a larger selection of self-efficacy measures. They then revised the ASE based on the pilot study results and implemented three additional studies using the ASE among college students establishing six subscales on the final version (Wood & Locke, 1987). Wood

and Locke included in a second study a sum of 194 participants. In Study 3, the participants consisted of 212, and in Wave 4, participants totaled a sum of 111 undergraduate students. Throughout each study, the researchers revised the ASE according to the results by removing items with nonsignificant performance correlations and a negative influence on the internal reliability of the subscales (Wood & Locke, 1987). The researchers found that the SEM and SES had significance in Study 2, 3, and 4 with goal choice. The researchers found the scale reliabilities or Cronbach's Alpha on the self-efficacy subscales ranged between 0.73 to 0.87 with a mean reliability coefficient of 0.82 (Mone, 1994).

Mone (1994) conducted a study using the ASE examining outcome self-efficacy versus process self-efficacy, performance, and personal goals. Mone used repeated measures among 252 college students and found that the interitem reliabilities ranged between 0.69 to 0.92 with a mean of 0.83. The researcher found significance in outcome self-efficacy and goals across all implementations. Mone also found positive correlations between outcome self-efficacy and performance in all three waves. Additionally, Mone also found that personal goals were significantly correlated with performance in all trials. Therefore, Mone's exploration of differences and similarities in different types of self-efficacy (outcome and process self-efficacy) and use of the ASE supports the validation of the instrument.

CSSQ

The second data collection instrument I used is the CSSQ. The participants selected the next tab after the final question on the ASE, and a new window opened on

SurveyMonkey, allowing participants to begin the CSSQ Form D. I used the CSSQ to measure students with ASD overall satisfaction levels with college.

Betz, Menne, et al. (1970) have adapted the CSSQ since the development in 1969. Betz and others revised the CSSQ in 1971, creating Form-C (Starr, Betz, & Menne, 1971). They amended the CSSQ for a third time creating Form D, which includes 70 questions measuring student satisfaction with working conditions, social interaction or social life, compensation, quality of education, and recognition (Betz, Menne, et al., 1970). Betz, Menne, et al. (1970) used a 5-point Likert scale question format encompassing if the individual is very dissatisfied, somewhat dissatisfied, satisfied, quite satisfied, or very satisfied. I transferred each of the 70 questions of the CSSQ Form D, verbatim into SurveyMonkey so the CSSQ could be completed by participants electronically. Therefore, the survey totals 70 inquiries, and participants completed the CSSQ Form D in less than 15 minutes.

Betz, Klingensmith, and Menne (1970) validated the instrument in multiple studies on student satisfaction. Betz, Klingensmith, and Menne (1970) distributed the CSSQ to 463 college students finding internal consistency reliabilities ranging from 0.85 to 0.91, with a median of 0.88. They administered the CSSQ again in 1970 among two groups of college students implementing Form-A among a total of 643 students and a revised version of the CSSQ, Form B among a total of 492 participants in the second group. The researchers found the internal consistency reliabilities were identical to the 1969 results ranging from 0.85 to 0.91, with a median of 0.88 (Betz, Menne, et al., 1970). After revising the CSSQ again, they implemented Form C to two groups of students

totaling 1106 participants deriving the initial statistical analysis (Starr, Betz, & Menne, 1971). Later, Betz, Menne, et al. (1970) implemented the CSSQ Form C to a total of 3121 students across 10 colleges. The researchers found the internal consistency reliabilities ranged from 0.78 to 0.84 with a median of 0.82 (Starr, 1972).

Cirone (2003) assessed the reliability of the CSSQ by performing a reliability analysis of Cronbach's coefficient alpha using face, content, and construct validity. According to Cirone's study, the statistical computation results of the researchers modified 20-item inquiry CSSQ for the study's purpose, provided a reliability coefficient of 0.94. Cirone's use of face validity ensured the scale items were contingent on the purpose of the assessment. Additionally, Cirone used content validity to modify the original 70-question CSSQ, to 20 items for the researcher's study's purpose and found using convergent and discriminant validity that construct validity was present and the CSSQ is a valid assessment instrument. Furthermore, Elliot and Healy (2001) compared the CSSQ to the SSI instrument, which is widely in use today, provided by Noel-Levitz for a fee. They concluded that the CSSQ had a high convergent validity. The researchers based the CSSQ scale scores on the sum of the 14 responses for each scale, and the total satisfaction score is derived by summing all 70 items across scales (Gatlin, 2014; Starr et al., 1971).

Researchers have demonstrated that the ASE is a valid instrument designed to measure student self-efficacy. The ASE is reliable because of the interitem reliabilities consistency repeated on numerous occasions by many published researchers. These

studies, including Wood and Locke's (1987) pilot study, their following validating studies, and Mone's (1994) study previously mentioned above supported validation.

According to researchers, the ASE and CSSQ demonstrated content validity because these instruments examined the domains of the constructs of interest. Additionally, researchers supported the use of both the ASE and CSSQ because they have homogeneity and measure their intended constructs. For example, according to researchers, the ASE measured the intended construct of academic self-efficacy, and the CSSQ measured the proposed construct of college student satisfaction. Researchers use Cronbach's alpha because it is the most widely used assessment to identify the internal consistency of the instrument or instruments being used in a study (Heal & Twycross, 2015). Therefore, I selected the ASE and the CSSQ for use in this study because the instruments have proven validity and reliability and are appropriate for use with the variables I examined.

Data Analysis

I collected raw data through SurveyMonkey as participants completed the demographic inquiry and two questionnaires electronically. First, I entered the demographic questionnaire, followed by the data received from the participant responses for the ASE, and finally, I entered the responses derived from the CSSQ. I entered the data into the IBM Statistical Package for the Social Sciences (SPSS) and analyzed the data through SPSS (Version 27). The participant ASE responses provided an overall self-efficacy score by rating each of the can-do tasks, either with yes or no and then the participant's confidence levels were measured on an 11-point Likert scale. The

participant CSSQ responses provided an overall satisfaction score by calculating the sum of all inquiries on the questionnaire. I analyzed the CSSQ scale scores on the sum of the 14 responses for each scale and the total satisfaction score by summing all 70 items (Starr et al., 1971). I analyzed the 64 question ASE by the mean of the confidence responses across the six subscales. The analysis of the ASE and the 70 question CSSQ responses will be performed through SPSS by using 2 one-way ANOVAs to obtain differences in students with ASD levels of self-efficacy and levels of satisfaction between different learning environments. The following research questions were developed.

RQ1: Are there differences among students with ASD attending on-campus-only, blended, or online classes in their level of satisfaction with higher education measured by the College Student Satisfaction Questionnaire?

H_01: When comparing satisfaction levels as measured by the College Student Satisfaction Questionnaire, no differences exist between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings.

