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Understanding the Lived Experiences of Traumatic Brain Injury Students in Online Courses

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Walden University

College of Education

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Rebecca Owens

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Walden University
2020

Abstract

Understanding the Lived Experiences of Traumatic Brain Injury Students in Online Courses

by

Rebecca Owens

M.Ed., Strayer University, 2009

BA, Columbia University of Missouri, 2006

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Education

Walden University

August, 2020

Abstract

Many combat veterans are returning with what has been labeled the signature injury of nearly 2 decades of wars, traumatic brain injury (TBI). TBI injuries can alter cognitive abilities, memory, behavior, and emotions, all of which can vary in intensity and can affect learning. The purpose of this phenomenological study was to gain additional insight from the perspective of the veteran student on the learning challenges experienced in online classrooms when suffering from TBI. The conceptual framework for this study was (a) Bandura's theory of self-efficacy, (b) Zimmerman's theories on the relationship between TBI and learning, and (c) Schlossberg's transition theory. The research questions explored the lived experiences of TBI veterans who participated in online college or university courses, their perceptions of their learning experiences, and the use of technology in the classrooms. Data gathered from 6 participants during telephone interviews were evaluated for themes and patterns. The 3 themes identified were (a) the physical, emotional, and cognitive changes that these participants experienced as a result of the TBI, (b) the ways that these participants mitigated these changes in order to succeed in their online courses, and (c) the interactions that they described within the classroom. A recommendation resulting from this study was the need for higher education programs to address the unique learning needs of TBI students. Positive social change resulting from the knowledge obtained from the study can help educators and administrators adjust or create policies and programs to better assist TBI students in online classrooms.

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Dedication

First and foremost, I would like to dedicate this to my family, who supported and encouraged me throughout this endeavor and never lost faith. When I wanted to throw in the towel and walk away, each of you knew the right things to say, how to say them and when, to recalibrate and motivate me. I thank my friends for their patience after all of the "no-shows" and cancellations over the years, and for giving me the swift kicks and tough, unfiltered military style counseling I needed to stay on track with this goal; yes, those techniques are still effective and valued, my friends. Lastly, to my former Sailors. It was through your eyes that I was inspired, motivated and driven to be the absolute best version of myself, personally and professionally when I started this journey, and it continues on a daily basis – thank you. I love you all.

Acknowledgments

I would not have been able to complete this study or this degree, without the knowledge and guidance from the many exceptional Walden University Professors, Academic Advisors, and the members of my Dissertation Committee. Special thanks must go to my Mentor, Dr. Donna Russell, who knew all the right buttons to push to motivate and help me work through each stage of this dissertation. I was fortunate to have her in my corner, as her unique skill sets matched perfectly with my disabilities. It was serendipitous. It led to my success.

I also wanted to personally thank the volunteers who were brave enough to come forward and discuss their disabilities, and how they impacted their learning. This was not easy or comfortable, especially for my military brothers and sisters, who typically do not like to acknowledge physical and mental challenges. Your willingness to discuss the impact of your injuries not only assisted in this study but will provide valuable insight to other researchers in the future. I wish each of you the very best, and I truly admire your tenacity and drive to not only face the challenges of re-learning how to learn but pushing on to further your adult education and be the very best versions of yourselves. “Bravo Zulu.”

Table of Contents

List of Tables

Chapter 1: Introduction to the Study

The topic of this study centered around understanding the lived experiences of veterans who have suffered traumatic brain injuries (TBIs) during their time in service and developing an understanding of how their TBIs affected their learning abilities in online university and college courses. Exploration of this topic was important because there have been significant increases in the number of veterans with traumatic brain injuries entering online colleges and universities in the United States.

Additionally, methods for assisting TBI veteran learners with their learning endeavors are still being evaluated for effectiveness, both on-campus and online. Thorough research on the topic has revealed that few studies have been conducted from the perspective of the TBI veteran learners attending online courses. Their experiences and insight could offer valuable information to further the development and application of institution policies, course designs, and learning methodologies used to assist this group of special learners.

Lastly, the results of this study have potential social implications at the individual level, for other TBI veteran learners, researchers, teachers, and scholars. Academic institutions and organizations, in addition to policy administrators responsible for overseeing and enforcing The Americans with Disabilities Act (ADA) in educational institutions, may benefit from the students' perspective, and propose positive changes to promote effective learning. This chapter will review the background, conceptual framework, and the research design principles including assumptions, scope, delimitations, limitations, and the significance of this study.

Background

As a result of 17 years of war, the number of veterans with traumatic brain injury (TBI) has increased in the United States. McKee and Robinson (2014) identified that over 300,000 service members were diagnosed with TBI between 2000-2015. The Armed Forces Health Surveillance Center (AFHSC) conducted a 16-year study, from 2001-2016, which identified 276,858 active duty service members who received a diagnosis of TBI. This number does not account for reserve personnel who may have been temporarily activated at various periods during those years (AFHSC, 2017).

The Centers for Disease Control and Prevention (CDC, 2015) described what happens to the brain tissue when head injuries occur. According to the CDC, a TBI is a disruption of normal brain functions after experiencing a blow, jolt, bump, or a penetrating injury. The primary brain injury happens right after the impact and can cause physical alterations of the brain tissue however, more damage occurs internally as hours and days pass (National Academies of Sciences, Engineering and Medicine [NASEM], 2019). The secondary brain injuries occur hours or days later, often because of swelling, and can lead to damage on a molecular and cellular level (NASEM, 2019). These molecular and cellular damages, to include death of the cells, typically cause residual neurobehavioral and psychological comorbidities that can last for weeks, months, years, or indefinitely, depending on the severity (NASEM, 2019).

Different areas of the brain are more susceptible to TBI forces, as brain tissue can stretch, tear and impact boney protuberances in the skull (CDC, 2015). TBIs are not just bruises to the brain. These injuries impact functions at a molecular level, by stretching,

breaking, bruising, and sometimes killing neuro-networks. Secondary brain injuries, such as inflammation, can strangle cellular and molecular activities in the brain that can lead to further neuronal dysfunction and death (Hill, Coleman, & Menon, 2016). TBI injuries can impact cognition and behavior and can regress a person's functioning in these areas to near child-like levels, depending on the severity (NASEM, 2019).

TBI injuries as a result of combat differ from other brain injuries. Riedy et al. (2015) indicated that TBI from blast injuries, the most common type of TBI resulting from combat, could be fundamentally different than that experienced from falls or collisions, with regard to symptoms and lasting residuals. The TBI participants from this study reported high rates of loss of consciousness while being exposed to blast injuries, indicating that blast injuries caused a higher rate of loss of consciousness than nonblast head injuries; more than half of the participants reported exposure to multiple blasts.

Additionally, Riedy (2015) found from magnet resonance (MR) imaging that the most common pathological finding from this research, 51.8%, was to the T2-weighted hyperintense areas in the white matter in the brain. MR imaging abnormalities ranged from small areas of focus to affecting multiple areas of the brain and systems. This type of damage can result in chronic headaches, small vessel white matter disease, and multiple sclerosis (Riedy, et al., 2015).

There were also noted pituitary abnormalities in the form of lesions that were detected with imaging, with and without contrast (Riedy, et al., 2015). The lesions were nonspecific, but in this age group of participants, it could be attributed to TBI. This was relevant because, as discussed previously, blast injuries comprise the majority of the TBIs

for many of the TBI veteran learners. This particular study supports the potential critical impact for returning service members, as over half those studied (51.8%) demonstrated brain abnormalities from TBI blast injuries.

Riedy et al. (2015) also confirmed an association between TBI and pituitary abnormalities, with 29% of their military TBI participants showing these abnormalities, compared to the 2.4 % in the group without TBI. The pituitary gland controls several other hormone glands in the body, including the thyroid and adrenals (Riedy et al., 2015). The hypothalamus controls a large amount of the functions of the pituitary gland, and if damaged, can influence and alter the functions of temperature regulation, food, and water intake, sleep patterns, emotional behaviors, and memory (Chapman, 2017). These functions, if damaged or destroyed, could potentially affect learning abilities differently than the injuries to specific areas of the brain that have been previously associated with memory and learning.

Brain injuries can alter how an individual learns, making even simple tasks challenging and frustrating. Studies have identified a correlation between various designs of the online courses and the success of special needs learners, which included learners with cognitive issues due to TBIs. For example Lee (2016) found that providing online learners with open-ended tasks encouraged both social development and independent learning abilities. Grabinger, Aplin, and Ponnappa-Brenner (2008) found that support could be provided for learners with disabilities in online courses, and that flexibility could be designed within the course content to assist diverse students.

Grabinger, et al. (2008) found that using universal design for learning (UDL) with innovative technologies including, (a) providing communication in multiple synchronous and asynchronous forums, (b) providing multiple examples of learning through media such as YouTube, (c) scaffolding problem solving by integrating project management software and RSS applications and (d) using multiple ways for learners to respond in the online course such a chats, media design, and web design provided support for learners with cognitive impairments in online courses. Since TBI and posttraumatic stress disorder (PTSD) do share some similar symptomatology, a study by Boyraz, Granda, Baker, Tidwell and Waits (2015) was relevant. This study examined the effects of effort regulation and academic success on the relationship between PTSD and university and college enrollment. These students who rated high in self-regulation and effort regulation were more likely to stay enrolled and graduate (Boyraz, et al., 2015).

Previous studies have identified issues that student veterans experience in university and college courses but not from the perspective of the TBI veteran learners themselves. Ness and Vroman (2014) noted a significant gap in research relating to service members pursuing their postsecondary education, and how their TBI injuries altered their learning. Catalano‘s (2014) study explored how to improve online services for special needs students and, while not specific to veterans, the study did address TBI injuries and on-line learning services to include a discussion on students’ views of online learning platforms and methods. This study will develop new understanding of the experiences of TBI veteran learners in online courses and support the development of viable learning experiences for these special needs’ learners.

Problem Statement

The research problem this study addressed was the increasing numbers of TBI veteran learners attending online university and college courses, the need to understand their experiences in these courses, and to identify methods, programs, and policies that may assist them in their learning processes. As a result of the wars in Afghanistan and Iraq, military leaders have reported TBIs as the signature injury from this era of conflict with over a quarter of a million military service members diagnosed between 2000-2012 (Helms & Libertz, 2014). The Department of Defense compiled worldwide totals for the number of TBI injuries since 2000 encompassing all severities from not classifiable to penetrating injuries (Defense and Veterans Brain Injury Center [DVBIC], 2018). As of June 2018, there have been 383,947 TBI injuries reported from the Army, Navy, Air Force, and Marines (DVBIC, 2018).

In 2009, more than 500,000 veterans used education benefits to pursue higher education goals, and nearly 19% reported some sort of TBI (Betts, et al., 2013). In 2013, over 1,000,000 veterans from both the Afghanistan and Iraq wars, received educational benefits, and this number is expected to grow (Department of Veterans Affairs, 2016). More recently, the Department of Veterans Affairs (2017) estimated that nearly one million veterans used their Post 9-11 GI Bill education benefits to attend postsecondary academic institutions. However, according to Terry (2018), only 26% of veterans over the age of 25 have attained their bachelor's degree compared to 28% of the total population.

My inquiry in preparation for this study did not reveal any research addressing the online learning experience from the TBI veteran learner's perspective and this is where I have identified a gap in the current research. This research will fill this gap because the information collected will provide a unique viewpoint for the scientific and academic communities, and potentially identify programs and policies to enhance the learning experience for the TBI veteran learners in online classes.

Purpose of the Study

The purpose of this study was to understand the lived experiences of veterans with traumatic brain injury that have participated in online university and college courses. The qualitative methodology allowed me to gather in-depth information, to gain insight, and identify patterns and themes surrounding the experiences of student veterans. Through the phenomenological method, each student veteran was able to describe their individual experiences during their journey through the academic processes.

As previously mentioned, prior research has focused mainly on concerns about various programs and the processes that have not been working for the student veteran (Zinger & Cohen, 2010). Within those nonworking processes and programs, research has also focused on the success, or lack thereof, for the teachers working with student-veterans (Barnard-Brak, Bagby, Jones, & Sulak, 2011) leaving a gap in understanding the types of programs to increase success for this population. The information acquired through this study will add to and expand the existing literature by providing a unique perspective of the TBI veteran learner's academic experiences and highlighting those

student veterans who have accomplished their goals of receiving their degree following their injuries.

Research Question

My primary research question was What are the lived experiences of TBI veteran learners in online university and college courses? My secondary questions were; (a) How do TBI veteran learners perceive their educational experiences in an online course? and (b) How do TBI veteran learners perceive the utilization of interactive technologies in their online courses?

Conceptual Framework

This study was based on three distinct concepts including Bandura's concept of self-efficacy, Zimmerman's theories between TBI and learning, Schlossberg's transition theory and Vygotsky's sociocultural learning theory. These concepts were chosen due to their overlapping association between the processes and experiences of learning. A brief explanation of the concepts will be provided, with a more thorough and detailed elucidation provided in Chapter 2.

In the theory of self-efficacy, Bandura (1986) posited that when people felt that their actions could alter situations or events, they tended to have a positive feeling of self-worth, feelings of control over their surroundings and events, and could recognize these differences in themselves. In essence, self-efficacy involves a person's individual beliefs about their abilities and internal motivation, whether or not these beliefs are objectively true. TBI injuries, which alter behavioral and emotional traits in ways that are unique for each individual, also alter internal motivation and feelings of self-worth.

Therefore, and as studies indicated, the experiences of TBI veteran learners in their online environments will be closely intertwined with a sense of self-efficacy. Bandura's (1986) social cognitive theory identified self-efficacy as the foundation for human agency; without it, learning is restricted. Self-efficacy was used to understand the TBI veteran learner's perceptions of their own experiences in online courses. In this study, self-efficacy was understood through the interview questions, their narrations of their experiences, and the use of the participant's journal questions.

Zimmerman's (1995b) concepts of the specific relationship between TBI and learning was used in this study to define the relationship between the cognitive issues of TBI veteran learners in online courses including issues related to memory, attention, and the processes of self-regulation in online courses. Specifically, Zimmerman discussed a feature of self-regulated learning which included the cyclic processes of learning feedback loops to enhance the learning experience.

I used Schlossberg's (1981) transition theory to understand how the TBI veteran learners experienced their online courses, focusing on the integration of technology, the design characteristics of the courses and the interactions in the online courses. Schlossberg postulated that successful adaptation to a transition, which is defined as any event or nonevent that changes an assumption about oneself or the world, can be influenced by the characteristics of the transition, the characteristics of the pre and post transition, and the characteristics of the person experiencing the transition. Multiple factors can negatively or positively influence each stage of the transition, both internally and externally. Internal factors would include personal values, beliefs, health, or

standards, while external factors could include society, family, economy, employment, military, or academic institutions. I defined this concept through interviews and journal topics, as the participants were asked to consider their experiences in their online courses.

According to sociocultural learning theory the way an individual may view their own ability to thrive and succeed affects their learning abilities (Vygotsky, 1981). Sociocultural learning theory will help to explain the interactive processes between the TBI veteran learner's perception of self, and their ability to navigate the multitude of changes that occurred after their TBI injury (Vygtosky, 1983).

Online learning requires high levels of self-efficacy and self-regulation to be successful in academic endeavors. Change, whether it be personal or professional, can also alter self-perceptions about one's abilities, and for this study the theories defining these self-perceptions and experiences are closely intertwined. Disabilities that may compromise the levels of these characteristics can make learning difficult, in addition to the added challenge of learning through online methods (Zimmerman, 1995b). The purpose of this study was to understand the experience and perceptions of TBI veteran students taking college courses online.

To accomplish this, the student was required to recognize the need to alter learning strategies, possess the interdependence to act on that need, self-evaluate the learning effectiveness and, lastly make the necessary adjustments to fine tune their learning methods. The TBI veteran learner, in an online environment, may find these actions restrictive and challenging based, in part, to the combination of their injury and the limitations of the online forum. This concept was used in the development of the journal

topics which allowed the participants to define their specific learning experiences, as they related to their injuries.

Nature of the Study

I used a qualitative descriptive phenomenological study (Moustakas, 1994) and the generic method of data structuring and analysis to evaluate the results (Giorgi & Giorgi, 2003; Keen, 1975). Phenomenology was chosen to develop new understandings of the lived experience of persons who were going through the phenomenon to be understood. In a phenomenological inquiry, the person experiencing the phenomenon is asked to respond to interview questions and then to describe their experience, in detail, as a means to develop a rich understanding of the human experience (Moustakas, 1994).

The participants were recruited from two closed Facebook groups that were populated by veteran members from various locations in the United States and overseas. I conducted interviews by telephone and recorded the audio session for transcription. I opted for purposive sampling to obtain a diverse group of participants and the largest variance of experiences. I conducted semi structured interviews and used an interview guide to maintain consistency amongst participants. The questions were open-ended, as this form of interviewing enabled the participants to fully express their experiences in rich detail. I arranged three sets of data to be collected (a) an initial interview, (b) a follow-up interview, and (c) responses to journal topics. Using this phenomenological approach, I was able to address the research questions regarding the lived experiences of TBI veterans during their online learning.

Definitions

Below are definitions of the key concepts within this research that may not be well known to people not affiliated with the military and/or TBIs.

Blast injuries: For this study, blast injuries refer to injuries incurred from improvised explosive devices (IEDs), in addition to being in close proximity to other types of explosions. These injuries are caused by the shock waves, as the explosion releases huge amounts of energy. The variances in pressures (overpressure and under pressure) of the shock wave, including delayed waveforms from surrounding structures and objects, are the main mechanism for the blast injuries (Zhao & Wang, 2015).

Concussive injuries: Dash and Chavali (2018) noted that concussive injuries are a mild form of TBI, with symptoms that generally subside over time.

Improvised explosive devices (IEDs): According to the Department of Homeland Security (n.d.), an IED is a "homemade" bomb which can come in various forms and sizes and can be delivered by being carried by a person, attached to a vehicle, or placed/buried in the ground or on a structure.