H_a1: When comparing satisfaction levels as measured by the College Student Satisfaction Questionnaire, there are differences between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings.

RQ2: Are there differences among students with ASD attending on-campus-only, blended, or online classes in their level of self-efficacy with higher education measured by the Academic Self-Efficacy Questionnaire?

$H_0$2: When comparing self-efficacy as measured by the Academic Self-Efficacy Questionnaire, no differences exist between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings.

H_a2: When comparing self-efficacy as measured by the Academic Self-Efficacy Questionnaire, there are differences between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings.

Therefore, I implemented an ANOVA to test the two null hypotheses, potentially retain the alternate hypotheses and ultimately answer the two research questions. I had adopted a minimum significance level of 0.05 before analyzing the data for statistical significance hence, each coefficient had to meet a minimum *p* value of 0.05 for significance. Concluding the analysis of the data, I have supplied a visual representation of the results for viewing. However, the sample size was not sufficient to establish statistical analysis.

Threats to Validity

I acknowledged that internal and external validity are two types of validity that could have influenced the outcomes and threatened my research results. Internal validity is threatened by my ability to derive correct inferences from the data received, the instrumentation I used to obtain my data, maturation, and attrition. To help prevent the threat of internal validity, I selected the use of the ASE and the CSSQ because these surveys align with my population of interest, (college students or the independent variable), and the dependent variables of higher education settings are being examined. I have also attempted to elude the threat of internal validity by recruiting a large participant

pool by advertising nationally through social media sites specifically related to students with ASD. Therefore, by recruiting a robust sample size, I would have lowered the opportunity for attrition to occur. Additionally, to avoid any response bias or potential researcher bias, I implemented the surveys online. Thus, the participants had no contact directly with the researcher, other participants, or other participant's survey responses. I also acknowledged the threat of external validity because it centers on generalizability to other groups. In this study, I used a specific population (students with ASD) and the findings are limited to only students with ASD. However, to minimize the potential of threats to external validity I provided implications for future research and only provided specific findings from the sample of this study.

Ethical Procedures

Walden University and federal regulations have ethical standards researchers must follow and comply with to protect human participants (Walden University, 2019). First, researchers must obtain IRB approval before collecting data. Secondly, participants must sign an informed consent. Participants signed the informed consent electronically, completed a demographics questionnaire, and then completed the two surveys on SurveyMonkey. The demographic questionnaire and the two surveys took no more than 20 minutes to complete. After the participants signed the informed consent electronically, skip logic data used in SurveyMonkey allowed or dismissed participants that did not meet the study criteria (see Surveymonkey, n.d.). Participants were advised on their rights to withdraw from the study, made aware of their anonymity in the study, and reminded that participation in the study is voluntary. Participants were notified of any potential harm on

the informed consent form including if there was a risk for physical harm, psychological, legal, social, or economic risks (Walden University, 2019). I took into consideration that the population of interest was and is considered vulnerable and contacted the IRB for any identifiable reg flags before moving forward. The students with ASD were or had attended college and must take the same courses as the general population of students. Therefore, I considered the vulnerability of the population, and the vulnerability is not considered an ethical risk. The participants were provided a phone number and email for any psychological harm experiences during the study for support. The potential for participants experiencing any risks in participating in this study poses no greater threat than completing any other SurveyMonkey survey. SurveyMonkey is secured with an SSL encryption server to protect participant's anonymity (see Surveymonkey, n.d.). Therefore, SurveyMonkey's encryption of data removed any identifying information, including email addresses, participant names, and IP addresses from the results allowing no exchanges of private information when completing the surveys. I addressed the privacy practices and notices with this study in the informed consent form and how participants responses would be used in the collection of data and that the responses would not be shared with anyone other than the researcher. I did not collect personal information, including participant names, phone numbers, email addresses, or residency information. The participant's responses were kept anonymous before data collection, during data collection, and after data collection. SurveyMonkey maintains that the data collected through SurveyMonkey would remain SSL secured for 1-year after collection and only accessible by the researcher (see Surveymonkey, n.d.). I used a password to protect the

data received through SurveyMonkey, and I stored the information in a password protected USB storage drive on a password-protected laptop that was also only accessible by the researcher. The electronic responses made by participants would be stored for a minimum of 5-years to comply with federal regulations and Walden University's ethical standard procedures (Walden University, 2019). The researcher will delete all electronic files on the secured laptop and the USB storage drive after 5-years.

Summary

In Chapter 3, I discussed the methodology of the proposed quantitative study. I also discussed the instrumentations to measure self-efficacy and satisfaction among students with ASD attending higher education environments. Additionally, in Chapter 3, I disclosed the number of participants needed to complete the proposed study and how the data would be collected through SurveyMonkey. Furthermore, in Chapter 3, I presented the ethical procedures that occurred to protect human participants anonymity and responses. I also disclosed how the participants would be selected, the skip logic that eliminated participants that did not meet the study's criteria and the validity of the two survey instruments I selected. In Chapter 3, I also discussed the informed consent form, the demographic questionnaire, the ASE instrument for measuring self-efficacy, the CSSQ instrument for measuring satisfaction, and the scoring instruction for both measures. I also disclosed how the raw data would be analyzed using SPSS. Finally, in Chapter 4, I discussed the results of the data obtained through SurveyMonkey. I also disclosed, in more detail, any statistical assumptions and visual representations of the data.

Chapter 4: Results

The purpose of this study was to examine satisfaction and self-efficacy among postsecondary students with ASD who attended on-campus-only, blended, and online learning environments. My first research question was if there are differences among students with ASD attending on-campus-only, blended, or online learning classes in their level of satisfaction with higher education measured by the CSSQ. The null hypothesis stated that when comparing satisfaction levels as measured by the CSSQ, no differences will exist between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. The alternate hypothesis was if when comparing satisfaction levels as measured by the CSSQ, there are differences between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. My second research question was if there were differences among students with ASD attending on-campus-only, blended, or online classes in their level of self-efficacy with higher education measured by the ASE. The null hypothesis for my second research question was when comparing self-efficacy as measured by the ASE, no differences will exist between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. Therefore, the alternate hypothesis for my second research question was if when comparing self-efficacy as measured by the ASE, there are differences between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings.

Chapter 3 focused on the methodology of this research study. In Chapter 3, I discussed the method for retrieving data. I used the survey method by delivering surveys

to students with ASD attending college through social media support sites and university disability services. However, Chapter 4 is centered on the results of the research I performed. Chapter 4 includes the process I followed in data collection, the results of the data collected, and a descriptive summary.