Primary brain injury: According to Dash and Chavali (2018), a primary brain injury refers to the damage of the brain tissue from the transfer of kinetic energy.

Secondary brain injury: According to Dash and Chavali (2018), a secondary brain injury is a term used to describe, "the aggravation of TBI over subsequent minutes to hours as a consequence of various factors, such as hypoxemia,

hypotension, hypo-or hypercarbia, hypo-or hyperglycemia, hypo-or hyperthermia, and seizures" (p. 13).

TBI examination: For this study, this term relates to examinations conducted at hospitals, and includes diagnostic imaging tests (NASEM, 2019).

TBI field assessment: According to DVBIC (2016), several tests can be conducted in the field and after the occurrence of a TBI, including the Glasgow Coma Scale (GCS), and MACE: Military Acute Concussion Evaluation.

Traumatic Brain Injury (TBI): According to the Mayo Clinic (2018), TBI typically results from a violent blow or jolt to the head or body. This may or may not involve an object that penetrates the actual brain tissue. This type of injury can result in bruising and tearing of the tissue, and bleeding in the brain itself.

Assumptions

The qualitative phenomenological study provided me detailed insight into the learning struggles of the participants and helped me identify patterns and themes surrounding the challenges and successes of TBI veteran learners. This methodology allowed participants the means to describe their individual experiences during their journey through the academic processes. This phenomenological approach added to the existing literature by gaining a deeper, more visceral understanding of the learning challenges experienced by TBI veteran learners.

It was assumed that the design of the interviews would provide opportunities to understand the nature of the participants' experiences, and their personal experiences while engaging in online classes. Within this study, I assumed that the participants were

honest with their disclosures about their TBIs. Lastly, I assumed that the participants would be open and honest about how this injury may or may not have influenced their abilities to navigate the online learning environments.

Limitations of the study included the relatively small sample size, limited diversity of participants, as well as the bias of the researcher, as I, too, am a TBI veteran learner. Lastly, telephone interviews were used in place of video-teleconferencing. I did not have the benefit of observing facial expressions and body language during the interviews. LeBaron, Jarzabkowski, Pratt, and Fetzer (2017) noted that the analysis of audio and video can be both beneficial and detrimental. On one hand, the analysis of audio and video can assist the researcher by enabling triangulation across the modalities. Conversely, analyzing audio and video data can result in contradictory information. The interpretation of visual, non-verbal cues is dynamic and does not have universal meaning. They can be influenced by age, gender, culture, and life experiences, to name but a few examples.

Scope and Delimitations

The scope of this study was the in-depth perspectives, feelings, emotions, and thoughts of the TBI veteran learner, and their experiences with online learning forums. Understanding the insights from these veterans is essential, and will contribute towards providing quality online learning environments that can be easily navigated and understood by those suffering from TBI injuries in the future. This qualitative phenomenological study was fully described and explained during participant recruitment.

The study was delimited by the recruitment of six veterans, with a self-admitted diagnosis of TBI incurred while on active duty. These veterans participated in online university and college courses after their diagnosis of TBI. There was no restriction on race or age. Convenience-based sampling was used based on their response to, and acceptance of, the study recruitment flyer. Current active duty, retirees, and military reservists were included in the study. The delimitation was suitable due to the number of participants that fell within the range of six to ten participants. This delimitation was recommended and can improve the validity of the study, according to various research methodologists (Patton, 2015).

Limitations

Limitations of this phenomenological study were important to note as they may further assist future researchers. The limitations included time constraints, small study size, lack of funding, no medical diagnosis of TBI since the participants were self-admitting, and the possible mental anguish and embarrassment for the participants. Time constraints applied to the veterans who, after getting out of service, were either injured too badly to work or had assimilated into the civilian employment sector.

Regarding the sample size based on the six participants, there was a narrow, albeit full, perspective of the impact of TBI on online learning, despite the small number. There was no funding for this study, due to the nature of its use for dissertation purposes. Since participants were self-admitting their TBI injuries, no medical documentation was obtained, and no formal doctor's diagnosis was required as a means to verify the disability. Lastly, because many of the TBIs from recent wars were caused by IEDs, there

could also be physical and mental trauma associated with the injuries. Discussing the events that led to the TBI could have potentially caused emotional stress for the participants and having to admit difficulties and challenges with academics (or failing at them) could have been embarrassing and frustrating.

Significance

Previous studies have identified issues that student veterans have experienced while attending university and college courses but not from the perspective of the student veterans themselves. Ness and Vroman (2014) noted a significant gap in research concerning how TBI impacted the learning behaviors among service members enrolled in post-secondary education. Catalano‘s (2014) study explored how to improve online services for special needs students and, while not specific to veterans, the study did address TBI injuries and on-line learning services and included a discussion on students’ views of online learning platforms and methods.

Since TBI and PTSD do share some similar symptomatology, a study by Boyraz et al. (2015) was relevant. This study examined the potential mediating effects of effort regulation and academic success on the relationship between PTSD and university and college enrollment. The study found that students who were able to self-regulate had higher graduation and enrollment rates.

Lee (2016) found that providing online learners with open-ended tasks encouraged both social development and independent learning abilities for the learners. Grabinger, et al. (2008) noted that accommodations for learners with disabilities in online courses can be incorporated into the course design itself, and by applying innovative

strategies and the necessary flexibility, diverse students can be supported. They discovered that using UDL with innovative technologies provided these students with the necessary academic support to facilitate productive learning. Some of the design processes included:

- Providing communication in multiple synchronous and asynchronous forums.
- Providing multiple examples of learning through media such as YouTube.
- Scaffolding problem-solving tasks and lesson by integrating project management and Really Simple Syndication (RSS) applications.
- Using multiple ways for learners to respond in the online course such as chats, video teleconferencing, and multimedia web designs.

These variations within the online learning platform provided support for learners with cognitive impairments.

Understanding the experiences of TBI veteran learners in online courses will support the development of viable learning variations for these special needs learners and can potentially benefit other special needs learners in the future. Developing innovative new lessons and course designs by integrating social media and assistive technologies that support special needs learners could potentially enhance the educational experience for non-traditional and first-time online learners, as well.

Summary

This chapter introduced the types and causes of TBI often associated with military members and discussed some of the cognitive issues that brain injuries can produce. Next, I discussed how these injuries can impact cognition and memory, making the

process of learning a challenging one. Coupling this with online university and college courses, I discussed the possible difficulties that a TBI veteran learner may encounter within this learning forum. These problems were addressed, discussed, and were supported by research. I introduced my research questions, reinforced my theoretical and conceptual framework, and explained the reason behind this phenomenological study. Lastly, I included my assumptions, scope, delimitations, limitations, and the significance of this study.

The impact of TBI on military veterans is still being explored. As this is the signature injury for the wars and conflicts occurring since the 1990s, the long-lasting effects are not well known although, much has been learned as a result of professional football head injuries. As veterans leave the service and attempt to make use of their educational benefits, many opt for the convenience of online learning, especially if they are suffering from other physical disabilities. This study's findings may provide academic institutions with insight and information on how to adjust their online learning platforms to better assist TBI veteran learners in their learning endeavors and academic goals.

Chapter 2 is a review of the current literature on TBIs, cognitive learning challenges, and learning methods for those with cognitive issues. Additionally, this chapter discusses learning theories, how TBI veterans functioned in a classroom environment, and the difficulties they experienced. Lastly, conceptual foundations that are pertinent to this study will be described.

Chapter 2: Literature Review

Introduction

The purpose of this study was to understand the lived experiences of veterans with TBI that have participated in online university and college courses. I used a phenomenological methodology to understand the experiences of these students. My primary research question was What are the lived experiences of TBI veteran learners in online university and college courses? My secondary questions included How do TBI veteran learners perceive their educational experiences in an online course? and How do TBI veteran learners perceive the utilization of interactive technologies in their online courses? This chapter includes a full review of relevant research literature on the topics of the nature of cognitive functioning for TBI veteran learners, the characteristics of learner responses in online courses, the design and implementation of online courses, and the interactions of learners in online courses.

Literature Search Strategy

The primary website used for the literature in this study was Google Scholar and the Walden University and Library. Terms and phrases used for the literature searches included *TBI injuries in the military, TBI impact on cognition, TBI and education, TBI and online learning, Challenges of TBI and learning, Social learning theory, American Disabilities Act and education, Phenomenological research, Number of military TBI injuries, 2014, 2015, 2017, 2018, 2019, Area of the brain affected by TBI, Training for educators on TBI injuries, University and college accommodations for those with disabilities, Self-regulated learning, Self-efficacy and learning, Technology in education*

for TBI veteran learners, Universal Design for Learning for TBI veteran learners, and *Course designs for TBI veteran learners.*

Conceptual Framework

This study was based on three distinct conceptual bases, (a) understanding the learning processes of TBI veteran learners based on Bandura's theory of social learning, focusing on the concept of self-efficacy (Bandura, 1986), (b) defining the relationship between the cognitive issues of TBI veteran learners in online courses including issues related to memory, attention, and the process of self-regulation in online courses (Zimmerman, 1995b), (c) understanding issues relevant to online pedagogy of teaching TBI veteran learners as based on Schlossberg's transition theory (Griffin & Gilbert, 2015) and, (d) Vygotsky's theories about altered development, as it relates to mental disorders (Vygotsky, 1993), drew interesting parallels to many of the symptoms that TBI veterans experience.

Self-Efficacy

Self-efficacy can be defined as one's belief that they can be successful when carrying out a task. (Cambridge Dictionary, 2018). Concerning education and learning, this internal motivation and belief that one can accomplish tasks is an integral part of the learning process. Head injuries can sometimes adversely influence internal confidences and coping skills and make the learning process not only unpleasant but extremely challenging for the learner (Ness & Vroman, 2014).

In a study by Ness and Vroman (2014), 192 service members from eight regionally diverse universities were observed in a cross-sectional study that evaluated

relationships between the physical residual injuries of TBI, the mental disability of PTSD, and self-regulated learning. The study revealed that these students showed lower academic self-efficacy. They identified self-efficacy as a predictor of one's academic success and found that those who had low self-efficacy required additional self-regulation strategy and metacognitive strategy instruction to assist with promoting increased awareness, and control of behavioral processes. This research related to my study because TBI often affects a person's motivation and internal drive, both of which are necessary for self-efficacy. The research leads to a new understanding of the relationship between efficacy and learning for students with TBI.

Coping mechanisms and skills are used to assist with overcoming adversity and challenges. In the study by Scheenen, van der Horn, de Koning, van der Naalt, and Spikeman (2017), the researchers explored the relationship between coping styles and self-efficacy following mild TBI. The results indicated that participants who had increased self-efficacy also had active coping styles, and those who possessed decreased feeling of self-efficacy had avoidant and passive coping styles. Low self-efficacy can promote the interpretation of problems and challenges as threats. This negative connotation, coupled with the lack of faith that he or she possesses the abilities to meet and surmount the challenges, can cause weak commitments to goals.

More importantly, it can also cause the person to give up on goals altogether. Understanding how coping styles and self-efficacy interact and conjoin may assist with treatment and intervention protocols. Interventions could be designed to help increase and

improve the person's feelings of self-efficacy. If one's own coping abilities can be increased and adapted, so too will the motivation to act increase (Bandura, 1986).

Rationale. These studies were relevant because self-efficacy plays such an important role in online learning environments and, as indicated, is a predictor of academic achievement. Those suffering from TBI may struggle with self-efficacy and require additional guidance and motivation. In the typical on-line forum, the student may appear to be ill-prepared for the class or not interested in learning when, in fact, he or she is hindered by the residuals of the brain injury, to include a decline in, or even the lack of, self-efficacy. Through this phenomenological study, the TBI veterans' perceptions and descriptions of their emotions, thoughts and feelings about their online learning platforms, teachers, and institutions will hopefully develop a full picture of what it is like to learn, on a daily basis, with their TBI. Viewing their learning processes through this lens will assist in the development of programs to better assist future TBI veterans with their online learning and academic goals.

Self-Regulated Learning

Zimmerman (1995a) noted that there had been little research and study on the topic of self-regulated learning. Self-regulated learning refers to the student's ability to become leaders in and masters of their learning abilities. The self-regulated learner can recognize their knowledge base, is proactive in seeking new knowledge, and diligent to overcome challenges in their learning regimen. Facets included metacognition, motivation, and behavioral processes that enabled the learner to navigate their learning initiatives. These processes, which tend to define and bracket self-regulated learning, are

the very same processes that are often affected by TBI injuries, as my research has indicated.

Boyraz et al. (2015) studied the correlation between the varying degrees of PTSD symptoms and how the symptoms affected self-regulated learning. The study consisted of 928 first-year university and college students, with 484 reporting some form of exposure to traumatic life events. PTSD was diagnosed in 12.4% of the participants. The longitudinal study discovered that students who reported high levels of PTSD symptoms also had lower levels of effort regulations, which impacted second-year enrollment due to first-year GPA scores. The results were relevant to my study because of the similarities of symptoms between TBI and PTSD, and their relationship to self-regulation.

Rationale. The strong correlation between various mental disorders and TBI has been the topic of many studies, and with veterans, TBI and PTSD (Boyraz et al., 2015), along with depression, anxiety, pain and sleep disturbances (NASEM, 2019) tended to coexist and overlap. The research obtained from Boyraz et al. (2015) was pertinent because it highlighted the effects of PTSD on academics, self-regulation, and self-efficacy. TBI and PTSD share similarities with regard to minimizing self-regulation (Boyraz et al., 2015), and it is feasible that methods used to assist PTSD veterans with self-regulation may also benefit TBI veterans.

Transition Theory (Schlossberg)

Schlossberg (1981) posited that people vary greatly in the method and way they adapt to change. There are multiple factors involved in these processes, with the primary factor being the individual. Schlossberg pointed out that a person's stage in life can alter

adaptability, even if they are facing a repeated change and one that they experienced previously. Schlossberg developed this theory of transition through the study of other theories on the topic, and by expounding on individual, life span, transition, stage, and age continuum views.

One of the focal points to Schlossberg's (1981) theory is that it is not the transition, itself, that amasses the conflict, but how the transition merges with a person's individual state and situation at the time. In effect, it is the person's perceptions of themselves and the world around them, along with the new behaviors required to make the transition fit that can cause stress (Schlossberg, 1981). Adaption can be viewed as possessing the resources necessary to allow the change to be smooth. This is particularly important for TBI veterans who may be struggling with their perceptions of themselves, pre-and post-TBI, and being unaware of resources that can assist them. Lack of resources to help with decision making can create uncertainty, and uncertainty often manifests stress.

Schlossberg (1981) identified transitions as falling within a set of variables which are comprised of; personal and/or professional role changes, source, timing, onset, duration of the event(s), and the effect and degree of stress. Each of the facets have their own degrees of uncertainty during the transition phase. The factors that can alter a person's adaptation abilities can include their environment, their personal support systems, organizational support systems, their physical location, and their individual characteristics. A person's individual characteristics can include their mental capacity,

social skills, gender identification, age, health, socioeconomic status, race/ethnicity, and individual values.

For the TBI veteran most, if not all, of these characteristics will play a role in how well they adapt after their injury. If their mental capacity has been compromised by the injury, this can negatively impact their social skills, health, socioeconomic status, and even their values. Their adaptation to the injury, and its residuals, will rely heavily on their individual and organizational support systems. Research supported the notion that academic institutions should, therefore, understand that this disability and the veteran's ability to transition through the changes, will rely on programs that support not only learning but the veteran's ability to positively self-identify with themselves and develop positive self-perceptions (Schlossberg, 1981).

Sociocultural Learning Theory

One of Vygotsky's theories played an important role in this study, and it is found in his general genetic law of cultural development. In this theory, Vygotsky (1981) posited that internal thought transformed the processes of voluntary attention, memory, the formation of new concepts, and the development of choice. More importantly, social relations or relations among people, "genetically underlie all higher functions and their relationships" (Vygotsky, 1981, p. 163). Essentially, how the TBI veteran views his or her own disability and limitations will impact their ability to learn.

Wertsch and Tykviste (1992) amplified this notion, and explained that mental functioning did not occur, first and foremost, within the individual. Rather, the mental processes occurred between people on an intermental plane. This notion was relevant to

the online learner who suffered from TBI, to include residual and comorbid mental health disabilities, and may have experienced social isolation. This concept is applicable and relevant, as it applies to the TBI learner's ability to connect with their teacher, and other online learners and if compromised, may prove to be an important facet to the learning support required for the TBI veteran.

My research indicated that students with TBI injuries may benefit from online courses which offer more than one method of learning and even allow the student a choice of learning methods. By providing audio, video, and text, simultaneously, with which to exchange and share information, ideas, knowledge and thoughts, the student's mental processes, and the connection between the veteran and others, can increase exponentially. Additionally, the TBI veteran students seemed to benefit from one-on-one additional contact, in the form of mentorship, tutelage, and guidance.

Literature Review Related to Key Concepts

The review of literature focused on three major topics related to the conceptual framework including (a) the individual learning issues relevant to TBI veteran learners; (b) the relevant issues related to the interactions of learners in online courses and; (c) the issues related to the design and implementation of online courses. Through further exploration of these topics, supported by scientific research in the fields of TBI injuries and learning processes, perhaps programs can be created and adopted to better prepare TBI veteran learners for positive learning experiences in online learning forums. Research showed a disparity between the TBI veteran learner's learning experience online versus on campus, and this may be due, in part, to the lack of understanding of the

issues of self-efficacy, self-regulation, and the transitional experiences of the TBI veteran learner.

Past and current research identified the inter-related effects of TBI and learning, and many of the challenges that are experienced by the TBI veteran learner. One such study by Olsen, et al. (2014) indicated that people with TBI demonstrated an increased dependence on adaptive task control processes in certain areas of the brain, as evidenced by functional magnetic resonance imaging (fMRI). Adaptive and stable control processes were seen on the images, and injury-specific compensations occurred in everyday life situations, including navigating educational activities. Research on TBI, TBI veteran learners in both online and campus environments, and the uniqueness of the challenges TBI veteran learners experienced continue to be an evolving topic as new studies become available.

Mechanism of Injury

McKee and Robinson (2014) studied military related TBI and its effect on neurodegeneration. Evidence in this study, and others, indicated that just one instance of TBI can result in gray and white matter atrophy. In the long term, this form of injury can be the onset to, or the acceleration of, neurodegeneration, which can lead to Alzheimer's disease, motor neuron disease, and chronic traumatic encephalopathy. The effects of military related TBIs are slightly different than TBIs associated with sports, primarily because veterans received TBIs from not only sports, but combat, extreme physical trials and training, motor vehicle, aircraft, boat accidents, and explosive blasts. Complicating

and compounding the issue was the discovery that multiple TBIs over time, with and without the loss of consciousness, exacerbated symptoms (McKee & Robinson, 2014).

Blast injuries impact the brain a bit differently than falls or other strikes to the head. Explosions produce blast winds that act like multiple, severe concussions hitting the head and brain over the course of microseconds (McKee & Robinson, 2014). The coexistence of TBI and PTSD, primarily due to frontal lobe dysfunction, negatively impact working memory, complex decision making, judgment, planning, multi-tasking, executive functions, impulsivity, and emotional liability (McKee & Robinson, 2014). Difficulties can also exist with sleeping and social behaviors that can have residual impact on daily life functions (NASEM, 2019, pp 45-46).

Lindquist, Love, and Elbogen (2017), in their study of post 9-11 military veterans, reported that half of those studied (N=1,388) reported multiple head injuries during their time in service, to include TBI blasts, objects hitting their head, and falls. Those with multiple head injuries had higher rates of PTSD, depression, back pain, total body pain, and suicidal ideations. The AFHSC (2017) data on the number of service members who received a diagnosis of TBI while in the military adds to the importance of my study, as many active-duty members are also online students.

TBI injuries seemed to occur often with military personnel due, in part, to the environments that they are exposed to daily. There are many active-duty military members who continue to serve with this injury, and it is not restricted to veterans who have retired or are discharged after their active duty obligations (AFHSC, 2017). With TBI veterans being diagnosed almost daily, and as the wars in the Middle East continue,

the numbers will increase. As these Veterans continue to serve or work towards transitioning from the military to the civilian sector, the pursuit of additional education will be a likely route (Lindquist et al, 2017; McKee & Robinson, 2014). Educational institutions must be prepared to assist those with this form of disability and have programs in place to address their special learning needs, which includes educating the educators.

Special Needs Students

Veterans, especially those returning from combat, may find online learning convenient because of the flexibility it offers. If they are experiencing mental and physical ailments, it could potentially be easier for them to learn in the comfort of their own home. However, the studies discussed, up to this point, have indicated that TBI injuries, to include comorbid mental health disabilities, impact motivation, self-efficacy, cognition, and memory abilities. The research leaned towards the notion that online forums must be suited to the veteran's disabilities for them to succeed. For example, Hembrough, Madwell and Dunn (2018) conducted a case study on veterans' preferences of attending courses online or on campus. The researchers noted that veterans who have deployed and faced combat are likely dealing with combined psychological and medical issues, and that these issues are contributing factors in their decisions to attend online versus on campus courses (Hembrough et al., 2018).

Interestingly, Hembrough et al. (2018) discovered that veterans with TBI and/or PTSD preferred the traditional university and college courses over online learning. One of the primary reasons noted by the study participants was the connection they felt they

had with their peers and their teachers. Online education relies on self-motivation and time management, and these factors can be dramatically influenced by TBI injuries. This may explain the veteran's preference for campus learning, as they may feel that the face-to-face interactions with teachers and other students boosted these traits and assisted them with completing their tasks (Hembrough et al., 2018).

This method of engagement can also afford the teacher a platform from which he or she can help motivate, guide, prompt, and mentor the TBI veteran learner using a virtual face-to-face interactions (Hembrough et al., 2018). For example, this may include offering more video lessons, which the student can replay as often as needed to grasp the material. Offering video teleconferences with the teacher weekly could boost the TBI veteran's confidence with the material, provide an opportunity to discuss problem areas, and offer a feeling of connection.

A study by Canto, Chesire, Buckley, Andrews and Roehrig (2014) included 73 practicing school psychologists with membership in the Florida Association of School Psychologists who completed open-ended online surveys to record their experiences with students who suffered from TBI. Although 100 percent of those surveyed indicated that they had received some form of training for working with TBI sufferers, only eight respondents stated that they were comfortable working with these students.

Catalano's (2014) study explored how to improve online services for special needs students and, while not specific to veterans, the study did address TBI injuries and on-line learning services including a discussion on students' views of online learning platforms and methods. TBI veteran learners, and TBI veteran learners with mental health

disorders, have unique learning needs due to the areas of that brain that were injured. In addition to the brain injury, many can also suffer from a combination of mental health disabilities and physical disabilities which require additional assistance or tutoring to further guide the learning processes. Research discussed thus far has indicated that by recognizing the processes of campus classrooms that appeal to the TBI veteran learner, educational institutions can design innovative programs and processes that offer similar experiences and enhance the online learning environment.

Online Learning Environments

Studies have identified the effects of TBI on online learners, and since TBI and PTSD do share some similar symptomatology, a study by Boyraz et al. (2015) was relevant. This study examined the interceding effects of effort regulation and academic success on the relationship between PTSD and university and college enrollment and found that students who were able to self-regulate had higher success rates in terms of graduation and reenrollment. Effort regulation, or self-efficacy as noted by Zimmerman (1995b), were tied to academic success, and these two important internal motivators are currently being altered by TBI, and the residuals of TBI, in ways that researchers are still attempting to understand.

In a study by Norman et al. (2015), the researchers studied the perceptions of student veterans and their perceived barriers to achieving academic goals. The participants were canvassed from local campuses, community centers, and the local Department of Veterans Affairs (VA) hospital and outpatient clinics. Eligibility requirements consisted of enrollment in higher education, use of the GI Bill, and military

service during Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). A total of 31 veterans partook in the study, with 24 veterans in focus groups, and seven veterans individually interviewed (Norman et al., 2015). The veterans, half of whom endorsed a history of TBI, indicated that mental and physical health problems were a barrier to attaining academic goals. They found that only a few participants in the study (n = 4, 12.9%) reported positive involvements with on-campus disability services, and none of the members reported accessing or using on-campus mental health services. It is interesting to note that none of the members accessed the mental health services although, this could be attributed to several factors that are not clearly defined but are certainly of concern. This study, as it defines the institutional issues relevant to TBI veteran learners, is important to my study, and supports the intricacies and the complications of TBI residuals, and how these issues can negatively influence learning. Norman et al. (2015) concluded that a one size fits all assistance program for these learners would not be helpful due to the variances in mental and physical comorbidities and severities.

In a study by Ness and Vroman (2014) 192 enrolled service members from eight regionally diverse universities were observed in a cross-sectional study that evaluated relationships between TBI, PTSD, and self-regulated learning. The study revealed that these students showed lower academic self-efficacy. They identified self-efficacy as a predictor of one's academic success and found that those who had low self-efficacy required additional self-regulation strategy and metacognitive strategy instruction to assist with promoting increased awareness, and control of behavioral processes (Ness &

Vroman, 2014). This research related to my study and supported the relationship between efficacy and learning for students with TBI.

Mental and physical disabilities can have a negative bearing on the learning process. Academic institutions offer disability services, but the type of services offered may not necessarily meet the actual needs of the student. TBI veteran learners often have intertwined physical, mental, and cognitive disabilities, as described by numerous research studies (Ness & Vroman, 2014; Boyraz, et al., 2015; Norman et al., 2015). This combination of disabilities may not necessarily fall within a standardized disability assistance program structure provided by academic institutions and may require a more individual approach based on the TBI veteran learner's specific needs (Ness & Vroman, 2014; Boyraz, et al., 2015; Norman et al., 2015).

Post-Secondary Education

Boyraz et al. (2015) studied the correlation between PTSD symptoms and self-regulated learning. The study consisted of 928 first-year university and college students, with 484 of whom reported some form of exposure to traumatic life events. PTSD was diagnosed in 12.4 % of the participants. The longitudinal study discovered that students who reported high levels of PTSD symptoms also had lower levels of effort regulations, which impacted second-year enrollment because of their first-year GPA scores. The results were relevant to my study because of the overlapping symptoms of TBI and PTSD, and the effect these disabilities had upon self-regulation.

A study by Hendricks et al. (2015) researched university and college students who participated in Project Career, which was a program designed to support TBI veteran

learners. This particular application was developed to assist TBI veterans develop career skills through the integration of cognitive support technologies (CST) to include specific applications for mobile devices, but success of the application showed future promise for other assistive and adaptive technologies. The study included 56 university and college students with TBI, with 25 of the students reported as being military veterans.

Using inferential statistical analysis, they found that productive learning strategies were increased among the TBI veteran learners using CST (Ness & Vroman, 2014). The participants showed an increase in positive attitudes, were more social, more independent, and reported improved experiences through the use of the technology. This research was related to my study as it identified the potential to increase TBI veteran learners' social and learning responses using specific technologies integrated into a learning environment. Ness and Vroman (2014) noted a significant gap in research about how the residuals of TBI affect the learning behaviors among service members enrolled in post-secondary education.

Learning technologies, as evidenced by the positive responses from the CST (Ness & Vroman, 2014), can be beneficial to students who may require additional academic, social, and emotional support while attending university and college courses. Because TBI residual issues are not confined to only physical disabilities, research suggested that the topic of emotional, behavioral, and cognitive issues must also be addressed when developing support programs (Ness & Vroman, 2014). Self-regulation was often affected by TBI, in addition to the affects from various associated mental health disabilities that co-existed with the TBI injury.

Research strongly supported the benefits from the inclusion of multiple cognitive support therapies built into the design of TBI learning programs (Boyraz et al., 2015; Hendricks et al., 2015). My study filled a gap in the research by posing questions on the TBI veterans' use of technology, their interactions with the various design features in their online courses, and the interactions with teachers and students using online technology, while mitigating their respective TBI symptoms. By allowing the TBI veterans to define their own learning experiences, to richly detail their TBI symptoms and what those symptoms do to their mind, body, and sensory abilities, this study defined new understandings of how these aspects are described and experienced by TBI veteran learners.

Design of Online Courses

Course design, especially in an online learning environment, is an important focus in assisting and ensuring success for special needs learners. Lee (2016) found that providing online learners with open-ended tasks encouraged both social development and independent learning abilities. Grabinger et al. (2008) found that the accommodations for learners with disabilities in online courses should be designed with the incorporation of flexibility to support the diverse needs of these students.

Glang, McCart, Moore, and Davies (2017) noted that the school psychologists they surveyed had low levels of familiarity and apparent preparedness to work with TBI veteran learners. This study focused on school psychologists who were employed in public schools and working with children who suffered from TBIs of various severity. The school psychologists were in a unique position to guide educators about services that

would be beneficial to TBI learners and which would assist them in their educational needs. Glang et al. (2017) discovered that nearly 83% of the respondents felt that the training received was insufficient to work with this group of students. Additionally, the program directors and interns surveyed stated that none of the school psychology graduate programs they attended had any courses specific to TBI and that most programs only offered a 60-90-minute lecture on the topic.

Although this study did not address how the psychologists interacted with the students or with TBI veterans, the information is relevant to my study. If, as this study indicated, psychologists did not feel prepared or knowledgeable about their TBI training and most graduate programs did not dedicate time for this topic, educational organizations and TBI learners will ultimately suffer (Glang et al., 2017). On a larger and broader area of concern is the fact that none of these psychologists were graduating with sufficient knowledge and skills to confidently address and treat TBI students, nor would they be prepared to assist faculty should their employment be within any educational or academic system. The topic of TBI training for academic staff is an important facet of my study that will be further discussed in Chapters 4 and 5 with recommendations to better assist TBI veterans with their learning programs.

Williams (2017) explored the topic of TBI injuries and online learning from the teacher's perspective. In this study, the participants agreed that the online learning environment needed to be changed to support the TBI veteran learner (Williams, 2017). While the TBI veteran learners agreed that online learning was convenient, it did not assist with their motivation and self-directed learning. The participants acknowledged

that their respective experience and knowledge, as the teacher, played a role whether the student's online experiences were positive or negative. Expounding on this, the participants admitted that their limited knowledge of the online platforms also played a role in either enhancing or degrading the learning experiences. The study confirmed that TBI veteran learners had specific needs in their respective online learning environments, and when those needs were not met, self-directed learning suffered greatly (Williams, 2017).

Teachers played a major role in a student's online experience and research has indicated that there are no standardized or mandated training on how to develop processes to assist the online TBI veteran learner (Glang et al., 2017; Williams, 2017). If a TBI veteran learner was struggling in their online course, they could opt to self-disclose their disability to the teacher or seek assistance through their school's disability office. Each school has their own process for assessing and assisting students with disabilities however, it is generally ill advised to self-report one's disability to a teacher or professor (U.S. Department of Labor, n.d.).

If the teacher is knowledgeable of TBI learners' needs, has the flexibility to reconfigure the online lesson(s) to meet the TBI veteran learner's needs, and will work with the TBI veteran learner, studies have indicated that this supportive mentorship is conducive to learning. However, the studies discussed previously have also indicated that colleges' disability programs have mixed reviews from the TBI/PTSD learners and, often times, students with these disabilities do not seek help from these designated offices (Glang et al., 2017; Williams, 2017).

Understanding the design of online courses and how the designs help or hinder the learning experiences of TBI veteran learners is an important consideration for this study. The information gleaned from these TBI veteran learners' experiences, as they compare and contrast their online learning experiences using a phenomenological approach, will add valuable data to research community. The results of this study could potentially enhance the knowledge base for course designers, academic administrators, disability offices, and culminate with better assistance for future TBI veteran learners.

Universal Design for Learning (UDL)

A critical aspect of understanding the design parameters for supporting all students in online courses is the universal design for learning. Evmenova (2018) found that using a universal design for learning with innovative technologies, to include; (a) providing communication in multiple synchronous and asynchronous forums; (b) providing multiple examples of learning through media such as YouTube; (c) scaffolding problem solving by integrating project management software and RSS applications and; (d) using multiple ways for learners to respond in the online course such chats, media design, and web design provides support for learners with cognitive impairments in online courses.

Evmenova (2018) noted that UDL is built on redundancy, encompasses multiple means of engagement and representation, and has multiples methods of action and expressions. In layman's terms, these processes can be represented by the use of multiple ways to motivate students, the use of different methods to present the learning content, and lastly, allowing students the means to demonstrate what they have learned in several

different ways. The benefits of this philosophy include the teacher's abilities to assess students and build flexible choices that accommodate them (Evmenova, 2018).

By using the UDL framework, students possessing any type of learning disability have a better opportunity to have those issues addressed, as they arise. The UDL cycle includes the implementation of lesson structures, noting what worked, what did not and why, and the flexibility to alter the lesson to maximize the students' learning (Evmenova, 2018). This dynamic cycle tailors the instruction to the student's abilities, rather than separating students into special needs classes, and teaching them in segregation.

Gritful-Freixent, Struyven, Verstichele and Andries (2017) in their study of UDL in higher education, noted that the use of UDL was beneficial to students with learning disabilities but only if the students were able articulate their learning needs. To accomplish this, educators must know what questions to ask. Most students must self-identify their disability, provide the required documentation of their disability, request for specific accommodations, and then wait for the lesson adjustments to be made. This method is referred to as the accommodation approach and it relies on the student's ability to describe what they need in order to learn (Gritful-Freixent et al., 2017).

Frost and Connolly (2018) discussed the possibilities of using UDL and the Return to Learn protocol for students who were recovering from a concussive injury. This protocol showed promise for elementary and high school students however, it proved challenging to implement for the postsecondary student. Frost and Connolly (2018) explained that the protocol required continual monitoring, which was not typically available in university and college environments. Using a UDL framework, with teachers

who are committed and knowledgeable on its tenets, learning accommodations can be planned for in advance. The structure and design of the course anticipated what the students would require, in the form of accommodations and support for their lesson. The course design implemented multiple teaching methods (verbal, audio, video, and mixed), reduced multitasking activities, and minimized lessons, tasks, and tests into smaller sections.

Concussed students often require ongoing support, to include prompts and reminders, and detailed feedback both orally and in writing (Frost & Connolly, 2018). Frost and Connolly (2018) indicated that the UDL framework may not be productive for adult learning institutions however, as more and more people turn to online learning, educators will potentially be faced with the challenge of teaching adults with a wide range of disabilities, including TBI. Additionally, technology has made major advances since 2018, and these advances have potentially eased the burden of the UDL framework. Recently, the 2019-2020 global pandemic challenged educators around the world to devise creative methods for teaching students of all ages, and with all manner of disabilities, in online classrooms. Although this crisis necessitated expedience and the programs may not be perfectly crafted, it does substantiate that online learning is a significant aspect of education today.

Mental functioning is altered with a TBI injury, and this functioning can range from mild, to extremely severe (NASEM, 2019). How a person views himself or herself can often alter how well they interact with the challenges of everyday life. This is also applicable to how they view themselves absorbing and learning new material. Another

factor for consideration is how the TBI veteran interacts with the learning platform, the instructor, and the other students. If the residuals of the TBI influence the ability to interact with others, the online interactions may also be hindered (Wertsch & Tykviste, 1992). This phenomenological study allowed the participants an opportunity to express their feelings and thoughts about their virtual classroom interactions, and how the interactions (or lack of) affected their learning ability. The results also supported the need for UDL course designs in online classroom environments, as UDL provided flexibility and varying learning methods to support their learning processes (Frost & Connolly, 2018).