Data Collection

Data collection transpired for 1-year and 5 months on SurveyMonkey. Participant recruitment occurred through three social media platforms including, ASD support groups and ASD communities. Throughout data collection, 49 universities were contacted electronically for possible recruitment through the university's disability services. Additionally, 51 community colleges, vocational schools, and technical colleges were contacted for more participants. The research advertisement was shared on social media with five ASD communities that granted permission. The research advertisement was then shared by members of the social media platforms to various other social media pages and communities. Of the 100 schools that were contacted, only five granted me permission to share the advertisement with students through disability services and electronic communications.

Consequently, the response and completion rates were low in this study and did not meet the proposed sample size of 159 participants. Therefore, multiple changes of procedure forms were submitted to the IRB for approval. First, to rule out the onset of the COVID-19 pandemic as a possible covariate, the addition of three questions were approved to account for months the student's attendance was influenced by the virus in educational environments. Secondly, the IRB was contacted about a change in procedures

form to include universities and community colleges as recruitment sites. Thirdly, a change in procedures form was submitted to request the addition of allowing previous college students with ASD to participate in the study. After a few months with no increase in response rates, another change in procedures form was submitted to the IRB. This change in procedures forms requested the addition of an incentive of one dollar per completed response after Participant 46 as a donation to SEARCH, an autism family resource center at the University of California. As suggested by the university research reviewer, an incentive was added to the research advertisement and redistributed to all compliant recruitment sites. Consequently, only 11 participants completed both surveys after Participant 46. Therefore, the total donation amounts equaled $11. However, the response rate did not increase by much, so the IRB was contacted a final time in an attempt to obtain more participants. This change in procedures was desired because the distance learning group was seemingly small. The change in procedures form was submitted requesting the use of Walden University's participant pool to increase the number of distance learner responses. After 3 months and only a few disqualified attempts to complete the surveys, the data collection ceased after the approval of all committee members. The data was extracted from SurveyMonkey and entered into SPSS. Each survey was coded into SPSS separately. I created subscales to comply with the instructions by the authors so that testing could be performed accurately.

The responses and the total number of participants did not meet the desired amount of 53 participants per group as disclosed by the G*Power 3 program. The questionnaire demographics included a disqualification question to exclude participants

that did not have a diagnosis of ASD. SurveyMonkey allows researchers to include a skip logic method to eliminate unqualified participants. For example, I applied skip logic to the question surrounding an ASD diagnosis. If the participant answered no, SurveyMonkey sent them to a disqualification page. Thus, the participant was disqualified if they did not have an ASD diagnosis. Additionally, a participant was omitted if they only completed the demographic questions. A sum of 63 individuals attempted to complete the surveys and 29 participants were disqualified. The participants identified diagnoses including autism, autistic disorder, on the spectrum, and high functioning. Also, some participants identified as having an Asperger's diagnosis or a pervasive developmental disorder - not otherwise specified (PDD-NOS). Overall, participants answered with having an ASD diagnosis more than Asperger's, autism, autistic disorder, on the spectrum, PDD-NOS, or as high functioning. Furthermore, more female participants completed the surveys than males. However, two participants preferred not to answer the gender demographic question. The participant's ages varied from 18 to 64. No participant was over the age of 65. Most participants were attending college. A greater number of participants attended blended environments.

Demographics

I collected demographics for the ASE and CSSQ. The percentage of females that completed the ASE was 57.1%, and males totaled 43.9%. The percentage of females that completed the CSSQ was 55.9%, and males totaled 38.2%. Most participants that completed the ASE and CSSQ attended blended environments. The participants completing the ASE in blended environments totaled 57.1%. Furthermore, participants

completing the CSSQ in blended environments totaled 58.8%. The greatest number of participants completing both surveys were between the ages of 18 and 24. Hence, a total of 64.3% completed the ASE between the ages of 18 and 24, and 52.9% completed the CSSQ. The participant's number of years in school varied. Most participants completing the ASE attended less than 1-year at 32.1%. However, the majority of participants that completed the CSSQ attended 3-years at 29.4%. See Table 1.

ASE demographics

A total of 28 participants completed the ASE. These participants included 12 males and 16 females. The respondents included 11 on-campus students, 16 blended students, and one distance learner. Twenty-two participants were currently attending college, and two participants were prior attendees. Nine of the participants attended a higher education environment for under 1-year. One contributor attended for 2-years, and one participant was enrolled for 1-year. Eight of the participators attended 3-years, five attended 4-years, and four attended for 5 or more years. A total of 18 contributors were between ages 18 and 24, and five participants were between ages 25 and 34. Four additional participants were between ages 35 and 44, followed by one participant between 55 and 64. The participants included 11 with ASD, nine with Asperger's syndrome, four with an autistic disorder diagnosis, two with PDD-NOS, one participant identified as high functioning, and one identified as on the spectrum.

CSSQ Demographics

A sum of 34 participants completed the CSSQ. The total number of respondents yielded 13 males, 19 females, and two preferences not to answer. These contributors

included 10 on-campus students, 20 blended, and four distance learners. The participants currently attending college totaled 25, and nine participants previously attended college. Overall, eight of the respondents attended for less than 1-year. However, 10 participants attended for 3-years, and seven attended for 4-years. Additionally, the remaining participants included one student that attended for 1-year, one attended for 2-years, and seven participants attended for 5 or more years. Most participants were between 18 and 24. Thus, 18 were between 18 and 24, nine participants were between ages 25 to 34, six participants were between ages 35 and 44, and one participant was between the age of 55 and 64. The majority of the participants reported a diagnosis of ASD. These participants with a diagnosis of ASD totaled 20. Additional participants totaled eight with Asperger's diagnoses, two with an autistic disorder, two with PDD-NOS, with one participant that identified as high functioning, and one participant that identified as on the spectrum. See Table 1.

Table 1

ASE and CSSQ Demographics

	ASE		CSSQ	
Demographic Characteristics	*n*[a]	%	*n*[b]	%
Gender				
Male	12	42.9	13	38.2
Female	16	57.1	19	55.9
Education Environment				
On-campus	11	39.3	10	29.4
Blended	16	57.1	20	58.8
Distance	1	3.6	4	11.8
Age				
18 – 24	18	64.3	18	52.9
25 – 34	5	17.9	9	26.5
35 – 44	4	14.3	6	17.6
55 – 64	1	3.6	1	2.9
Years in School				
Less than 1	9	32.1	8	23.5
1- year	1	3.6	1	2.9
2-years	1	3.6	1	2.9
3-years	8	28.6	10	29.4
4-years	5	17.9	7	20.6
5 or more	4	14.3	7	20.6

Note. *n*[a]=28. *n*[b]=34.

Descriptives for the ASE

The sample of participants that completed the ASE totaled 28. I performed descriptive statistics for the concentration scale, memorization scale, understanding concepts scale, explaining concepts scale, and the mean across all subscales. First, the participants responses for concentration resulted in $M = 4.4881$, $SD = 3.32528$. Secondly, the participants responses for memorization yielded $M = 6.7381$, $SD = 2.55694$. For the understanding concept's $M = 5.1786$, $SD = 2.34912$. Similarly, to the understanding concepts scale, the means for the explaining concepts subscale was $M = 5.2143$, $SD = 2.30265$. For the descriptive statistics, the mean across all subscales was $M = 5.2429$, $SD = 2.23884$. See Table 2.