The consensus of the research supported that training and education for faculty on UDL framework for higher education did help to increase the learning potential for disabled learners (Gritful-Freixent et al., 2017). However, these studies, while identifying how the course can be redesigned for disabled learners, did not address the specific learning needs of TBI veteran learners. This study was relevant, as it showed the importance of making time to solicit and understand how TBI veteran learners are experiencing the effects of their disabilities, articulated from the TBI veterans' themselves rather than a generalized disability-based assumption, as they engage in their online learning environments.

Pedagogical Knowledge

Understanding how faculty are trained to support TBI veteran learners is a critical aspect of the design of this study. The study by Canto et al. (2014) included 73 practicing school psychologists with membership in the Florida Association of School

Psychologists who completed open-ended online surveys to record their experiences with students who suffered from TBI. Although 100% of those surveyed indicated that they had received some form of training for working with TBI sufferers, only eight respondents stated that they were comfortable working with these students.

The Center for Disease Control (CDC) (2018), in a report to Congress on the management of TBI in children, indicated that children who suffered from TBI needed continued cognitive support while they were in school. However, even at the grade school level, students with TBI were not properly identified. Often, they were classified under categories such as, special learning disability, other health impairment, emotional disturbances, and others, rather than TBI, specifically (CDC, 2018).

This report suggested that educational assessments should be dynamic, on-going procedures with built-in monitoring processes that modify the curriculum as the student's needs change. Similarly, these same tenets need to be applied to the adult TBI learner and specifically TBI veteran learners, as well. Inaccurately placing the TBI veteran learner under one of the other classified disability labels would not provide the TBI veteran learner with the emotional and cognitive rehabilitation they required (CDC, 2018). As discussed previously, the symptoms and impact of TBI can vary for days, weeks, and even years after the injury, and this proactive and repetitive feedback loop maintains academic continuity.

Lastly, this report noted that teachers typically have misconceptions and limited knowledge about TBI, and its residual effects (CDC, 2018). Some states have created in-service training for educators, which provided methods for supporting TBI veteran

learners in the classroom. Of late, several graduate programs have included courses on the topic of TBI, and some undergraduate online in-service courses have been developed to provide educators with TBI knowledge however, the courses are not being used by the majority of educators (CDC, 2018).

The mechanisms and residuals of TBI injuries, and how they alter learning, are not always fully understood by educators, as most are not formally trained on the topic unless they specialized in that field (Canto et al., 2014). This issue is not limited to higher learning institutions since TBI injuries can also be found in children and teenagers. TBI is more well-known than it was twenty years ago, as a result of professional sports related injuries, and repetitive concussive injuries and their residuals are now recognized as potential learning obstacles (Canto et al., 2014; CDC, 2018).

It is important to understand how the faculty are trained to implement their online courses as it relates to the learning experiences of TBI veteran learners (Canto et al., 2014; CDC, 2018). Few studies ihave dentified how the TBI veteran learner in an online course responded to the course material, the online learning platform, and their engagements with faculty and other students. This study will fill this gap by defining the experiences of TBI veteran learners in online courses.

Summary and Conclusions

TBI is a multifaceted disability, and those suffering from TBI may struggle with self-efficacy (Bandura, 1986) and require additional guidance and motivation (Zimmerman, 1995b). School attendance can be viewed as a transition phase for the TBI veteran learner, and research indicated that transitions could pose a challenge for

someone with TBI. A major aspect of Schlossberg's (1981) theory was that it was not the transition, itself, that amassed the person's internal conflict but how the transition merged with a person's individual state and situation at the time. In effect, it was the person's perceptions of themselves and the world around them, along with the new behaviors required to make the transition fit, that cause stress.

Vygotsky's (1981) theorized that internalization transforms the processes of voluntary attention, memory, the creation of ideas, and the development of volition, and that these processes were also be linked to learning. For the TBI veteran, their internal views and how they perceived their own disabilities and limitations influenced their ability to learn. This idea was further expanded to the interactions that occurred between one another, and that mental functioning did not occur, first and foremost, within the individual. Rather, the mental processes occurred *between* people on an intermental plane. This notion was relevant to the online learner who suffered from TBI, in combination with comorbid mental health disabilities, and may experience social isolation (Wertsch & Tykviste, 1992).

A thorough review of available research indicated multiple studies on TBI, learning with TBI, teacher's perspectives of teaching veteran and nonveteran TBI learners, and some of the differences experienced between campus learning and online learning. However, my search did not reveal insight into the experiences of military veterans with TBI, who were attempting to fulfill their educational goals using online universities and colleges and specifically, my search did not reveal the rich, detailed, lived experiences from the TBI veteran's perspective. Addressing this gap in research

will add to the scientific community, and to the study of this disability as it applies to higher learning and learning in online classrooms.

In Chapter 3, I will discuss the processes, methods, and procedures for conducting my study. The chapter included a discussion of the methodology, research design, rationale, my role as the researcher, participation selection, data analysis, and issues of trustworthiness.

Chapter 3: Research Method

Introduction

The purpose of this study was to understand the lived experiences of veterans with TBI that have participated in online university and college courses. The participants explained how they interacted with the technology in the online classroom, teachers, and fellow students, and identified aspects that were difficult for them as a result of their disabilities. With a more thorough understanding of the TBI veteran learners' experience in the online classroom and their interactions with various platforms and applications, modifications and changes can be addressed to better assist the learning potential of these students. This chapter will review the design and methodology of this study as well as the methods for recruitment, sampling, data collections, and analysis.

Research Design and Rationale

My primary research question was *What are the lived experiences of TBI veteran learners in online university and college courses?* My secondary questions included *How do TBI veteran learners perceive their educational experiences in an online course?* and *How do TBI veteran learners perceive the utilization of interactive technologies in their online courses?* I sought to understand the lived educational experiences of student veterans who had completed online courses leading towards completion of a degree after acquiring a TBI from their time in service, to include deployments to combat zones. To gain an understanding of the aforementioned phenomenon I used a phenomenological approach.

A case study was considered, and it was determined that this methodology was

not as relevant based, in part, to the types of research questions posed in this study. Yin (1994) indicated that a case study focused on the modern phenomenon within the real-life context, and the boundaries between the phenomenon and the context are not evident. The goal of my study was to understand the lived experiences of the participants, and collect their thoughts, feelings and emotions related to online learning with a TBI.

A grounded theory study was considered but I determined that it was not as relevant because this method values patterns in the data over individual experiences and stories (Charmaz, 2017). Grounded theory is an iterative process, and its process includes gathering and analyzing data in continuous rotation. Grounded theorists analyze the data, as it is being collected, which drives subsequent data collection to ascertain what is happening or occurring (Charmaz, 2017).

Yin (2009) indicated that qualitative research methods allowed one to study a real-world setting and ascertain how individuals coped and thrived in that setting. Past research has examined military veterans in online programs, but, after an extensive literature search, I found no current phenomenological studies that attempted to capture a TBI veteran's lived experiences of navigating and engaging their online learning environments.

The phenomenological study design developed a new understanding of the lived experiences and perspectives of TBI veteran learners who have attended online university and college courses towards the completion of a degree program. This method of research was chosen, above others, to obtain a rich description of the phenomenon in question. Specifically, the descriptive and detailed experiences of online learning while also

undergoing the variances of symptoms from TBI, to include the physical, emotional, behavioral, and cognitive changes and the effects that these issues have on the learning processes.

For Giorgi (1985) and Giorgi and Giorgi (2003), the fundamental word in phenomenological research is the word 'describe'. The aim, therefore, was to obtain accurate and rich descriptions of the learning experiences from the perspectives of the TBI veteran learners as they navigated their online courses, and interacted with the educational platform, technology, teachers, and classmates. Completion of this study identified themes and patterns related to aspects that increased or positively influenced the TBI veteran's learning processes and abilities or hindered and negatively influenced their learning processes and abilities.

Role of the Researcher

To define my role as a researcher, and understand the ethics and bias related to my study, I must acknowledge that I am a 30-year veteran of the U.S. Navy with diagnosed mild TBI. I discovered challenges during periods of my online learning, and I had to relearn how to learn. There were differences with my memory and my abilities to synthesize information. Motivation and mood were and are impacted by this disability. I have personally explored the university's disability program during periods that I struggled with the academic regimen. Other than time extensions for completion of this program, I did not pursue it further, and this was primarily due to stubbornness and pride.

I am acutely aware of my challenges while taking online courses, and I imagined others would have similar experiences. I wanted to better understand this phenomenon,

and its impact on other TBI veteran learners. I was also aware that because I suffer from this disability and have engaged in online learning, I have an inherent bias and must be mindful of this during every stage of the study.

Keen (1975) noted that the phenomenological research approach required a conscious attempt to reduce bias by setting aside preconceived notions, looking at each facet as if it were new, and keeping the participant's experience as the foundational data. By adapting the following procedures, personal bias was reduced, and processes for the study were more transparent. Included in these processes were the following:

- I did reflective journaling during the study. I wrote and reflected on each process of the study and commented on feelings experienced with the study and participants (Phelps, 2005).
- I reduced bias through the use of the qualitative checklist, which addressed the issues of reflexivity and credibility (Pannucci & Wilkins, 2010).
- I used memoing, the process of writing about the study as it progresses and adding ideas and thoughts about each stage of the study (Liu, 2016) to define my responses.
- I used member-checking as part of the follow-up interviews with participants. During the follow-up interview, they had the opportunity to review the transcribed initial interview for accuracy (Carcary, 2009).

Methodology

Participants were recruited from two closed group Facebook pages called "NSF Goat Locker" and "Basic Mentoring." NSF Goat Locker was comprised of current and

former U.S. Navy senior enlisted personnel who served in the Master-at-Arms rating (law enforcement). This rating was encompassed all forms of military law enforcement to include patrolmen, sentries, investigators, military working dog handlers, and members assigned to specialty units such as Expeditionary Warfare and Marine Corps Security Forces. Basic Mentoring was comprised of U.S. Navy personnel of various ratings, ranks and specialties.

Participant Selection Logic

Criterion-based selection purposive sampling was used to identify the participants for the study. The following criteria were used to define and select the participants:

- Must have served in the military
- Must have a diagnosis of TBI
- Must have received the injury while in service
- Must have completed at least one (1) online academic course while suffering from TBI
- Must have completed the online course within the past 24-months

The following exclusions will prevent selection for the study:

- No prior active or reserve military service
- Does not have a diagnosis of TBI
- Has not participated in an online academic course leading to a degree

The consensus amongst researchers was that data saturation was reached when no new information was obtained, when there was enough information obtained to replicate the study, and when additional coding of the data was no longer feasible. Reaching

saturation was not determined by the amount of data collected, but by the depth and richness of the collected data (Fusch & Ness, 2015).

Instrumentation

I collected three forms of data: (a) an initial interview, (b) a follow-up interview (verification of transcribed initial interview), and (c) responses to journal topics. An interview guide was developed based on the reported personal experiences of TBI injuries and cognitive challenges discovered during my research. The interview guide is in Appendix A. The initial interview lasted between 40 and 60 minutes and was conducted via telephone. The follow-up interview, if conducted, would have allowed the participants to review their transcribed interviews and add to or edit their comments (Appendix B). All participants provided informed consent before the interview. I recorded the interviews and transcribed each one myself.

Knowledge was gained as each participant described their thoughts, feelings, and lived experiences surrounding their transitions from the military (if applicable) and the adjustments they experienced as a result of their post TBI learning challenges in online classrooms. The participants also provided vivid examples of their struggles adjusting to the learning differences pre-and post TBI. Prompting questions were included and were used, when necessary. The questions were designed to elicit descriptive narrations from the participants and were aligned to address each of the research questions.

The purpose behind each question was to gain insight into the lived experiences of TBI veteran learners in online university and college courses, understand how TBI veteran learners perceive their educational experiences in an online course, and how TBI

veteran learners perceive the use of interactive technologies in their online courses. Table 1 is a correlation and visual representation to show the designed alignment between the research questions and interview questions. In practice, the interview questions elicited responses from participants that assisted in developing a rich and detailed description of the phenomenon being examined.

Table 1

Correlation of Research Questions and Initial Interview Questions

Primary Research Question: What are the lived experiences of TBI veteran learners in online university and college courses?
Associated Initial Interview Questions
Can you describe your TBI symptoms?
Can you describe how the symptoms affected your academic abilities?
Prompting Questions:
Can you describe your ability to concentrate on learning new material?
Can you describe your motivation with attending class and completing assignments?
Can you describe your mood when learning new material?
Can you describe your ability to use time management during your online course?
Secondary Research Question: How do TBI veteran learners perceive the utilization of interactive technologies in their online courses?
Associated Initial Interview Questions
Can you describe your experiences with online course instructions?
Prompting Questions:
What were your experiences with various learning methods, such as audio, video, text, and programs and applications used by the college or university?
Can you describe how each learning method assisted or hindered you?
Can you describe your online interactions with other students?
Prompting Questions:
Can you describe your feeling about your contributions to discussion posts?
Can you describe your feelings and thoughts about your contributions to group assignments?
Secondary Research Question: How do TBI veteran learners perceive their educational experiences in an online course?
Associated Initial Interview Questions
Can you describe your feelings and thoughts about your interactions with your online instructor(s)?
Prompting Questions:
Can you describe any instances when they may have assisted you in your learning endeavors
Can you describe any instances when they may *not* have assisted you in your learning endeavors?
Can you describe whether they knew about your TBI injury and if so, their engagements with you afterward?
Can you describe your experiences with the various forms of assistance offered by the university and college disability office?
Prompting Questions:
Can you describe your experiences with seeking assistance?
Can you describe the type of assistance you received?
Can you describe your thoughts and feelings about the quality of assistance?
Can you describe how the assistance benefited you?
If it did not help, can you describe why?
Can you describe your thoughts and feelings after reaching this conclusion?
If you did not seek assistance, can you describe why?

Follow-Up Interview Protocol

After all initial interviews were transcribed, the transcriptions were sent to each participant and follow-up interviews were offered. The participants had the opportunity to edit their transcribed interview(s) and add to it if they remembered other information they wished to share. The follow-up interviews would have been scheduled at the convenience of the participants and recorded and transcribed in the same manner as the initial interviews. Although the protocols were in place for the follow-up interview, the participants were satisfied with their transcription and no follow-up interviews were conducted. Further details on this process will be discussed in Chapter 4.

Journal Entries

I requested that each participant respond to five journal topics and email these to me once they answered them. The purpose of this journal was to allow the participants to further reflect on the questions that were asked during the initial interview and expound upon them (Appendix C). The questions in Table 2 specifically addressed the conceptual framework identified for this study. As discussed previously, the conceptual ideas focused on understanding the learning processes of TBI veteran learners based on Bandura's theory of social learning and self-efficacy (Bandura, 1986).

Secondly, the journal topics focused on defining and understanding the nexus between the cognitive issues of TBI veteran learners in online courses including issues related to memory, attention, and the process of self-regulation (Zimmerman, 1995a). Thirdly, they focused on understanding issues relevant to online pedagogy of teaching TBI veteran learners based on Schlossberg's transition theory (Schlossberg, 1981; Griffin

& Gilbert, 2015) and finally, understanding Vygotsky's theories about altered development, as it relates to mental disorders (Vygotsky, 1993). Vygotsky's theories were included because of the symbiotic relationships between TBI and some mental health disorders, and how they may affect the learning processes and the learning experience for the TBI veterans.

Table 2
Correlation of Conceptual Framework and Journal Entry Questions

Bandura's concept of self-efficacy (1986)
Associated Journal Entry Questions
After your TBI, could you describe how you felt about your ability to succeed in your online University and college course?
Can you describe any instances, assignments, or learning challenges that altered your internal beliefs about succeeding?
Zimmerman's concepts on TBI and learning (1995b)
Associated Journal Entry Question
Can you describe any challenges with your self-regulated learning after your TBI?
Schlossberg's transition theory (1981)
Associated Journal Entry Questions
Can you describe any changes in your adaptability after your TBI?
Can you describe the comparison in your learning abilities pre and post TBI?

Procedures for Recruitment, Participation, and Data Collection

Purposive sampling, as defined by Patton (1999), was the logical choice for qualitative studies, and allowed the researcher to specifically target and identify participants based upon a chosen criterion. According to Seidman (2006), this method of sampling was fitting when each of the participants had experienced a similar phenomenon. Sufficiency would be achieved when the proper number of participants met the inclusion criteria to participate in the study.

To determine the selection of the sample size for this study, several factors were considered to include the research question (s), available research on acceptable

procedures for the collection of data, and data analysis. There are varying philosophies on the appropriate sample size for a phenomenological study, but according to Patton (2015), three to ten subjects are suitable, as data saturation will most likely occur within this range. The following criterion was used to define and select the participants:

- Must have served in the military
- Must have a self-reported diagnosis of TBI
- Must have received the injury while in service
- Must have completed at least one (1) online academic course after diagnosis with TBI.
- Must have completed the online course within the past 24-months

For this study, the sample size consisted of six to ten participants. I recruited from two closed Facebook pages titled NSF Goat Locker and Basic Mentoring. These closed pages have a member verification process for joining and being accepted as a member of the group. The members from NSF Goat Locker consisted of U.S. Navy Chief Petty Officers (E7), Senior Chief Petty Officers (E8), and Master Chief Petty Officers (E9) who were in the Master-at-Arms (MA) rating; this rating encompassed the duties of law enforcement, Force Protection, and Antiterrorism, and investigations. The group had approximately 1,300 members and included both active duty and retired service members. Gender, race, time in service, and ages varied.

The group from Basic Mentoring consisted of U.S. Navy personnel, both officer and enlisted, and of various ratings and specialties. The group had approximately 32,000 members. Genders, race, time in service, and ages varied. Should sufficient participant

numbers not be obtained, processes were in place for submission of an updated application to the IRB and included the addition of my personal Facebook page to be used for recruitment, Walden's Online Research Participation Pool, and the use of snowball sampling to meet the required recruitment numbers for completion of the study.