Table 2

ASE Descriptive Statistics

	N	Minimum	Maximum	Mean	*SD*
Environment Scale	28	1	3	1.64	.559
Concentration Scale	28	.00	10.00	4.4881	3.32528
Memorization Scale	28	1.00	10.00	6.7381	2.55694
Understanding Scale	28	.00	10.00	5.1786	2.34912
Explaining Concepts Scale	28	1.33	9.00	5.2143	2.30265
Mean Across Scales	28	1.00	9.53	5.2429	2.23884
Valid *N* (listwise)	28				

Descriptives for the CSSQ

The sample of participants that completed the CSSQ totaled 34. I performed descriptive statistics for the compensation scale, social life scale, working conditions scale, recognition scale, quality of education scale, and total satisfaction scale. First, the participants responses for compensation resulted in *M* = 3.1946, *SD* = .81237. Secondly, the participants responses for the social life scale yielded *M* = 2.9580, *SD* = .84810. For the working conditions subscale *M* = 3.2080, *SD* = .80838. Similarly, to the working conditions scale, participants responses for recognition resulted in *M* = 3.2227, *SD* = .85746. Finally, for the quality of education scale *M* = 3.2458, *SD* = .90934. Moreover, the descriptive statistics I performed for total satisfaction *M* = 15.8290, *SD* = 3.76283. See Table 3.

Table 3

CSSQ Descriptive Statistics

	N	Minimum	Maximum	Mean	*SD*
Education Environment	34	1	3	1.82	.626
Compensation	34	1.62	4.77	3.1946	.81237
Social Life	34	1.57	4.64	2.9580	.84810
Working Conditions	34	1.57	4.79	3.2080	.80838
Recognition	34	1.57	4.64	3.2227	.85746
Quality of Education	34	1.36	4.71	3.2458	.90934
Total Satisfaction	34	9.47	23.32	15.8290	3.76283
Valid *N* (listwise)	34				

Assumptions

A researcher's data must meet the assumptions of an analysis of variance to perform an ANOVA. For example, the independent variable must be categorical with three or more groups. Therefore, my data met this assumption for performing an ANOVA for both the ASE and CSSQ. Secondly, the population was randomly selected meeting another assumption for performing an ANOVA. Subsequently, unequal sample sizes increased the likelihood of a Type I error occurrence. Equal sample sizes are one of the assumptions a researcher must meet to perform a one-way ANOVA. Additionally, the dependent variables, which included self-efficacy and satisfaction, were scaled and met another assumption for performing a one-way ANOVA. Furthermore, the dependent variables met the assumption of independence and did not influence each other. However, the ASE one-way ANOVA was not robust because *N* was only equal to 28. Therefore, the assumption was not met and increased the likelihood of a Type I error rate. However, the CSSQ produced a robust one-way ANOVA because *N* was equal to 34, met the assumption, and limited the occurrence of a Type I error rate. Moreover, the homogeneity of variance assumption was met when I performed Levene's test for equality of variances on the ASE and the CSSQ.

I performed Levene's test of variances for the ASE to identify if assumptions were met for performing an ANOVA. See Table 4.

Table 4

ASE Test of Homogeneity of Variances

Levene	Statistic	*df*1	*df*2	Sig.
Mean across scales Based on Mean	.485	1	25	.493
Based on Median	.778	1	25	.386
Based on Median and with adjusted *df*	.778	1	19.522	.388
Based on trimmed mean	.526	1	25	.475

I performed Levene's test of variances for the CSSQ to identify if assumptions were met for performing an ANOVA. See Table 5.

Table 5

CSSQ Test of Homogeneity of Variances

Levene	Statistic	*df*1	*df*2	Sig.
Total Satisfaction Based on Mean	.002	2	31	.998
Based on Median	.265	2	31	.769
Based on Median and with adjusted *df*	.265	2	22.343	.769
Based on trimmed mean	.010	2	31	.990

Results

I performed the 2 one-way ANOVAs, discussed previously, to discover if any significance or differences were apparent. Subsequently, with the low population, additional tests were needed to identify any differences or significance. After discussing the matter with the committee, independent sample *t* tests were performed with bootstrapping. The distance learning group was omitted because the responses were less

than 10. Finally, median splits of ASE and CSSQ scores were created, and non-parametric analyses were attempted through chi-square analyses.

My first research question addressed if there are differences among students with ASD attending on-campus-only, blended, or online classes in their level of satisfaction with higher education measured by the CSSQ. I performed a one-way ANOVA using the data obtained from the CSSQ and found no significance. The participants concentration scale revealed $F(2, 31) = 1.005$, $p = .378$. The participants second scale of social life yielded, $F(2, 31) = .047$, $p = .954$. The participants third scale encompassing working conditions revealed, $F(2, 31) = .351$, $p = .707$. Fourthly, the participants recognition scale indicated, $F(2, 31) = 1.520$, $p = .235$. The participants result for the fifth scale, quality of education yielded, $F(2, 31) = 1.744$, $p = .191$. The participants final scale summing total satisfaction revealed, $F(2, 31) = .887$, $p = .422$. Therefore, I failed to reject the null hypothesis that no association existed when comparing satisfaction levels as measured by the CSSQ that stated there are differences between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. See Table 6.

Table 6

CSSQ One-way ANOVA

		Sum of Squares	*df*	Mean Square	*F*	Sig.
Compensation	Between Groups	1.326	2	.663	1.005	.378
	Within Groups	20.452	31	.660		
	Total	21.778	33			
Social Life	Between Groups	.072	2	.036	.047	.954
	Within Groups	23.664	31	.763		
	Total	23.736	33			
Working Conditions	Between Groups	.478	2	.239	.351	.707
	Within Groups	21.087	31	.680		
	Total	21.565	33			
Recognition	Between Groups	2.167	2	1.083	1.520	.235
	Within Groups	22.096	31	.713		
	Total	24.263	33			
Quality of Education	Between Groups	2.760	2	1.380	1.744	.191
	Within Groups	24.527	31	.791		
	Total	27.288	33			
Total Satisfaction	Between Groups	25.287	2	12.643	.887	.422
	Within Groups	441.957	31	14.257		
	Total	467.244	33			

My second research question inquired if there were differences among students with ASD attending on-campus-only, blended, or online classes in their level of self-efficacy with higher education measured by the ASE. I performed one-way ANOVAs using the data obtained with the ASE and found no significance. The one-way ANOVAs

demonstrated that the effect of all subscales, concentration, memorization, understanding concepts, explaining concepts, discriminating concepts, and the mean across scales were not significant with the on-campus-only, blended, or distance learning educational environments. The ANOVA results of the participants concentration scale yielded $F(2, 25) = .143$, $p = .867$. Secondly, the participants memorization scale ANOVA results revealed $F(2, 25) = .241$, $p = .788$. The participants ANOVA result for the third scale, understanding concepts, yielded $F(2, 25) = .660$, $p = .526$. The ANOVA results of the participants explaining concepts scale revealed $F(2, 25) = .569$, $p = .573$. The participants ANOVA result for the fifth scale, discriminating concepts scale revealed $F(2, 25) = .430$, $p = .655$. The final scale, or the mean across scales ANOVA yielded $F(2, 25) = .337$, $p = .717$. Therefore, I failed to reject the null hypothesis that when comparing self-efficacy as measured by the ASE, no differences exist between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. See Table 7.