Semi-structured interviews and journaling were used to obtain the perspectives of TBI veteran learners concerning their individual experiences about the academic processes. According to Moustakas (1994) questions were embedded in phenomenological studies to fully explore and understand the issue(s). The interview process, and the intentional design of open-ended interview questions, allowed the participants to narrate their experiences in a continuous and natural way, without restrictions.

For this study, two separate interviews with the participants were designed. Data sources for this study included the initial interviews with TBI veteran learners, journal questions completed by TBI veteran learners, and follow-up interviews with TBI veteran learners to support member checking. The purpose of the follow-up interviews, as a method of member checking, enabled the participants to review their transcripts from the initial interviews, and verify the answers they provided.

The initial interview was conducted via the telephone and recorded, using a handheld Sony recorder, for later transcription. The initial interviews lasted approximately 40-60 minutes and were scheduled at the participants' convenience. Each participant was informed of their right to withdraw from the study, and that their confidentiality would be maintained. Additionally, and due to the protected nature of

these participants, they were provided resources for counseling if discussing the residuals of their injuries caused any duress.

I transcribed the interviews, personally, to preserve the quality of the data. I sent the transcribed interviews to each participant, along with the Journal questions. McGrath, Palmgren, and Liljedahl (2018) noted that member checking assists with ensuring trustworthiness, and for this reason, a follow-up interview was offered. Participants were provided five journal questions to reflect upon between completion of the initial interview, and the follow-up interview.

Upon completion of the interviews, each participant was debriefed, using the interview guide. Personal information was removed during transcription, and files were labeled "P1, P2," etc. Data was kept on a password-protected laptop, which only I have access to. Additionally, security protocols were activated on the laptop to prevent unauthorized access.

The journal questions were linked to the conceptual framework of this study and allowed participants the opportunity to expound on their thoughts, feelings, and experiences of online learning with a TBI. After transcriptions of the interviews were completed, I emailed each participant their respective transcribed interview for review. I requested that they carefully review the transcribed interview and offered each participant the opportunity for a follow up interview. Confirmation was received from five of the participants, indicating that their transcripts were satisfactory, and no follow up interview was necessary. P3 was not able to be reached for follow up.

Data Analysis Plan

I used the phenomenological model of analysis developed by Giorgi (1985) and Keen (1975). The first step in this phenomenological method was the process of removing all preconceived notions and ideas about the participants' experiences. This process was referred to as epoche. As I listened to the audiotapes, I developed potential codes. According to Saldana (2013), data to be coded can vastly range from a single word, to a full paragraph, and to a full page of text. Since coding was a subjective and interpretative event, and could vary based on the researcher's epistemological orientation, theoretical and conceptual frameworks, and academic background, I memo'd during this process. By expressing my personal thoughts while I created codes on the transcribed interviews, I was better apt to challenge my own assumptions and strengthen my critical thinking.

Raw coding began during sequential transcription of the interviews and was annotated in my memos. This assisted with providing ideas for analytic consideration while the study was in progress and during each transcription phase. Upon completion of all interviews and transcriptions, the data was uploaded into a data analysis program.

I used the Dedoose computer application program, which provided qualitative data management, excerpting/coding and analysis, to assist with analyzing my collected data. I uploaded the transcribed audio interviews to my log-in protected home computer. In Dedoose, which has a log-in protected website, I highlighted units of meaning within the sentences and paragraphs of the transcribed interviews. It is recommended, when

coding multiple participant's data, to code each participant sequentially, as subsequent data sources may alter any previous coding selections (Saldana, 2013).

After the transcripts were coded, the codes were sorted and grouped into similar categories. In vivo coding was used, since code names originated from the interpretation of the data and/or quotes from participants, as opposed to using a priori coding whereby codes are developed prior to examining the data. Grouping the codes and organizing them into categories assisted with the development of patterns for the participants, individually, and as a group. The patterns were interpreted and compared for similarities and differences, and further reduced into themes.

My analysis incorporated the review of the conceptual framework of this study and included the development of themes of self-efficacy, and personal, social, and organizational issues. I analyzed the participant's journals and my memos, and synthesized any codes, patterns, and themes, and incorporated them, where applicable. This manner of triangulation enhanced reliability and credibility.

Issues of Trustworthiness

Credibility

Credibility, in qualitative research, depended upon three elements, which included the use of rigorous techniques for gathering and analyzing data, verification that the researcher was experienced and trained, and lastly that there was value in the qualitative inquiry (Patton, 1999). For this study, I used reflective journaling and memo'd during the coding process. During the process of the study, I wrote and reflected on each stage of development as the study progressed, and commented on the feelings, thoughts, and ideas

I experienced about the study and participants. I had multiple sources of data including the initial interviews, follow up interviews (as requested), and the participants' journals. Member checking occurred, as a means to verify and validate the data, when each of the participants reviewed their transcripts for accuracy (McGrath et al, 2018).

Transferability

Transferability in qualitative research related to the researcher's ability to provide a rich and thick description of the study, the participants, and the process which enabled the reader to transfer the findings to their own setting (Korstjens & Moser, 2018). For this study, I engaged in memoing throughout the study and used Keen's model of data analysis for structuring my analysis. According to White, Woodfield and Ritchie (2003), the process of structured data analysis allowed the researcher to explore data in depth while also keeping an audit trail. I used open-ended and thought-provoking questions in an attempt to gain the deep and insightful feelings and thoughts of the participants. I attempted to gain diversity in my sampling by not placing limitations on gender, age, geographical location, or race.

Dependability

Dependability in qualitative studies is the transparency involved when explaining and describing the research study, from start to completion, and maintaining the records, logs, journals, and all other forms of research documentation (Korstjens & Moser, 2018). I had multiple sources of data including the interviews, participant journal, and my notes and memos. I created an audit trail that included email correspondence for the participants transcribed interviews, their confirmations that their transcriptions were

accurate, and that they did not desire follow-up interviews for the addition of new information or changes to their transcriptions.

Confirmability

Confirmability in qualitative research is closely aligned with dependability and record keeping. Interpretation of data was not based on the researcher's viewpoints but, rather, solidified in the collected data. The researcher is required to maintain objectivity and reduce the propensity for bias through neutrality (Korstjens & Moser, 2018). I engaged in the process of reflexive journaling to note any biases that occurred throughout the study.

Ethical Procedures

All procedures for this study were outlined and submitted to the Walden IRB. Included in the application to the IRB were the adult informed consent form, recruitment flyer, letters of cooperation (2) from the Facebook administrators for each of the Facebook pages to be used for recruitment, initial interview questions, journal questions, follow-up interview questions, and the Human Research Protections training completion certificate. Permission from IRB was obtained (IRB approval number 10-02-19-0237737, expiration October 1, 2020), and the following procedures were adhered to ensure ethical standards were maintained throughout the study.

I obtained informed consent from each participant prior to commencement of the study. Each participant received an informed consent form, via email, with instructions to read the form and if they agreed and wished to participate, they needed only to respond to the email with the words, "I consent" in the subject line. Participants were told that they

had the option to refuse to participate in the study and could withdraw at any time. I coordinated an interview schedule with each participant who agreed to participate. I explained the interview process, to include their ability to stop the interview should it become upsetting for them. Additionally, I advised them of the contact number of the veterans affairs crisis hotline, which was located on the informed consent form.

I did not use any form of incentive, such as gift cards, as a means to encourage participation in this study. Participation was entirely voluntary, without any promises or enticements. I did not conduct this study within my own work environment, nor were there any conflicts of interest or power differentials.

I created a master list with each participant's name, and de-identified each participant by assigning a pseudonym to each person (i.e., P1, P2, etc.). For the interviews, transcriptions, and any notes taken for descriptions of these processes in the completion of the study, only the pseudonyms were used. The master list was stored in a separate file, and was password protected.

A dedicated personal laptop was used for this study, and was password protected for access. I was the only person with access to this laptop, and I was the sole administrator for the device. Upon completion of the study, all data will be transferred to a USB drive which I will store in a locked firebox for five years. Additionally, I will correspond with Dedoose and request that they delete the data that was uploaded into their secure program, upon completion of the study. After five years, I will destroy the USB drive.

This chapter discussed the processes and procedures to be used while conducting my study. Descriptions of potential researcher biases were identified, in addition to scientifically supported processes that can reduce bias and increase the various issues of trustworthiness. The results obtained from the interviews will be analyzed and interpreted in Chapter 4.

Chapter 4: Results

Introduction

The purpose of this study was to understand the lived educational experiences of TBI veteran learners who had completed online courses leading towards the completion of a degree following a TBI injury acquired from service. To gain an understanding of this phenomenon, a phenomenological approach was used. My primary research question was What are the lived experiences of TBI veteran learners in online university and college courses? My secondary questions included How do TBI veteran learners perceive their educational experiences in an online course? and How do TBI veteran learners perceive the utilization of interactive technologies in their online courses? Chapter 4 includes the summary of the participants, data collection information, data analysis, data structuring, evidence trustworthiness, and lastly, the themes developed from the analyzed data.

Setting

There were no specific personal or organizational conditions that influenced participants, or their experiences, at the time of this study, or that may have influenced the interpretation of the study results. Each of the participants expressed an active family, work, and school schedule. This varied by participant, as some were still on active duty, while others were retired or were out of the service and were working in the civilian sector as they pursued their academic goals. I conducted my qualitative interviews via phone, during times that were convenient for the participants. The internal and external motivators that participants reported assisted and supported their online learning, to

include their respective schedules, family, work (civilian or military), and the help obtained from their professors, will be further discussed and analyzed in Chapters 4 and 5.

Participants voluntarily spoke with me during the interviews and did not express any overt concerns about confidentiality. All participants responded to the informed consent document and were informed of the risks and benefits of participating in this study. My prior experiences as a Senior Enlisted Leader prepared me for my interactions with the participants and enabled me to maintain focus and be sensitive to any changes in the tone and tempo of voice as we discussed the questions.

Demographics

The demographics I included for this study were the participants' gender, race, age, branch of service, and number of years served. The participants' physical location, while mentioned during the majority of the interviews, was not addressed in any of the interview questions. People who join the military, by and large, travel and reside in areas all over the world, and since the lens of this study was directed towards online learning, I was not focused on, or restricted by, a specific geographical location. All interviews were conducted by phone, at the participant's requested time and date. Table 3 is a visual representation of the participant's demographic data.

Table 3

Participant Demographics

Participant	Age	Gender	Race	Branch of Service	Years Served
P1	35	Male	Caucasian	U.S. Navy	18
P2	47	Female	Other	U.S. Army	14
P3	41	Male	Caucasian	U.S. Navy	23
P4	46	Male	Caucasian	U.S. Navy	25
P5	38	Male	Caucasian	U.S. Navy	13
P6	56	Male	Caucasian	U.S. Navy	29

Participant 1 (P1)

P1 was a 35-year-old Caucasian male who served in the U.S. Navy for 18 years and received his TBI in service from explosive-type events. His TBI symptoms included extreme light sensitivity and migraines, which could last days at a time, hindered any type of productive activities. He experienced difficulty with both short- and long-term memory and had difficulty with focusing on material and tasks.

Participant 2 (P2)

P2 was a 47-year-old Other female who served in the U.S. Army for 14 years and received her TBI in service from explosive-type events. Her TBI symptoms vary, depending upon daily stressors, but were consistently present to some degree. Typically, she described losing words, severe forgetfulness, and lack of comprehension when reading text. If she was severely fatigued or stressed, she experienced stuttering, mini strokes, and vision issues where her eyes "bounced." The severity of her symptoms was

dependent upon her over-all state of being.

Participant 3 (P3)

P3 was a 41-year-old Caucasian male who served in the U.S. Navy for 23 years and received his TBI in service from multiple and repetitive concussive/explosive-type events. His TBI symptoms included severe concentration, focus, drive, and motivation issues. He noted a decline in his cognitive abilities, including memory and recall. He had headaches and vestibule issues.

Participant 4 (P4)

P4 was a 46-year-old Caucasian male who served in the U.S. Navy for 25 years and received his TBI in service from multiple and repetitive concussive/explosive-type events. His TBI symptoms included the transitioning of memories from short term to long term. This included faces, names, texts, and reading materials. He suffered from tinnitus, headaches, and vertigo with heights. He received treatment from a neurologist, which had helped.

Participant 5 (P5)

P5 was a 38-year-old Caucasian male who served in the U.S. Navy for 13 years and received his TBI in service from multiple and repetitive concussive/explosive-type events. His TBI symptoms included fatigue, difficulty retaining information, and difficulty focusing. He experienced headaches and received treatments for them. He had light sensitivity as a result of his TBI and wore sunglasses on a near consistent basis to minimize his symptoms.

Participant 6 (P6)

P6 was a 56-year-old Caucasian male who served in the U.S. Navy for 29 years and received his TBI in service from multiple and repetitive concussive-type events. His TBI symptoms included memory loss, over time. He also suffers from mental health issues, related to service and TBI.

Data Collection

The inclusion criteria for this study was explained on the posted flyers, and consisted of the following:

- Must have served in the military
- Must have a self-reported diagnosis of TBI
- Must have received the injury while in service
- Must have completed at least one (1) online academic course after diagnosis with TBI.
- Must have completed the online course within the past 24-months

Recruitment for the study was initiated after approval was received from Walden University IRB. Recruitment flyers were posted in the NSF Goat Locker and Basic Mentoring Facebook pages. After 3 months of repeated reposting of the flyers to these pages, only one participant volunteered, despite having over 33,000 members combined between the two pages. This prompted consideration for one of my first possible themes, that perhaps this injury may be one that military members, former or current, may not be willing to acknowledge, discuss, or report; as it related to this study, the theme may be relevant to how participants engage with disability offices in their respective schools for

ADA assistance. I revised my recruitment proposal to include:

- Posting a flyer on my personal Facebook page
- Using the Walden Participation Pool
- Adding the snowball sampling method to each of the recruitment flyers

After receiving IRB approval for these alterations, the changes were implemented; the IRB approval number did not change. The IRB revision added snowball sampling and my personal Facebook page. The thought process for using my personal Facebook page, in addition to the inclusion of the snowball sampling method, was that by allowing the group members and friends on these Facebook pages to share the information, I would broaden and deepen the sampling pool.

There was a risk with using the snowball sampling method with regard to diversity within the sampling group, since the flyer was being shared within individual networking circles. However, with the noted and apparent reluctance to come forward to discuss this topic, I felt the risk was negligible. The recruitment flyer was also posted to the Walden Participation Pool but no participants were gained from this source. These changes were successful and five additional participants volunteered. I had previously designed the study with the goal of interviewing eight to ten participants; these numbers were never came to fruition and the study proceeded with the six participants I was able to recruit.

Once participants contacted me, I screened them for eligibility using the established eligibility criteria. After the criteria was verified, the informed consent form was sent via email. In the informed consent email, the participant was directed to read the

consent form carefully, and if in agreement, reply to the email, placing the words "I CONSENT" in the subject line. Additionally, it was requested that they pick a time and date that was convenient for them for our Initial Interview.

All six participants consisted of current or former military members who acquired a TBI injury while in the performance of their military duties and had completed at least one online academic course after their TBI diagnosis. I obtained the data for this study between October 7, 2019 and January 8, 2020 and interviewed six participants via telephone. As stated above, all participants provided informed consent, which included information about the protocols indicated by the Walden University IRB.

Recruitment of participants proved to be challenging. My intent for this study was to interview eight to ten participants, and I was unable to reach that goal even after adjustments to my recruitment processes. It may be due to the stigma associated with the disability, and that these veterans are not associating the TBI as a disability. This may be a deeper, more complex aspect of this study, and one that is unique to military service members. I will discuss this further in Chapter 5.

The data I collected included six interviews and three journals. After transcribing the audio interviews, I emailed each transcription to the participant. Five of the six participants responded to my emails requesting content verification of their respective transcripts. As a means of member-checking, each participant acknowledged that they were satisfied with the content and did not have any additional information to add. I recorded the interviews using a hand-held Sony recorder, and each participant was made aware of the recording and gave their consent. The interviews lasted between 25 and 40

minutes. During the interviews, I wrote field notes, including any questions or concerns that I had, and potential codes or themes I saw developing as the interviews progressed. Upon the conclusion of each interview, I downloaded the audio file into my personal and secure laptop and saved the file under the corresponding participant's assigned alpha-numeric code (i.e., P1, P2, etc.).

I transcribed all interviews myself and did not use any outside transcription service. While time-consuming, this did provide additional opportunities to review and analyze the data, as I had to repeatedly listen to each interview while transcribing them. I transcribed the interviews and saved the transcribed Word files under each participant's filename (P1, P2, P3, etc.) on my secure laptop. I reviewed each transcript for accuracy against the audio file. After the transcript was reviewed, I emailed the transcript to the participant, along with the journal questions.

I requested that each participant review the transcript for accuracy, that they complete the journal questions and that we arrange our follow-up interview to discuss the transcript. P1, P2, P4, P5, and P6 responded, via email or text, stating that the transcript was sufficient, and no further follow-up interview was needed. Several attempts were made to reach P3 by email and text, to verify the transcript and set up a follow-up interview, if necessary. However, these attempts went unanswered.

Data Analysis

The procedures used for this phenomenological study began with the collection of data from current and former military members with TBI, and who had online learning experiences with their TBI injuries. I used the empirical phenomenological model of

analysis developed by Giorgi (1985) and Keen (1975). The first step in this phenomenological method was the process of removing all preconceived notions and ideas about the participants' experiences. This process is referred to as epoche.

According to Saldana (2013), data to be coded can range from a single word, to a full paragraph, and to a full page of text. I focused on sentences and paragraphs, rather than single words, during my coding process, to capture the depth of the participant's account and the phenomenon, itself. To ensure accuracy, I listened to the audio files for each participant over four times each; transcribing the interviews myself assisted with this, as I had to replay the files repeatedly during the transcription process. I also reviewed the files, again, after the transcription was complete, to verify each was accurate.