Table 7

ASE One-way ANOVA

		Sum of Squares	*df*	Mean Square	*F*	Sig.
Concentration	Between Groups	3.387	2	1.693	.143	.867
	Within Groups	295.165	25	11.807		
	Total	298.552	27			
Memorization	Between Groups	3.339	2	1.670	.241	.788
	Within Groups	173.184	25	6.927		
	Total	176.524	27			
Understanding	Between Groups	7.471	2	3.735	.660	.526
	Within Groups	141.525	25	5.661		
	Total	148.996	27			
Explaining	Between Groups	6.237	2	3.119	.569	.573
	Within Groups	136.922	25	5.477		
	Total	143.159	27			
Discriminating	Between Groups	8.309	2	4.155	.430	.655
	Within Groups	241.326	25	9.653		
	Total	249.635	27			
Mean Across	Between Groups	3.548	2	1.774	.337	.717
	Within Groups	131.787	25	5.271		
	Total	135.335	27			

Independent Samples *t* Test

Additional analyses were needed, and I performed an independent samples *t* test using data from the ASE. The distance learning group was omitted to complete the test with the addition of bootstrapping because the number of participants was less than 10. I

found no significance. I found that Levene's test for equality of variances was not violated for the analysis and assumed homogeneity of variance was apparent. The *t* test I performed for the concentration scale resulted in *M* = 4.8788, *SD* = 1.1350 for on-campus-only and *M* = 4.1875, *SD* = .7725 for blended environments. The *t*-test results were *t*(25) = .514, *df* = 25, *p* = .612. The *t* test for the memorization scale resulted in *M* = 6.6970, *SD* = .9719 for on-campus students with ASD and (*M* = 6.8750, *SD* = .31912) for blended students yielding, *t*(25) = -.173, *df* = 25, *p* = .864. The *t* test I performed for the students understanding concepts scale resulted in *M* = 5.8182, *SD* = .6895 for on-campus-only students and *M* = 4.700, *SD* = .6135 for blended students yielding, *t*(25) = 1.146, *df* = 25, *p* = .263. The *t* test I performed for the explaining concepts scale resulted in *M* = 5.7879, *SD* = .6885 for on-campus students with ASD and *M* = 4.7500, *SD* = .5537 for students with ASD in blended environments. The *t*-tests results were *t*(25) = .996, *df* = 25, *p* = .329 for the explaining concepts scale. Next, I performed a *t* test for the discriminating concepts scale which resulted in *M* = 5.2424, *SD* = .8832 for on-campus students and *M* = 4.1250, *SD* = .7841 for the blended environment with *t*(25) = .918, *df* = 25, *p* = .367. Finally, the results of the independent samples *t* test showed that the mean self-efficacy level across scales between students with ASD in on-campus-only environments *M* = 5.6848, *SD* = .6679 and *M* = 4.9625, *SD* = .5790 for blended environments was not statistically significant at the .05 level of significance. Subsequently, with *t*(25) = .803, *df* = 25, *p* = .429, I failed to reject the null hypothesis that when comparing self-efficacy as measured by the ASE, no differences exist between

students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. See Table 8.

Table 6

ASE Independent Samples t *test with Bootstrap*

		Levene's Test for Equality of variance.		*t* test for Equality of variance				95% Confidence Interval of the difference	
		F	Sig.	*t*	*df*	Sig. (2-tailed)	Mean difference	Std. Error difference	Lower	Upper
Concentration Scale	Equal variances assumed	.604	.444	.514	25	.612	.69129	1.34582	-2.08049	3.46306
	Equal variances not assumed			.495	18.824	.626	.69129	1.39571	-2.23181	3.61438
Memorization Scale	Equal variances assumed	5.506	.027	-.173	25	.864	-.17803	1.03088	-2.30118	1.94512
	Equal variances not assumed			-.158	14.915	.877	-.17803	1.13000	-2.58777	2.23171
Understanding Concepts Scale	Equal variances assumed	.303	.587	1.146	25	.263	1.06818	.93191	-.85112	2.98748
	Equal variances variances not assumed			1.152	22.002	.262	1.06818	.92756	-.85545	2.99182
Explaining Concepts Scale	Equal variances assumed	.001	.974	.996	25	.329	.91288	.91663	-.97495	2.80070
	Equal variances not assumed			.993	21.466	.332	.91288	.91890	-.99555	2.82131
Discriminating Concepts Scale	Equal variances assumed	.291	.595	.918	25	.367	1.11742	1.21691	-1.38884	3.62369
	Equal variances not assumed			.938	23.182	.358	1.11742	1.19087	-1.34500	3.57985
Mean Across Scales	Equal variances assumed	.485	.493	.803	25	.429	.72235	.89927	-1.12974	2.57444
	Equal variances not assumed			.805	21.850	.429	.72235	.89693	-1.13851	2.58320

a.Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples.

I performed an independent samples *t* test omitting the distance learning group with the data from the CSSQ. As stated above, I included bootstrapping to identify any differences or significance. I found no significance in the results from the compensation scale where $M = 3.4231$, $SD = .2854$ for the on-campus-only students and $M = 3.1692$, $SD = .1724$ for student with ASD in blended environments yielding $t(28) = .794$, $df = 28$, $p = .434$. Secondly, I performed a *t* test for the social life scale which resulted in $M = 3.0214$, $SD = .2777$ for on-campus and $M = 2.9429$, $SD = .1945$ for blended environments with $t(28) = .229$, $df = 28$, $p = .821$. The third *t* test I performed for the CSSQ's working conditions scale resulted in $M = 3.2071$, $SD = .2950$ for on-campus students with ASD and $M = 3.2714$, $SD = .1681$ for students with ASD in blended environments with $t(28) = -.202$, $df = 28$, $p = .841$. Similarly, the results of the working conditions scale ending with no significance, the results of the *t* test I performed for the recognition scale yielded, $M = 3.3571$, $SD = .2386$ for on-campus students and $M = 3.2929$, $SD = .1867$ for students in the blended environment with $t(28) = .200$, $df = 28$, $p = .843$. The *t* test I performed for the quality of education scale resulted in $M = 3.4714$, $SD = .2535$ for on-campus students with ASD and $M = 3.2821$, $SD = .1831$ for students with ASD in blended learning environments with $t(28) = .582$, $df = 28$, $p = .565$. The results of the independent samples *t* test showed that the mean total satisfaction level between students with ASD in on-campus-only environments $M = 16.4802$, $SD = 1.1574$ and students attending blended environments $M = 15.9585$, $SD = .8340$ was not statistically significant at the .05 level with $t(28) = .360$, $df = 28$, $p = .721$. Hence, I failed to reject the null hypothesis that no

association existed when comparing satisfaction levels as measured by the CSSQ. The null stated there are differences between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. See Table 9.