As I reviewed the audiotapes during the transcriptions, I memoed and identified code titles for use in Dedoose, a qualitative analysis program. Coding is a subjective and interpretative event and can vary based on the researcher's epistemological orientation, theoretical and conceptual frameworks, and academic background (Saldana, 2013). Because of this, I took notes during the interviews, transcriptions, and audio file reviews.

I began developing initial codes or what is often referred to as raw coding, during the sequential completion of each interview, the transcription of the interviews, and the review of the journal's questions. I used a systematic process of capturing these ideas, themes, and codes for analytic consideration, as they occurred, and during each stage of the process of the active study. Upon completion of all interviews and transcriptions, the data was uploaded into the data analysis program Dedoose.

The Dedoose computer application program provided me with qualitative data management tools that allowed me to easily identify the text to be coded, link the codes to the text, and analyze my collected data. After uploading the interviews and journals, I used my notes to create the codes, using topics that I identified during the interviews, transcription, and my multiple reviews.

I highlighted units of meaning within the sentences and paragraphs of the uploaded and transcribed interviews and journals. I then assigned a code to the text or quote that I highlighted in Dedoose. I continued this process throughout each of the participants' transcripts. During this process, I received the journals from P1, P2, and P6, which I uploaded into Dedoose, and I coded each journal using the same process as the transcribed interviews. I considered this to be my initial coding sequence. I sequentially coded P1 through P6 interviews, and then sequentially coded the journals, using the initial codes that I established, as recommended by Saldana (2013).

I did not develop any new root codes after completion of my initial coding sequence, but I did add subcodes, specifically addressing the duration of time conducive for learning (30 minutes and 1 hour), and specifically why ADA assistance was not sought, as a result of all the interviews after P2 and P4, respectively. I repeated this process a total of three times to ensure that no new codes were required. As a result, I was able to reach data saturation by P4, with no new codes discovered.

After the transcripts and journals were coded, the codes were sorted and grouped into similar categories. In vivo vice a priori coding was used, since code names originated from the interpretation of the text or quotes from participants (Saldana, 2013). Grouping

the codes and organizing them into categories assisted with the development of patterns for the participants, individually, and as a group. The patterns were interpreted and compared for similarities and differences.

Summary of Participants' Interviews

Below are summaries of the participants' responses to the interview and the journal questions. Each participant's learning issues, classroom learning preferences, and interactions in and out of the classroom will be discussed. Lastly, I will discuss how the TBI injury affected learning, and steps taken to mitigate learning challenges.

P1

Neurological and physical challenges from P1's TBI required him to learn mitigating techniques to continue to perform at work, home, and at school. He discovered that learning online was his best option because he was able to work at his own pace and schedule his work around his symptoms. His ability to focus was the most productive during 30-minute increments and trying to push past that window often resulted in frustration; taking a break from the material was a mitigating tool for him.

His preference for learning methods (audio, video, text, combination) varied, depending on his symptoms. He was not aware of any technologies offered by the school to assist with these disabilities; he did have hearing loss because of his TBI, and his hearing aids connected to his phone to assist with communications. He used his phone for notes and scheduling, as this assisted with keeping track of his assignments and lessons.

He described his interactions with other students as being minimal and expressed displeasure with group assignments because he was not comfortable relying on another

student for his grade; he noted that in past group assignments, he ended up doing the other group member's work to ensure success on the project, and this caused extreme stress.

His interactions with his professors had been minimal. He had mentioned, in discussions, that he has a TBI, but has not received any specific assistance from any professors as a result. He was not aware that his school had any form of disability assistance. He expressed concern over the idea of any form of disability assistance, stating that he "did not want to raise any red flags" since he was still on active duty.

P1 was driven to work through his learning challenges and found methods that assisted with scheduling, memorizing, and learning new material. His symptoms often impacted his learning however, he discovered mitigating methods to work around these issues, mostly through increased breaks from learning sessions, and learning material in shorter time increments. He liked the benefits of online learning because of the flexibility that it offered to learn at his own pace.

P1 was still on active duty and was reluctant to self-admit his disability to his school administration for fear of drawing attention to himself. There was an implicit notion that somehow this news might make its way back to his military branch of service and jeopardize or compromise his military career. He also admitted that he was not aware that his school had any form of disability assistance programs for TBI learners, nor did he ever consider seeking such assistance.

P2

She had trouble with comprehension of material, which required her to re-read the

text multiple times and, despite this, the information was not retained in long-term memory. She expressed frustration with this, as it related to licensing examinations, which required her to memorize large amounts of information over a lengthy duration and then be tested on it. She noticed she could not focus for long periods and had to take numerous breaks; focusing too long on one task also caused severe headaches.

She has also learned mitigating tools to assist her with her learning. She noted that the time differences for the assignments were a point of contention and a challenge to master with her TBI. She made use of her calendar to outline her entire day, with reminders, to make sure she did not miss deadlines; and this included time zone differences.

She remarked that, in addition to the TBI, there were days that she simply could not function due to depression, which was connected to her TBI, and she has been fortunate to have helpful professors who she was able to reach out to when these instances occurred. She favored online learning because she felt she had easier access to her instructors for help, without the same stigma that would be associated with raising one's hand in a brick and mortar classroom. She noted that online learning was challenging because, overall, she learned better through hands-on practical applications, rather than video, text, or audio.

She discovered that she would lose track of the days of the week, as a result of her TBI, and this severe reduction in her time management skills was problematic for school assignments. She did self-admit her disability, first to her professors who then coordinated notifications to her school, and she did receive an accommodation letter

granting her additional time to complete assignments. She praised her professors and her school for the assistance they have offered her.

She felt disappointed by most of the discussion post engagements because it seemed like most of the students did not want to engage, but just wanted to respond with, "good post…" rather than dig deeper into the topic(s). This was bothersome because of the effort she had to put forth to learn the material and compose the discussions. She has not experienced any group assignments and did not have any insight on this form of learning. She felt that the ancillary technology offered by the schools was not that beneficial because most did not have any additional training to instruct her on the usage.

The college provided all her textbooks in PDF format, and she had a PDF audio reader that converted the text file into audio format for her. This allowed her to listen, rather than read, her required lessons. She described the importance of this when her eyes and headache symptoms were acting up. She expressed such gratitude for the assistance that the school and the professors had provided. She identified that the need for more time was central for the TBI learner and that schools should have dedicated professionals and programs to help TBI learners.

P2 described TBI symptoms that varied in range from moderate to severe and were always present. These symptoms, in addition to secondary and overlapping disabilities, greatly impacted her learning. Her TBI had also triggered depression, and she described instances when she simply was unable to function or engage in other than basic activities. She did self-admit her TBI to her school and her professors and has greatly benefited from the assistance provided. She lauded the extra care provided by her

professors who, at times, would do what could be viewed as welfare checks and motivational boosts, to help her when her symptoms were flaring up. She has learned to mitigate her learning challenges by using her calendar with reminders, learning material in brief intervals, and taking breaks between learning activities. She indicated that the most substantial effect of the TBI was that learning became much more time-consuming.

P3

P3 was attempting to try to complete a master's degree in the midst of his TBI symptoms. He noted that everything revolving around learning took a significant amount of time because he could not focus. He stated that he would have to re-read and re-watch videos numerous times to absorb the information and he had to ask his teachers for additional help. His acknowledged that his master's project should have taken one semester, and it took him one year to complete.

He observed that his notetaking declined in accuracy and clarity. He needed more time to understand new concepts, lessons, and complete tasks. His motivation was impacted, as well. He was fatigued, lethargic, and felt angry because of the symptoms he was experiencing, and their impact. He noted that his time management was horrible, which added to his fatigue. He was not able to concentrate during the day and discovered that the evening hours, when the house was quiet, afforded him the best environment to learn.

The online school he attended was well structured and was projected based, which he enjoyed and felt was beneficial to learning. The school used Adobe Connect for the projects, and he liked that once the groups were assigned, that he was just working and

engaging with those few people. He preferred visual learning rather than text or audio but noted that technical topics would need a combined method. He remarked that the school brought in technical experts from the field to provide additional support and conceptional ideas, which added to the lessons, and brought depth to the learning that the professors, alone, could not provide. He enjoyed that added technical knowledge.

He self-admitted his TBI to his professors, towards the end of his program, because he was struggling. He stated that his professors were amazing. They scheduled telephone meetings to assist him and gave him extensions to help him meet his goals. He did not seek ADA assistance from the college, nor did his professors mention any other forms of assistance from his college. He was not aware that TBI fell under ADA as a disability. He did not view his issue as a "disability" since he was not on campus or in a wheelchair.

P3's TBI symptoms caused difficulty with focus, cognition, concentration, memory, recall, mood, and fatigue. He described the need to re-read text and re-watch videos repeatedly to understand and retain the information. Additionally, he noted that because frustration would set in during the learning processes, frequent breaks were required to allow him to re-focus.

These actions, collectively, were time-consuming. He was reluctant to self-admit his TBI injury and only did so after realizing that he was not going to be able to complete his program without some form of assistance. At that point, he did self-admit to his professors, only. He explained that after doing so, his professors greatly assisted him by providing additional telephone conferences and deadline extensions. He did not however,

consider notifying the school of his disability, as he did not view his TBI as such. His rationale for this revolved around the comparative notion that he was in an online forum, rather than on a campus, and he associated disability offices and programs with brick and mortar schools and with physical disabilities, only.

P4

For P4, reading and processing information was difficult. Hearing information and taking notes was more effective for him. If he read new material in the process of completing his coursework, he had to take the test immediately, or he would lose the information and had difficulty recalling it. He described it as, “So much in, so much out.” He described an example of having to learn mathematical formulas for business in the past. Presently, he can look at the formulas and know whether they are correct or not, but cannot recall the formulas, themselves.

To concentrate, he must have no background noise. There can be no secondary sensory input. He gave an example of being in a restaurant, where there are many people talking all around. In an example such as that, he cannot focus and remember one conversation if other conversations are occurring around him. He experienced fatigue when learning, to include anticipatory fatigue, because he was aware that learning with his TBI was challenging and exhausting.

He was enrolled in a self-paced course where enrollment lasted for 6-months, and this schedule worked for his work and personal life. He described being better at long term time management than short term time management. His degree was more paper-based, rather than test-based, and he picked this degree plan based primarily due to the

challenge of his disabilities. The school used combined learning methods, which was beneficial to him. However, he noted that because he did travel quite a bit, his school software was not compatible with many of his portable devices, and this was often problematic.

He did not engage in any discussion post, group assignments or with any classmates; he only had one course where he was in class with other classmates for a group project, and that was a negative experience for him. He noted that the group was disproportionate in experience and skills, and a breakdown in communication between group members caused unnecessary friction.

He described that his school had a mentor program, whereby his student mentor reached out to him weekly. There was also a course mentor that monitored his academic progress. This was a solo model, where the student obtained the material, studied, wrote papers, or completed tests, and progressed to the next assignment. He maintained contact and updated his mentor with any delays to his progress. His mentor knew about his learning challenges, and about his TBI. He did not ask for any ADA assistance and was not aware that the college had any assistance for his disability.

P4's TBI symptoms caused difficulties with transitioning memories from short-term to long-term. He had difficulties with faces, names, text, and retaining the material he read. Hearing information and taking notes helped him to retain the information. His physical learning environment was also a factor and, to concentrate, he had to be in a quiet area without any background noise or distractions.

Because he experienced fatigue when learning, he felt the self-paced courses

afforded him the flexibility to work around and with his disability because his symptoms often prompted the need for additional time. He remarked that he deliberately opted for his paper-based degree plan because of his difficulty with retaining information for tests. He did self-admit his TBI to his school mentor, and his mentor was aware of his learning challenges. He did not notify his school of his TBI or ask for ADA assistance. He was not aware that there was any type of assistance for his disability.

P5

P5 described himself as easily distracted while learning new materials. He discovered that he learned best during short durations. He described needing a "warm-up" period before taking a test. For example, if taking a math test, he would need a few minutes of quiet time before the test to do a few math equations, to refresh his memory on the various formulas. If he did not have that quiet time to recall the information and bring it to the surface, he found it impossible to recall the data sufficient to pass the test. In past instances, he had some professors that allowed him to remain outside the classroom for a brief period, before the test, to allow for this "warm-up" and his test results were much better.

He noted that his TBI, and its residuals, causes fatigue. He liked the process of learning, overall, but found it to be more difficult post-TBI. He noticed that he gets easily frustrated with his learning activities when lessons and tasks are not solidifying, as they did pre-TBI. He used digital calendars to keep track of his assignments, otherwise, his time management would be terrible. He tried to work his assignments a week in advance, and this was a result of self-awareness of his deficiencies in time management. This

process offered him a scheduling buffer, and it assisted with the reduction of unnecessary stress from the fear of falling behind in his course work. He noticed that he learned best with video lessons, and many of his instructors were good about responding to him with additional video lessons for feedback.

He noted that his learning preference was dependent on the topic, and there were some courses where practical application and hands-on were necessary and beneficial. He mentioned some difficulty with foreign instructors, when English was not the primary language, and with professors who had more than 400 students, and responses were slow or nonexistent. His school had a good supply of video tutorials, but some of the software platforms that the school used had varying directions for formula entries, which were confusing and difficult for him to remember. This cost him a loss of points on assignments and tests.

He did not find discussion post useful because he felt that most people did not put much effort into them. He did feel that group projects were useful and had good experiences with the projects that he worked on in the past. He had mixed feelings about his interactions with his professors, and much of this had to do with online learning, language barriers, and time zones for the assignments.

His online professors did not specifically know about his TBI. He told them that he was a "slower learner" and that if he asked questions, it was because he genuinely needed more assistance. He indicated that when he attended a brick and mortar college, he did receive a VA disability letter, but did not receive any specific or dedicated assistance for learning.

He stated he was loosely aware that his online college had ADA services, but since he had a VA disability letter previously, and didn't receive much help at the brick and mortar schools, he was not optimistic that an online university would be any different so he had not notified them. He noted that he broached this with three different universities in the past, and each one had different processes and policies, but none that helped his issues, specifically. These instances occurred between 2012-2019.

P5's symptoms included fatigue, lack of retention, and difficulty focusing. He discovered he learned more effectively if he reduced the lessons into smaller sections, or chunks, and learned during shorter durations. Additionally, he experienced light sensitivity and headaches, which influenced the amount of time he was able to work on his computer; he had to continuously wear sunglasses to mitigate the light sensitivity. These factors also altered the duration required to learn. He discovered that taking a few quiet moments before a test, and doing practice problems, acted as a warm-up for his brain, and helped him to recall the information required to pass the exam. Without having this warm-up session, his test scores drastically suffered.

He noticed that he learned best with video tutorials and remarked that many of his instructors often provided additional video lessons to assist him. He did not specifically self-admit his TBI disability to his current online college but did tell his professors that he was a "slow learner." With his disability, he attended two other brick and mortar colleges and he possessed a VA disability letter that explained the extent of his TBI, but it did not explain or describe what he needed in terms of learning assistance.

He expressed frustration with the inconsistency of the processes of each school at

accessing his disability and learning needs and, in the end, he indicated that each school seemed to have cookie-cutter programs that were not specific to the learner. He has not notified the online university of his disability because he was not optimistic that their policies and programs are any better than what he experienced in the past.

P6

P6 reported that he learned most effectively by taking in data in small chunks. He was unable to learn material over a semester and then test on that material at the end of the semester. Fortunately, his coursework was not set up that way. For example, he explained that he may be assigned a paper that he began at the start of the course, and the paper progressed in stages and as the material is learned, culminating as a final project at the end of the course. Or, blocks of lessons were learned and tested as they were covered (weekly) rather than being tested on large amounts of information at the end of the semester. These smaller "chunks" of information were easier for him to learn, retain, and apply. Motivation was a challenge, but he was not sure if that can be solely attributed to TBI or whether it was a result of comorbid conditions in conjunction with his TBI. Time management was also a challenge, along with prioritization of tasks.

To be clear, it was difficult to pinpoint precisely when his TBI occurred. His duties in service exposed him to repetitive and continuous concussive and over-pressure events, and it was suspected that his TBI was a result of these repetitive exposures. He reported a decline in his cognitive abilities while in service and was adjusting, on a daily basis, to continue operating. It became "the new normal" to mitigate these effects.

He learned best through visual means. Reading text was his least favorite means

of learning, as he tended to lose focus and interest. He was not aware of any technologies that were available from the school that would assist him. He did not like group projects because his experiences with them were not positive. He felt that most people did not put forth the appropriate effort.

He has had mostly positive experiences with his instructors. He mentioned one instructor that provided videos for every lesson, and videos for all the assignment feedback, which he felt went above and beyond what was necessary. He was extremely impressed by this and noted that the extra efforts made by this instructor were helpful to him. He did not self-admit his TBI to any of his instructors. He did not seek assistance from the college and was not aware of any ADA programs for his disability.

P6's TBI symptoms were a bit different than the other participants, in that they occurred over the span of many years and through repetitive and continuous concussive-type events. Because of this, the symptoms developed and progressed slowly over a longer duration of time, rather than from one or two specific and traumatic accidents or events. Unfortunately, his TBI was not diagnosed for many years. He struggled with cognition and retention, and he did better with course designs that were project or paper-based, rather than test-based.

He discovered that he had to learn the material in smaller chunks, and he noted that visual methods provided him with the most productive and effective learning. He mentioned one professor who provided additional lessons and feedback, using video, and he found this to be extremely beneficial. Reading text was challenging for him because he would lose focus too easily. He reported that he had instances of reading textbooks,

noting that time elapsed, and pages had flipped, but none of the material had been absorbed. He did not self-self-admitted his TBI to his professors, or his school, and was not aware that any programs existed to assist with his disability.

Summary of Data Structuring

As a result of coding all participants' interviews, I identified nine primary codes and for clarity I used sub codes to hone in on specific issues that may be of use in future studies. This data was compiled from only the interviews. Table 4 contained the data matrix for the learning preferences of each participant. The data obtained indicated that five of the six participants preferred video learning methods over other learning methods. In instances where multiple formats were selected, participants indicated that their choice was dependent upon the topic of instruction; i.e. for mathematical problems, it was easier to see the problem being worked, than to listen, or read about it being worked.

Table 4

Learning Preferences

Codes Assigned	P1	P2	P3	P4	P5	P6
Audio	X					
Hands-on	X			X		
No specific preference		X			X	
Online learning						
is the only option		X				
Text works best	X			X	X	
Video works best	X		X	X	X	X

Table 5 below described the primary code of symptoms of TBI. It is further broken down into sub codes for each participant related to their identification of the specific symptoms of TBI they have experienced. This table depicted the range and

severity of TBI injuries between the participants. Of note, five of the six participants experienced headaches and four of the six reported forgetfulness/memory issues as residual symptoms of their TBI injuries.

Table 5

Symptoms of TBI

Codes Assigned	P1	P2	P3	P4	P5	P6
Mini-strokes/Neuro		X				
Eye issues		X				
Fatigue		X			X	
Forgetfulness/		X	X	X	X	
Memory	X	X			X	X
Headaches	X	X	X	X	X	
Studder		X				
Tinnitus				X		
Vertigo			X			
Light sensitivity	X			X	X	

Table 6 below identified the codes for each participant and the learning changes identified after their TBI. There were the distinguishable differences noted between pre and post TBI learning. All six participants noted that learning new material took more time post-TBI, and five out of six participants noticed a decrease in their abilities to retain information and comprehend new information.

Table 6

Learning Changes after TBI

Codes Assigned	P1	P2	P3	P4	P5	P6
Lack of retention		X	X	X	X	X
Lack of comprehension of new material	X		X	X	X	X
Lack of focus/hard to focus					X	X
Forgetfulness		X			X	X
Mental health issues impact motivation		X				X
Mental fatigue	X		X			
Takes more time to learn	X	X	X	X	X	X

Table 7 below identified their preferences for the various learning methods in their online courses. The participants discussed the benefits or difficulties responding to specific instructional methods during their online courses. The most significant data from this table is that four out of six participants expressed difficulty and challenges with schedules and assignment due dates. The two primary factors involved with these challenges were time differences, and due dates across assignments when taking multiple courses.

Table 7

Learning Methods Online

Codes Assigned	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Found discussion helpful	X	X			X	
Found discussions unhelpful			X		X	
Found group projects helpful			X		X	
Found group projects unhelpful			X		X	
Found tests helpful	X			X		X
Found tests unhelpful		X			X	
Found writing papers helpful	X			X		X
Found writing papers unhelpful			X		X	
Participated in courses without other student interactions						X
Experienced scheduling issue	X	X	X			X

Below in Table 8, the participants described their responses to mitigate their TBI symptoms in response to their online courses. These mitigating techniques were methods that the participants discovered, on their own, to circumvent their TBI learning challenges. Again, and similarly to the severity and range of the TBI disabilities, the mitigating techniques also vary in their amounts and stringency. Four out of six participants noted that they required frequent breaks and that they needed to learn the material in small "chunks."

Table 8

Mitigating TBI Symptoms

Codes Assigned	P1	P2	P3	P4	P5	P6
Needs quiet for studying/learning			X	X	X	
Needs organization/schedule to assist with focus		X			X	
Must refocus when frustrated	X	X			X	
Takes frequent breaks/learn in "chunks"	X	X		X	X	
Takes video notes					X	
Uses technology-assisted devices for learning	X					

Below in Table 9 are the codes for these participants' emotions described in their interviews as they responded to their online courses. Self-doubt was recorded by four of the six participants. Five of the six participants indicated that external motivation played a role in their drive to overcome their challenges and succeed in their educational goals.

Table 9

Emotions Related to Learning

Codes Assigned	P1	P2	P3	P4	P5	P6
Feeling overwhelmed	X					
Increased anger, frustration, embarrassment	X					
Self-doubt	X	X	X		X	
Motive; help another veterans/team		X	X			
Motive; something started must be finished		X				
Motive; personal achievement				X		X
Motive; financed by military	X		X			
Motive; kids/family	X					

In Table 10 below are the negative learning experiences expressed by these TBI learners as they responded to their online courses. This section did not show a consensus between the participants. Each participant had their own unique negative experience(s), which may or may not have been shared by the other participants.

Table 10.

Negative Learning Experiences

Codes Assigned	P1	P2	P3	P4	P5	P6
Lack of interactions/engagement with other students	X	X				
Multiple sites to log into for a single course					X	
Learning software isn't compatible with various personal devices				X		
Time differences affecting due dates			X			
Technology that does not have user instructional courses	X	X				

Below in Table 11 are the codes associated with the positive learning experiences of these TBI learners. Note that only P3 indicated good interactions with other students. The other participants did not find group activities and discussions enjoyable, which caused this coding result. All six participants noted positive and productive experiences

with their professors.

Table 11

Positive Learning Experiences

Codes Assigned	P1	P2	P3	P4	P5	P6
Positive learning experiences			X			
Good interactions with other students			X			
Helpful professors/Advisors/Mentors	X	X	X	X	X	X

Below in Table 12 are the codes identified for the participants' engagements with ADA services. Four of the six participants self-admitted their TBI to their professor(s). Of the four who self-reported, only one teacher guided the participant to ADA services and made the participant aware of ADA services provided by the university. The other three participants were not offered or told about ADA services offered by their school however, the professors aided them by providing additional instruction, guidance, and extensions on class assignments. P5 self-admitted his disability while attending a brick and mortar school but was dissatisfied with the assistance he received. Based on this, he did not self-admit his TBI while attending his online course which accounted for his responses to both statements. Four of the six participants either did not view their TBI as a disability or were not aware of ADA assistance for their disability.

Table 12

ADA Services

Codes Assigned	P1	P2	P3	P4	P5	P6
Self-admitted to professors/teachers		X	X	X	X*	
Did not self-admit to professors/teachers	X				X*	X
Experienced unhelpful results with disability offices					X	
Did NOT ask for ADA help	X		X	X		X
Did not recognize TBI as a disability			X			
Was not aware of ADA assistance	X			X		X
Received more time to complete assignments		X	X		X	
Received technology-aided assistance		X				

*P5 had experiences in both categories, under ADA

Summary

The major coding categories included learning preferences, symptoms of TBI, learning challenges after TBI, learning methods online, mitigating TBI symptoms, emotions related to learning, negative learning experiences, positive learning experiences and ADA services. Sub codes were created to narrow the focus of the participants' answers, feelings, and experiences, as they related to each of the major codes. Lastly, the sub codes identified specific attributes, characteristics, or nuances associated with each major code.

Two sub codes were identified for all six participants, which included, (a) takes more time to learn, and (b) helpful professors and mentors. All six participants noted that the process of learning, post-TBI, was more time consuming than it was pre-TBI. This was due, in part, to the many mechanisms that the participants used to assist them with learning. They reported small windows of time, ranging from 30 minutes to an hour, in which they possessed clear focus and the ability to understand and absorb information more easily. When they pushed past this window, they often experienced frustration, and

this phase required frequent breaks to enable them to re-focus.

The participants also all agreed that after self-admitting their TBI injuries to their professors, their professors were incredibly supportive and helpful. The participants received additional time to complete assignments, in most cases. Some professors provided additional tutoring, through phone or videoconferencing, to assist the participants with completing their assignments. A couple of the participants noted that without this additional assistance from the professors, they would have failed.

The codes that were identified for five of the six participants included lack of retention, lack of comprehension, video as a learning preference, and they suffered from headaches. The lack of retention and comprehension are closely related, and the participants noted that these changes were very noticeable post-TBI. Retention and comprehension are major components to education, and naturally when the participants detected a decline in these abilities there was also a multitude of associated feelings and emotions intermingled with the loss of these attributes.

Five of six participants also agreed that they favored and preferred learning via video over text or audio. Lastly, five of the six participants indicated that they suffered from headaches because of their TBI injury. This is significant, concerning the physical limitation that headaches or migraines would have on learning, to include the limitations for the online learner staring at a computer screen.

The codes that were identified for four of the six participants included self-doubt, memory issues, forgetfulness, scheduling and assignment due date issues, taking frequent breaks, learning in chunks, self-admitted their TBI to professors, and did not ask for

ADA help. The participants experienced self-doubt, as it related to the changes post-TBI and how they were going to navigate their way through online learning with the various mental, physical, and cognitive changes they were experiencing. The participants noted their memory issues and their forgetfulness, and this coincided with the challenges they described with scheduling and assignment due dates. Four of the six described difficulty with keeping up with assignment due date, and this was especially relevant as it related to time differences.

The participants described being enrolled in more than one course, with various time differences, and having difficulty keeping up with due dates for discussions, discussion responses, and assignments. They noted that using electronic calendar reminders were helpful, but that there were instances when their various class discussions, discussion responses, and assignment due dates were not aligned when taking more than one course, and this was challenging for them. The memory and forgetfulness can tie into issues of time management, which could explain the association with the scheduling.

The codes identified for three of the six participants included that writing papers were helpful, tests were helpful, discussions were helpful, being light-sensitive, text learning was helpful, needs quiet, must re-focus when frustrated, and received more time to complete assignments. In terms of the types of learning, three of the participants indicated that writing papers, tests and discussions were helpful in the online learning forums. Interestingly, half of the participants noted light sensitivity as a symptom of their TBI, which impacted and limited their abilities to work with computers; one participant

reported that he had to wear sunglasses almost all the time to minimize his symptoms.

In terms of mitigating their TBI learning abilities, three of the participants learned that they required absolute quiet to learn or study. Without it, they simply could not focus. When they experienced frustration while they were learning material, they discovered that they needed to walk away, and take a short break, before re-engaging with the material. The participants described this post-TBI frustration when learning as a definitive barrier that they were not able to simply push through without taking breaks. Lastly, the participants described receiving additional time from their professors to complete their assignments.

The codes that were identified for only one or two of the participants were (a) they enjoyed hands-on learning and, (b) they had no specific learning preference. The participants, overall, indicated that they preferred video learning however, they also noted that this was dependent on the course of instruction. For example, in this category with hands-on, the participant was in a course where they were designing an actual object and hands-on practical applications were required and necessary.

In summary, the patterns among the majority of the six, five or four of the participants consisted of the need for more allotted time for learning, post-TBI, because they require more frequent breaks; i.e., breaks due to frustrations, learning in chunks, and repetitive reading and writing of material for retention. Online professors assisted the participants after being notified of the TBI injury, however, students did not ask for ADA help themselves. Lastly, the participants struggled with self-doubt because of their memory, forgetfulness, lack of retention, lack of comprehension, and other TBI

symptoms.

Using the transcribed and coded interviews and the journal questions, I evaluated the code co-occurrence for the data. Four major co-occurrences in Table 13 were identified, which supported the themes I have identified for the focus of this study. I will discuss each of these codes, share the significant statements made by the participants, discuss the statements' relevance to each code, and how each influence the themes.

Table 13

Code Co-Occurrence

It takes more time to learn. (Personal learning characteristic/physical, emotional/cognitive)	17
Helpful professors/mentors/advisors (interactions in the classroom/ADA/UDL)	16
Lack of retention (personal learning characteristics)	16
Learning changes after TBI/mitigating TBI (how they responded to a classroom)	15

The three themes identified for this study were (a) the physical, emotional and cognitive changes identified by these participants as they participated in online courses, (b) the ways that these participants mitigated these changes in their learning resulting from their TBI, and (c) the experiences in their online classrooms to respond to their TBI learning characteristic.

Theme 1 was the physical emotional and cognitive changes. Included in this theme were the combined mental, physical, emotional, and cognitive changes, post-TBI, that affected learning, and required additional time to learn. As noted previously, the range of symptoms from TBI injuries vary in severity. This variance also carries over to

the challenges experienced with learning processes, as was evidenced by the results of the interview and journal answers. Despite the variances in ranges, each participant reported mental, physical, emotional, and cognitive influences upon their academic performance, and agreed that learning required more time because of these factors.

Theme 2 was the mitigation techniques described by the participants as they learned new ways to learn. Each participant discovered what could be described as a work-around for learning post-TBI. Some described requiring absolute quiet when taking in new material because having any type of secondary stimulus (i.e., music, conversation, or background noise) would pull their focus from the lesson. They discovered that they learned best in short durations of 30 minutes to an hour and that trying to push past that time limit would result in a loss of the information, or loss of focus.

In addition to this bracketed learning time is the actual amount of data they reported they could absorb in a learning session. They discovered that learning in "chunks," by breaking down large lessons into smaller sections, was better for retaining the information. Some noted that repeatedly taking the same notes helped with retention, while others relied on audio notetaking.

Of interest were the remarks made by some of the participants, about how they compared their success with learning and testing methods. Many noted that they did much better with projects and papers that were compiled and created as the class was progressing. They all agreed that being tested on material became increasingly difficult the longer the duration was between the presented material and the test, itself (i.e., weekly test versus quarterly test). Each participant was able to recognize their individual

post-TBI learning challenges and, without the assistance of professional counselors, discovered methods to mitigate them.

Theme 3 consisted of the interactions within the classroom and included the faculty, the university ADA office, and a participant who experienced an online self-paced course. This theme encompassed several facets of the interactions in the classroom. Most participants described a complete lack of knowledge about ADA services and assistance that would be applicable for their TBI disabilities. One participant was enrolled in an online self-paced course and opted for this program of study because of retention issues.

Specifically, he discovered that he was able to articulate and demonstrate his knowledge through written papers, which was the predominant method in his course. He had the benefit of both an academic mentor and a course mentor. He engaged in weekly conversations with his course mentor, and these discussions kept him on track, and kept his mentor apprised of any personal or professional issues that delayed his studies. This consistent and active dialog also prevented reactionary changes to his program since alterations could be forecasted in advance. He acknowledged that were he enrolled in a test-based course, post-TBI, he would not have fared well.

Professors and mentors were helpful after disclosure of the participants' TBI, but only one professor directed the student to ADA services or programs. The participants described various assistance that they received from their professors. This assistance ranged from phone calls and video/teleconferencing to give focused and one-on-one help

with lessons, and papers, projects, to texts and calls to provide reminders, health and safety checks, and extra motivation.

One participant described a professor who created video lessons, discussions, and even feedback for individual projects and papers, and the participant found these videos extremely helpful because he could pause and replay them, as needed. At least half of the participants reported receiving additional time for assignments and projects after self-admitting their TBI and working with the professors to complete their course(s) and/or degree plan. The issue of requiring more time to complete tasks for learning was a consistent theme throughout the study, and it routinely intersected with other issues and sub issues. Lastly, a notable sub issue within this theme was that only one professor, upon being made aware of the TBI disability, shared any ADA services that their university had available. The ramifications and recommendations of these issues will be discussed further in Chapter 5.

Evidence of Trustworthiness

As mentioned previously, credibility, in qualitative research, was dependent upon three elements, and included the use of rigorous techniques for gathering and analyzing data, ensuring that the researcher was experienced and trained, and lastly that there was value in the qualitative inquiry (Patton, 1999). I used reflective journaling during the entire process of the study, and this was separate from the notes that I kept as I conducted the interviews, listened to the audio files, transcribed the audio files, and during the coding process. Reflective journaling was an analytical process that allowed me to reveal the various feelings, thoughts, and emotions experienced with the study, participants, and

on the processes *after* they occurred. It allowed me to record and evaluate the inter-subjectivity of the relationships between myself and the participants, including the conversation flow, tone of their voice, and any other nuances that may have been subtly expressed, but not necessarily captured in text. I was able to express connections that I faintly noted, patterns as they began to emerge, and decipher internal biases.

I conducted member-checking (McGrath et al., 2018) with the participants, and sent each one their respective transcribed interview for their review to verify the accuracy. I offered a follow-up interview and the opportunity to edit their transcribed interviews; P1, P2, P4, P5, and P6 responded and were satisfied with the transcribed interviews. However, P3 did not respond to repeated attempts to verify the transcript. Of note, this participant did travel frequently, and may have been out of the area, rather than disinterested or disenchanted with the study.

Transferability was an aspect of providing a rich and thick description of the study, the participants, and the process which enabled a reader to transfer the findings to their own setting (Korstjens & Moser, 2018). l engaged in memoing throughout the study and used Keen's (1975) model of data analysis for structuring my analysis and this process of maintaining structured data analyses allowed me to explore all of the data in-depth, while preserving an audit trail (White, Woodfield, & Ritchie, 2003).

I used open-ended, thought-provoking questions that allowed and encouraged each participant describe their experiences. The narrative-type answers often included the method of storytelling to describe and relay the thoughts, feelings and emotions related to their pre-and post TBI learning experiences. I attempted to gain diversity in my study by

removing any form of gender, age, race, branch of service, years served and geographical location restrictions from my recruitment criteria.

With regard to dependability, I ensured that there was transparency during the process of this study which included the description of the study, maintaining the records, logs, journals, and all other forms of research documentation (Korstjens & Moser, 2018). I maintained multiple sources of data including initial interviews, transcript verifications, follow up interviews (if required), and participant journals. These data sources, which also included the timeline of events recorded in my notes and reflective journals, created a transparent audit trail that assisted with supporting continuity and dependability.

Confirmability in qualitative research was closely aligned with dependability and record-keeping and included my ability to maintain objectivity and reduce bias (Korstjens & Moser, 2018). The interpretation of the data was not based on my point of view, my prejudices, my biases, or beliefs. Rather, it was objectively assessed by and through the collected data. Reflectively journaling enabled me to express any thoughts, concerns, and questions about the study and the participants, and forced me to objectively evaluate my own interactions, as a researcher, as I evaluated the data.

Ethical Procedures

I understood and was empathic to the need to respect and protect the rights of each participant during this study. The procedures for this study were outlined, submitted, and approved by the Walden University IRB; a second IRB revision was submitted to adjust recruitment inclusions, and these protocols were followed in their entirety. Each participant was provided with information on the research study, and the procedures of

the study as outlined in the informed consent form. Each participant was advised that they had the option to refuse to participate in the study and could withdraw at any time.