Table 9

CSSQ Independent Samples t *test with Bootstrap*

		Levene's Test for Equality of variance.		*t* test for Equality of variance				95% Confidence Interval of the difference	
		F	Sig.	*t*	*df*	Sig. (2-tailed)	Mean difference	Std. Error difference	Lower	Upper
Compensation Scale	Equal variances assumed	.834	.369	.794	28	.434	.25385	.31987	-.40137	.90906
	Equal variances not assumed			.757	16.067	.460	.25385	.33511	-.45632	.96401
Social Life Scale	Equal variances assumed	.062	.805	.229	28	.821	.07857	.34343	-.62492	.78207
	Equal variances not assumed			.226	17.604	.824	.07857	.34713	-.65190	.80905
Working Conditions Scale	Equal variances assumed	.442	.512	-.202	28	.841	-.06429	.31784	-.71535	.58678
	Equal variances not assumed	Equal variances		-.186	14.747	.855	-.06429	.34505	-.80084	.67227
Recognition Scale	Equal variances assumed	.301	.588	.200	28	.843	.06429	.32159	-.59446	.72303
	Equal variances not assumed			.210	20.600	.836	.06429	.30642	-.57370	.70227
Quality of Education Scale	Equal variances assumed	.044	.835	.582	28	.565	.18929	.32537	-.47721	.85578
	Equal variances not assumed			.593	19.036	.560	.18929	.31929	-.47892	.85749
Total Satisfaction Scale	Equal variances assumed	.002	.967	.360	28	.721	.52170	1.44818	-2.44476	3.48817
	Equal variances not assumed			.364	18.546	.720	.52170	1.43508	-2.48694	3.53035

a.Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples.

Median Splits

Further analyses were needed, and I performed median splits as a final attempt to identify any differences or significance. First, I performed a median split using the ASE data by turning the continuous variables into categorical variables. I coded values below the median of 6.0000 with the number one. I coded values above the median with a numerical value of two. Additionally, scores equal to the median were randomly assigned a coded value of one or two. Next, I performed a chi-square test of association, omitting the distance learning group. Phi value equaled -.196, and Cramer's *V* value was .196. The contingency coefficient was .192, and the approximate significance was .310. Therefore, I failed to reject the null hypothesis that when comparing self-efficacy as measured by the ASE, no differences exist between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. See Table 10.

Table 10

ASE Median Split Chi-Square – Mean Across Scales and Environment

	Value	*df*	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.033[a]	1	.310		
Continuity Correction	.390	1	.532		
Likelihood Ratio	1.042	1	.307		
Fisher's Exact Test				.440	.267
Linear-by-Linear Association	.994	1	.319		
N of Valid Cases	27				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.30.
b. Computed only for a 2x2 Table.

Next, I performed a median split using the CSSQ data without the distance learning group by turning the continuous variables into categorical variables. As before, I coded values below the median of 15.9588 with the number one, and I coded values above the median with the number two. Additionally, any equal medians were randomly assigned a coded value of one or two. Next, I performed a chi-square test of association. Phi and Cramer's *V* values were 1.000 and the approximate significance was .363. Therefore, the analyses I performed indicated that there is no association between total satisfaction and the environment. Hence, I failed to reject the null hypothesis that no association existed when comparing satisfaction levels as measured by the CSSQ. The null stated there are differences between students with ASD in postsecondary on-campus-

only, blended, and online learning educational settings. I failed to reject the null hypothesis because Phi insinuated no effect. See Table 11.

Table 11

CSSQ Median Split Chi-Square - Total Satisfaction and Environment

	Value	*df*	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	30.000[a]	28	3.63		
Likelihood Ratio	38.191	28	.095		
Fisher's Exact Test				1.000	.650
Linear-by-Linear Association	.134	1	1.000		
N of Valid Cases	30				

a. 58 cells (100.0%) have expected count less than 5. The minimum expected count is 33.
b. Computed only for a 2x2 Table.

Summary

In Chapter 4, I discussed the data collection process and the results obtained in this study. I provided a visual representation of the demographics, descriptive statistics, one-way ANOVAs. My first research question addressed if there are differences among students with ASD attending on-campus-only, blended, or online classes in their level of satisfaction with higher education measured by the CSSQ. I performed a one-way ANOVA using the data obtained from the CSSQ and found no significance. Therefore, I failed to reject the null hypothesis that no association existed when comparing

satisfaction levels as measured by the CSSQ that stated there are differences between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. My second research question inquired if there were differences among students with ASD attending on-campus-only, blended, or online classes in their level of self-efficacy with higher education measured by the ASE. I discussed the assumptions for completing the 2 one-way ANOVAs and found no violations. I performed one-way ANOVAs using the data obtained with the ASE and found no significance. I failed to reject the null hypothesis that when comparing self-efficacy as measured by the ASE, no differences exist between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. More analyses were needed to examine any differences or associations. I provided representations of the additional analyses including, *t* tests with bootstrapping and chi-square median splits for the ASE and CSSQ. See tables one through 11. I described the demographical attributes of the participants that participated and provided the descriptive statistics for the ASE and CSSQ. However, the sample size was inadequate and using reliable measures still provided deficient resources to accomplish sufficient power (see Von Gunten & Bartholow, 2021). In Chapter 5, I will discuss interpretations of the findings, limitations of the study, recommendations, and implications for positive social change.

Chapter 5: Discussion and Conclusion

With increases in ASD diagnosis, there have been attendant increases in students with ASD entering higher education institutions. However, according to the literature, college students with ASD are underresearched. Most of the research has found that students with ASD experience challenges in traditional academic settings due to symptoms of their disorder. Students with ASD had difficulties with social interactions and time management, noting that they often experienced sensory overload in on-campus environments (see Hees et al., 2015). Additionally, students with ASD experienced higher anxiety, depression, and isolation compared to students without ASD in on-campus environments (Petry et al., 2017; White et al., 2016). Some researchers found that students with ASD were more successful with assignments that they completed with the use of technology than with activities involving desk work or social interactions (Burgstahler and Russo-Gleicher, (2015). Various researchers have demonstrated how student satisfaction is an important construct that contributes to maximizing student achievement and academic outcomes. Researchers have acknowledged that self-efficacy is an important nonacademic construct that enhances student potential and influences student academic achievement (see British Columbia College, 2003; Broadbent, 2016). Although researchers have observed and explored the constructs of satisfaction and self-efficacy with different student populations and different learning environments, the constructs of satisfaction and self-efficacy had not been explored among the ASD population in multiple college environments. Furthermore, with the increase in the number of students with ASD enrolling in higher education, the literature supported the

necessity for possibly locating the postsecondary setting where students with ASD had higher levels of satisfaction and self-efficacy. Therefore, the purpose of this study was to examine differences in satisfaction and self-efficacy among postsecondary students with ASD who attended on-campus-only, blended, and online learning environments.

Key Findings

Regardless of the low participant response rates, I performed several additional analyses to examine the data. As stated earlier, the initial method of analysis was 2 one-way ANOVAs. However, no significance was found. Therefore, to examine the data thoroughly I added bootstrapping and median splits. Consequently, all findings from this study were found as nonsignificant. A complete interpretation of the findings follows.

Interpretations of the Findings

This study was performed during the COVID-19 pandemic that began in January 2020. The data collection process for this study began on May 27, 2020 and ceased in October 2021. The pandemic caused restrictions on travel and shelter in place or stay-at-home orders across the country in March 2020. The stay-at-home order influenced on-campus attendance and increased virtual learning among all educational institutions. Furthermore, considering the low participant response, the nonsignificant findings of this study cannot disconfirm previous research studies. Therefore, this study does not support or confirm any literature focusing on students with ASD in on-campus only, blended, or distance learning environments. The findings do not confirm any of the literature focusing on students with ASD in college satisfaction levels in any of the three environments examined. The findings of this study do not confirm any of the literature

focusing on students with ASD in college self-efficacy levels in any of the three environments examined. Unfortunately, this study does not extend any knowledge of the literature previously discussed in Chapter 2. As mentioned in Chapter 2, some researchers have used SMD and SET for different constructs as a theoretical or conceptual framework. However, many of the research studies focusing on students with ASD were qualitative (Abidoglu et al., 2017; Anderson & Butt, 2017; Cai & Richdale, 2016; Gelbar et al., 2014; Hees et al., 2015), and this study used a quantitative approach.

Technology and ASD

As mentioned in Chapter 2, Burgstahler and Russo-Gleicher (2015) conveyed that online learning may help eliminate the challenges students with ASD face in postsecondary settings. Burgstahler and Russo-Gleicher's findings could not be supported with this study because only five participants attended distance learning environments. According to Burgstahler & Russo-Gleicher, Richardson (2017), Wainer and Ingersoll (2013), and Wiorkowski (2015), the challenges students with ASD experienced on-campus may be reduced in blended or online learning environments because existing research suggested these environments minimize anxiety and social interactions. However, these study's findings could not be supported by my research study because no significance was found between the differences in satisfaction levels or self-efficacy levels in blended or distance learning environments. McDowell (2015) reaffirmed previous research on technology as a resource tool for students with ASD by finding that technology integration for group work and using mobile technology were supports for students with exceptionalities. As mentioned above, McDowell's reaffirmation could not

be supported by this study because only five participants attended distance learning environments, and there were not enough blended environment participants to allocate any significance after performing the analysis.

Satisfaction and ASD

Researchers have explored satisfaction among students with disabilities in on-campus and blended environments, but not specifically among students with ASD. However, in this study, the population of students with ASD was the primary focus when examining satisfaction in learning environments, with the addition of distance learning environments. According to White et al.'s (2016) results, students with ASD satisfaction levels with blended course formats may differ in contrast to the general student population's lower satisfaction levels with blended courses. In my examination, satisfaction levels might have been different among students with ASD in online learning because it eliminates synchronous coursework, may lower frustration by reducing face-to-face interactions, allows flexibility with time restraints, and possibly removes some stimulations for sensory overloads. However, in my examination of satisfaction among students with ASD in postsecondary education settings, no significance was found. Present and past researchers provided limited information investigating online learning among students with ASD satisfaction in higher education, and online learning satisfaction. However, as mentioned above, only five participants attended distance learning environments, and no significance was found after performing the analyses.

Self-Efficacy and ASD

As stated in Chapter 2, Bradley et al. (2017) used SET among a general population to find that students had higher levels of self-efficacy when they had previously taken more than one online course in completing an online learning course successfully. However, students with no online course experience had lower levels of self-efficacy in online learning outcomes. Bradley et al.'s study did not include students with ASD. In my study, self-efficacy was examined among students with ASD in higher education institutions. Unfortunately, after performing analysis, no significance was found to support or extend Bradley et al.'s findings to the ASD population. Dryer et al. (2016) quantitatively explored factors influencing students with physical or sensory disabilities and students with mental health disabilities' academic performance in on-campus and online learning courses. The researchers compared motivation, quality of life, and academic achievement among 83 students with mental health disabilities and students with other disabilities. However, the researchers did not explore differences in self-efficacy between students in different learning environments. In this study, self-efficacy was explored in different learning environments among students with ASD (a recognized disability) but found no significance after performing analysis. Thus, the limitations of my study's examination of satisfaction and self-efficacy among students with ASD in postsecondary settings are discussed below.

Limitations of the Study

The most influential limitation of this study was the lack of participants. In this study, the responses and the total number of participants did not meet the desired amount

of 53 participants per group as disclosed by the G*Power 3 program. First, the original method of recruitment that was administered included social media platforms. With little success in obtaining participants, electronic communications were sent to higher education facilities disability service departments. After communicating electronically with disability services at multiple universities, community colleges, and technical and vocational schools, more recruitment methods were implemented to acquire more participants. Next, students with ASD no longer attending college were invited to participate. However, the response rate was low, and an incentive was included to acquire more participants. Finally, after receiving only a few participants from these recruiting methods more distance learning students with ASD were needed. Thus, the university participant pool was included as a recruitment method to obtain more distance learning participants. Subsequently, the number of participants still did not meet the requirement for statistical power creating an unequal sample size and increasing the likelihood of a Type I error occurrence. Threats to internal validity likely occurred, including participant response bias, the use of electronic surveys, and generalizability. The use of self-report measures and possible response bias may have occurred because the participant responses could not be verified and accepted as truthful. Furthermore, no significance was found when performing the initial analysis, and further testing was completed with bootstrapping, yielding no significance. Hence, I failed to reject the null hypothesis that when comparing self-efficacy as measured by the ASE, no differences exist between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. Moreover, I failed to reject the null hypothesis that no association

existed when comparing satisfaction levels as measured by the CSSQ, which stated there are differences between students with ASD in postsecondary on-campus-only, blended, and online learning educational settings. The low participant response rate to the surveys established a potential threat to this study's validity. Thus, this study is poorly generalizable to the ASD population.

Recommendations

As stated above, the results of this study will not aid in the possible development of educational support for students with ASD, which may have helped improve their academic achievement. Additionally, the findings of this study will not help institutions adopt curricula and instructional designs for meeting the needs of students with ASD to increase academic success rates. Since the majority of participants that responded only completed the demographic section of the survey, the likelihood of the measurement instruments being confusing or unclear was taken into account. Therefore, recommendations for further research of students with ASD in postsecondary learning environments include using more current measurement instruments to examine the constructs of satisfaction and self-efficacy in postsecondary institutions. Although the instruments retained reliability and validity, both measurement instruments were more than three decades old and included the ASE developed in 1987 and the updated CSSQ developed in 1971. Additional recommendations include using a mixed-method approach to obtain themes qualitatively because, as stated above, the majority of examinations of this population were performed using only qualitative methods. Moreover, the use of secondary research for data or archival data might provide an alternative to low response

rates. Furthermore, with the impact of the COVID-19 stay in place restrictions, in-person participant recruitment was not available. ASD conventions and events were canceled excluding, in-person recruitment as an option. Therefore, examining these constructs that have been proven to increase academic achievement by administering surveys through face-to-face interactions might produce more participants than this study's data method retrieval. Additionally, since this study was unable to obtain more than five distance learning students with ASD, further exploration of different learning environments is encouraged to aid in the advancement of locating the most beneficial postsecondary environment for increased academic achievement among the population. Moreover, the examination of these environments is encouraged because, as stated in Chapter 2, the challenges that students with ASD experience while learning on-campus may be reduced in blended or online learning environments.

Positive Social Change

This study could have contributed a potential impact for positive social change among students with ASD in higher education settings, among family members of students with ASD wanting to attend higher education environments, possibly aided in the development of academic structures to support the needs of students with ASD in higher education environments, and could have helped identify a preferred environment for students with ASD attending college with foundations on their level of self-efficacy and satisfaction among multiple learning environments. My study could have contributed to social change by advancing knowledge of the under-researched population of students with ASD attending higher education environments. The research could have promoted

social change by helping families of students with ASD transition to an environment best suited to meeting the educational needs of their students based on my study's findings of examining these students' levels of self-efficacy and satisfaction in the three different learning environments. Examination of these factors did not provide any significance or contribute to finding an opportunity to maximize academic success for students with ASD in higher education environments, thereby improving outcomes for these students as contributors to society. My study's implications for positive social change resided in its potential to increase understanding of differences in self-efficacy and satisfaction among students with ASD in on-campus, blended, and online learning environments. Clear comprehension of levels of self-efficacy and satisfaction in students with ASD within different learning environments could have proved helpful in identifying the most appropriate higher education environment to promote this population's academic success based on the constructs of self-efficacy and satisfaction in those different learning environments. Unfortunately, no significant differences were found while completing this study when examining self-efficacy and satisfaction among students with ASD attending higher education environments for possible generalization.

Conclusion

In this study, I examined if any differences existed in self-efficacy and satisfaction among students with ASD attending on-campus, blended, or distance learning environments. However, no significance was found due to a lack of statistical power and the number of participants. Thus, this study encourages further research among students with ASD in higher education environments to promote the success of this under-

researched population. With the ASD diagnosis rates increasing and more individuals with recognized ASD entering society, it is important to foster the success of these individuals, given the constructive contributions that they can make to their communities. The academic success of individuals with ASD may serve the greater good of humanity while helping to produce positive life outcomes for the ASD population.

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Appendix A: Social Media Research Advertisement

ASD in College

Research Volunteers Needed

(for the support of a doctoral degree)

I am looking for student's with ASD attending college or who previously attended.

Volunteers will complete surveys online in less than 15 minutes.

One survey will look into student's satisfaction in college environments.

The second survey will look into student's self-efficacy in college environments.

Click on the link to participate or copy and paste into browser.

The researcher will provide a summary of the results on the cooperating autism-related social media sites after completion and approval of the study.

Walden IRB Approval #05-27-20-0721361

Appendix B: Demographic Questionnaire

1. Have you been diagnosed with Autism Spectrum Disorder?
    - Yes
    - No

2. What is your specific diagnosis?

    _____

3. Are you a college student with ASD?
    - Yes
    - No

4. What is your age?
    - 18-24
    - 25-34
    - 35-44
    - 45-54
    - 55-64
    - 65+

5. Are you male or female?
    - Male
    - Female
    - Prefer not to answer

6. Which type of higher education environment do you attend?
    - On-campus-only
    - Blended Courses
    - Online Learning Only

7. How many months have you been attending an on-campus-only environment due to Covid-19?

    _____

8. How many months have you been attending a blended environment due to Covid-19?

    _____

9. How many months have you attended an online learning environment due to Covid-19?

   _____

10. How many months or years have you been enrolled in college?
- Months
- 1 Year
- 2 Years
- 3 Years
- 4 Years
- 5 Years
- 6 Years
- 7+ Years

Appendix C: Request and Permission for use of the Academic Self-efficacy Scale

(ASE)

Sent: Monday, October 29, 2018 2:46 PM
To: Library Staff
Subject: Availability

I am inquiring about the Academic Self-Efficacy Questionnaire by
Authors
Locke, Edwin A., Wood, Robert E.

Is this scale available for purchase?
How do I contact the publisher to obtain permission to use this scale if the item is not available for purchase? (The publisher is not listed on the ets site)

I am currently a doctoral student in the dissertation stage. I plan to implement the survey among college students in conjunction with another survey to obtain data for research.
I would be glad to answer any more inquiries if you have any.

Thank you

Sent: Tuesday, October 30, 2018 10:13 AM
Cc: Library Staff
Subject: RE: Availability [ref:774]

Thank you!

A PDF copy of the Academic Self-Efficacy Scale is enclosed. Please note that it may not be accessible to visually impaired users. Also, please see the terms of use.

If you have any other questions, do not hesitate to reach out. Best of luck with your research.

Thanks

Appendix D: Request and Permission for College Student Satisfaction Questionnaire

Sent: Wednesday, December 11, 2019 11:27 AM
Subject: CSSQ Form D

Dr.,

I am currently a doctoral student at Walden University. I am working on my dissertation, and I am e-mailing you to inquire about the possibility of using your instrument, the College Student Satisfaction Questionnaire - Form D - 1992 Revision? I have had difficulties finding the publication ownership, so I am contacting you.

Thank You

Sent: Friday, December 13, 2019 10:07 AM

Subject: RE: CSSQ Form D

Dear Cannda
Here you go
Best wishes
NB