To protect the participant's right to confidentiality, all identifiable information was removed, and participants were identified using an alpha-numeric code (P1, P2, etc.). Additionally, any geographical locations mentioned, university names and locations, and military duty stations were also removed. Because this topic can be a traumatic one, each participant was offered the location of either a military or veteran's administration medical service center, in the event they felt they needed to seek additional assistance. They were reminded that the number to the Veteran's Crisis Line was also listed on the informed consent form, which I encouraged them to keep for their records.

Lastly, I am the only person who had access to the participant's interviews, journals, emails, and texts, which contained personally identifiable information. All data was stored on a password-protected laptop, which only I had access to, and the files were in a password-protected file. Upon completion of the study, all data will be transferred to a USB drive which will be stored in a locked firebox for five years. Additionally, I will correspond with Dedoose and request that they delete the data that was uploaded into their secure program, upon completion of the study. After five years, I will destroy the USB drive.

Results

The themes that resulted from this study were derived from the interviews and journal responses, and the number of times these issues were discussed, addressed, or mentioned during the participant's collective experiences. The three primary themes were

(a) the collective physical, emotional, and cognitive changes described by the participants, (b) the mitigation techniques and processes they discovered to develop productive learning responses and, (c) the efficacy of the interactions within their online classrooms.

Theme 1. Physical, Emotional and Cognitive Changes

The first theme identified was the impact of the collective physical, emotional, and cognitive changes that occurred post-TBI, and how those changes impacted the participant's learning processes. Also, the sub-theme identified was the lack of retention as a commonality described by these participants. Through the review of the participants' statements, many of the complaints of lack of retention were also followed by the mechanisms used to assist them in their retention efforts, such as need for additional time, and will be discussed in Theme 2. Table 14 below identified specific quotes of the participants to define the changes described.

Table 14

Takes More Time to Learn

Data Source	P	Significant Statements
Journal	P1	I have no ability to retain information unless I write it out time and time again, and that impacts my ability to pass written tests
Interview	P2	It's shot. Good luck. I can't focus on anything for long periods of time. I have to take lots of breaks, which means that it takes longer for me to get things done because I have to take so many breaks
Journal	P2	Prior to my TBI I excelled in school with no problems. I hardly had to study to pass a test with an A. Now, I have to study a lot to comprehend and form competent sentences that the professor can understand. It frustrates me.
Interview	P3	Look, I still can't concentrate – I sit at a computer and I just stare at it for hours, and I can't write. Once I started to get on the meds, it was near instantaneous, I was able to focus, I was able to concentrate. I would have to reread things numerous times. I would have to ask for more help than normally, I felt. What else….my whole course was online so, we did have to meet once a week. I had to re-watch – because they recorded every classroom session (Blackboard session), so I had to re-watch those when normally I didn't have to before. My note taking wasn't as good – I noticed that. I wouldn't say that I was an excellent notetaker, but definitely my handwriting wasn't as good. And, just TIME, I needed more time. I needed more time to understand things, comprehend things, so that's what I really related to the symptoms
Interview	P3	So, it was significant. So, I was finally finishing my master's around that same period, 2017, and what was supposed to take a semester to finish your final project – it took me a year

Subissue - Lack of Retention after TBI. In this theme of changes after TBI, each of the participants reported challenges with retaining new information and transitioning new information from short term to long term memory. This facet was closely intertwined with the mitigating methods that the participants learned and discovered on their own, to work through their learning challenges. Table 15 depicts the participants' experiences with their lack of retention, and how this impacted their learning.

Table 15

Lack of retention

Data Source	P	Significant Statements
Interview	P2	And then when I've read it and when I'm done with the class, it's like my brain dumps the information, nothing stays in long term memory, really. Which kind of really sucks, because when I have to take the NCE, which is the licensing exam for mental health counselors, it's basically a hodge-podge of everything you learn from your Master's degree, and I don't remember half of it, or more than half…
Interview	P2	My normal typical every day TBI symptoms are I lose words, I forget things – everything – I don't understand what I'm reading when I read it. I have to read it several times, over and over again.
Interview	P3	I started to have severe focus issues, concentration issues, and drive/motivation type issues. And, I felt a significant decline in my memory, my abilities to be able to retain information, and really, to be able to comprehend it, as well. It took me a lot longer to comprehend something, or to understand something, after I read it, or after I had done it, versus before. So, mostly cognitive
Interview	P4	Yes, it's very difficult for me to read and process that into memory.
Interview	P4	I can hear things and process it into memory, and I can hear something and take notes and that does kind of help a little bit. But, for the most part, reading materials for me has to have a very short span between reading and taking the test. And what that does for me is, I have to take what I know and put it in one section, and take what I don't know and cram it, and then take my test.
Interview	P4	Part of my (topic removed) classes, the hardest class that I had to do was (class topic removed) and the reason why I had to take that class was because I had to memorize all the mathematical formulas for stock evaluations, bond calculations, interest rates, coupon payments and things along those lines. What I can tell you, now, is that I studied them. What I can't tell you is the formulas. I can generally look at things and know if it's right or wrong – all those formulas that I had to memorize for the test were gone as soon as the test was done. And that's probably how it happens the most for me. Even with spoken lecture, it didn't really calculate or compute for me.
Interview	P6	I think a lot of it just being able to retain the information for a period of time. I take my studies in little blocks and approach each assignment and I deal with it at the time. If I had to probably go back, if the program were set up in a way, if you had to do like an end of term test, I think it would impact me a lot. Being able to recall the information from the start of the term towards the end of the term would be a lot tougher, as opposed to approaching each module that I have individually. It doesn't really culminate at the end unless I'm writing a paper. And you're writing the paper from the first week of the term until the 8th week of the term, so you've already basically tackled that piece of the paper. If it wasn't set up the way that it is, I would probably struggle a lot more academically.
Interview	P6	As I have mentioned before, the fact that the learning modules are designed to work week to the week, I'm able to finish the studies and move on to next challenge. If I were required to do a semester exam at the end of the eight week period, I believe that I would have real challenges as it related to retaining the information over a longer period of time.

Summary. Primarily, the participants required additional time to complete the learning processes, and closely intertwined and interdependent with this was the additional time required for the mitigation techniques they developed to help with their learning. Each participant discussed the amount of time required to learn, post-TBI. The process, itself, for learning post-TBI, takes longer because frequent breaks are necessary, the material has to be learned in smaller chunks to help with retention, and when frustration occurred, the participants described the need to step away from the task for a brief period to regain control of their focus and emotions. Additionally, there can be physical and mental challenges that compound the amount of time spent on learning. These issues were expressed by each of the participants, in varying extremes. Just as the learning process is unique to each learner, so too is the impact of this disability on the interruption of processing, retaining, and applying new information in the online educational forums.

Theme 2 Mitigation: What They Do in a Classroom Post TBI

This theme encompassed the processes that the participants put in place to mitigate the learning challenges they experienced because of their TBI and the related residuals associated with the TBI. The participants were not counseled or trained, formally, on how to develop these mitigating techniques. They discovered and honed the various mitigation methods through trial and error, and employed their own self-efficacy, motivation, and internal drive. Table 16 captured excerpts of the participants' descriptions of their mitigation methods.

Table 16.

Mitigation

Data Source	P	Significant Quotes
Journal	P1	I can honestly say that I have had to adapt the way I learn dramatically. I have no ability to retain information unless I write it out time and time again, and that impacts my ability to pass written tests. (This is primarily why I am an (rank removed) at (years removed) in my opinion as well). I try, I try so hard, but since the explosion I've just had a difficult time.
Interview	P1	My ability to concentrate is very, very good for the first, I'd say, 30 minutes. I can really focus on the assignments, or if there is a paper that needs to be done, a research paper, I can… I'm really productive within the first 30 minutes or so, but then I have to take a few steps back and better evaluate because my thought process goes to other things (garbled).
Journal	P2	And I have to also make sure that I have an annotation for the time zone, because I'm not in the same time zone as my instructor, I have to make sure I have THEIR time zone because that's when the paper is due – by midnight THEIR time zone. So, I have to make sure I have the right time zone down and I have to organize my desk in a way that I know where everything is. Everything has to be in its place – it's like OCD. I have to be REALLY organized. I annotate what time assignments are due in MY time zone, but also when they are due in THEIR time zone, so that's what's important.
Interview	P3	I needed that quiet time during the night to do it. And then, obviously I'm tired already, so that kind of affected things. Yeah, I would definitely say I got things in on time, but they were often near the deadline because I just couldn't concentrate
Interview	P4	I have to be in a spot that has little to no distractions – almost no background noise. Because for me to concentrate background noise prevents a second input and prevents whatever the first input is from settling. It happens to me during conversations too. If I'm having a conversation in a restaurant, and there is a whole lot of noise, that conversation is mostly forgotten because if there is enough background noise it just gets lost – it doesn't really process.
Interview	P5	I would say, for me, I'm easily distracted, and I do have some short periods of time where I can really focus. Probably the hardest thing for me about school is going in to take a test, in that generally, you walk in, the professor hand you the test, you sit down and take it – if I don't have any kind of warm up at all – usually I try to sit there for 30 minutes to an hour just prior to the test and just work a bunch of problems – but if we go in and the professor talks for some amount of time, I kind of lose all of that. So, the classes where I've done the best is where the professor will work with me, where I'll say, "hey if you're going to do some kind of introduction or just talk for a little while, if I could just stay outside and just keep working problems and then come in and take the test, that's good." If they want everyone in there, and they are going to describe the test and how they grade it and not do any of the actual material on the test it's really difficult for me. So, I have to be mentally warmed up

Subissue - Learning changes after TBI. The participants each described the ways their learning had changed post-TBI, and they had to discover ways to mitigate

these new learning challenges. Additionally, they experienced various mental, emotional, cognitive, and physical disabilities that were a result of their TBIs and interfered with their abilities to learn. For example, pre-TBI, they were able to learn using text however, post-TBI that learning method had to be replaced by audio or video because they could no longer absorb the material by reading alone. And, because of varying TBI residuals such as eye disorders, hearing disorders, and headaches, their screen time had to be reduced, audio enhancements were required, and technology was needed to augment their learning materials. There were mixed reviews on their perceptions of interactive technologies in their classrooms, as most of the participants felt that they added confusion and frustration to the course of instruction. Table 17 showed the participants discussions about their learning challenges after their TBIs.

Table 17

Learning changes after TBI

Data Source	P	Significant Statement
Interview	P1	My ability to concentrate is very, very good for the first, I'd say, 30 minutes. I can really focus on the assignments, or if there is a paper that needs to be done, a research paper, I can… I'm really productive within the first 30 minutes or so, but then I have to take a few steps back and better evaluate because my thought process goes to other things.
Journal	P1	Adapting and overcoming is what we do in the military. If something isn't working, we adjust fire and do what we need to adapt and overcome. The same is true with my education. I am very close to securing my Bachelors (redacted), and while my TBI has not made this easy, I have found ways to manage my time appropriately to get it done. The time I make for it, I force myself to just sit there and do it until the job is done. If I get frustrated with the work for whatever reason, I'll pause, walk away, recuperate and readjust, and come back until the job is done
Interview	P2	It's shot. Good luck. I can't focus on anything for long periods of time. I have to take lots of breaks, which means that it takes longer for me to get things done because I have to take so many breaks
Interview	P3	ah, I mean, I was angry. I was angry, I was upset because I couldn't – I wasn't feeling like I was normal. Like, I wasn't feeling normal anymore. I wasn't feeling like I could pick stuff up as quickly as I used to pick stuff up. And then, after taking

		all the tests initially out in (name of state removed), they were like, "You're still scoring off the charts. You're fine.." But, then I'm like sitting there telling them, "No, I'm not. I'm completely different than what I was."
Interview	P3	It was horrible. It was – it definitely affected my sleep because I had to stay up extremely late, 1 or 2 in the morning to finish things. I couldn't concentrate during the day. For some reason, I needed that quiet time during the night to do it. And then, obviously I'm tired already, so that kind of affected things.
Interview	P4	I can hear things and process it into memory, and I can hear something and take notes and that does kind of help a little bit. But, for the most part, reading materials for me has to have a very short span between reading and taking the test. And what that does for me is, I have to take what I know and put it in one section, and take what I don't know and cram it, and then take my test.
Interview	P5	I would say, for me, I'm easily distracted, and I do have some short periods of time where I can really focus. Probably the hardest thing for me about school is going in to take a test, in that generally, you walk in, the professor hand you the test, you sit down and take it – if I don't have any kind of warm up at all – usually I try to sit there for 30 minutes to an hour just prior to the test and just work a bunch of problems –

Summary. The participants expressed noticeable differences in their pre- and post-TBI learning processes, and the frustration associated with these differences. In pursuit of their educational goals, they had to find ways to work around these various learning challenges, as they were discovered. Some described needing to learn new material in small portions, or "chunks", and the need for frequent breaks. One participant specifically noted that he could only focus for 30 minutes at a time, while others described similarly short learning durations of 30 minutes to an hour. Each of the participants expressed frustration and anger when learning new material, and when the material was not being comprehended.

Frustration and anger were not new emotions in relation to learning. These emotions can be a relatively common occurrence to experience when the material is not immediately being absorbed. However, in these cases, there was the additional weight of comparison, as each of the participants were able to describe their learning abilities pre-TBI and post-TBI, and internally, this comparison fueled these emotions. The online

learning forum offered the flexibility of working at their own pace and taking as many breaks as they required. Alternatively, the online forum did pose its own set of challenges by way of the availability of preferred learning methods, availability of extra instruction or instructional assistance, and confusion with schedules, due dates, and technology.

Theme 3: Interactions Within the Classroom

The third theme is the topic of these participants' interactions within their classrooms. Several sub-topics were developed from this theme, and included helpful faculty, ADA, and online self-paced courses. Only one participant was enrolled in a self-paced style of course instruction, but his statements regarding this form of instruction, and about his TBI, were relevant and important.

Subtopic 1: Helpful faculty

The participants remarked that their professors, advisors, and mentors were immensely helpful after they self-admitted their TBI. The professors often provided additional instruction, in the form of videos, teleconferencing, texts or phone calls, to better assist their students. Each of the participants who self-admitted their TBI lauded their professors for their contributions of providing extra time and attention to assist them with completion of their course(s) and program. The participants described their interactions as positive and supportive. The professors, once apprised of the TBI injuries, provided additional tutelage, at hours that were convenient to the participant, in addition to health and safety checks, and motivational follow up calls. Below in Table 18 were significant statements by these participants.

Table 18

Helpful professors/mentors/advisors

Data	P	Significant Statement
Interview	P2	Instructors were really good instructors. Most of my instructors were really understanding. They were so – so amazing. And I really have to hand it to them, I really like them. A couple of them really made the class a lot of fun.
Interview	P2	Yes, just by getting that extra time to be able to sit there and focus and concentrate on the material actually allowed me to catch up, because I was like, "Fuck, I'm drowning – why am I drowning?" I'm never drowning in education. I'm always the best student. I'm always the one who is on top. And it wasn't like that during that first term. And it didn't take long for me to start sinking either – it was like within the first 3 weeks that I started sinking. And that's when my professor and I had that conversation and even though my stuff was late because we identified what it was, both of my professors gave me the normal credit. Had I not had that letter of accommodation– even without that letter for the first 3 weeks – they were like, "This is what is going on with her and we need to do something about it…" And, they did, and they were really good about it. They were really, REALLY good about it, which surprised the hell out of me. But, my teachers have been fricken amazing. I mean, there are so many of my professors who, once I emailed them and said, "Hi, I'm (name omitted). I'm going to be in this class this term, and I have a traumatic brain injury, and I have a letter of accommodation. If you have any questions, comments or concerns, please contact me via email or this is my phone number." So many of my professors would call me and go, "What happened? Why do you have a brain injury?" Because they wanted to know, because in this career field, they are going to be dealing with people with brain injuries.
Interview	P3	The instructors knew about my TBI at the end but only because it started to get worse. I was doing well at the beginning of the class – it was kind of like a lust period where you're just kind of pushing through. I got accepted and I was able to establish – but then, I moved from (location withheld) to (location withheld), and then, so….towards the end they knew. Things had started to go downhill with the concentration and focus, so I self-admitted. I basically said, "Look, I need more time." And all of them were really cool – they were really awesome. They were like, "Okay, we understand. You need to get it done still. We still need to hold you accountable to get it done, but what time do you need?" And then, a couple of them would talk to me at odd hours, they would try to explain things to me two or three different ways. I spent 2 hours on the phone with this one professor – she was amazing. She could tell, on the phone, when I was just lying about understanding it, So, I think the interaction was nice.
Interview	P6	I've had mostly positive interactions with my online instructors. They were all motivated to do – to have the students do the best job they could. I haven't had any really negative experiences. I mean, I've probably seen some who have had more interest than others, but I think as a whole and on an average they all took their jobs seriously. I've been pretty happy with the experiences I've had with my instructors. Some were just exceptional, like the one individual who made the videos on each and every assignment, and then he would do a feedback YouTube video on your assignment, and he did that for every student, and for every single assignment, which I thought went above and beyond. So, when it came to evaluations I couldn't praise that guy enough for the time that that took. But for the most part, I've had good experiences with my online instructors

Subtopic 2. Reference to ADA

The participants described a predominant lack of knowledge about ADA services for their TBI disability as it related to online learning. One participant had some

experiences with ADA services at a few brick and mortar schools in the past but noted a lack of continuity in the processes, and how the assistance was offered. Based on these experiences, he did not explore any services that may have been provided by the online school because he could not conceive how they may have been helpful. However, in contrast, P2 who had receiving ADA assistance from her school, indicated that the services and assistance she had been getting were extremely helpful. Table 19 below includes significant statements that describe the issues related to ADA.

Table 19

ADA Reporting

Data	P	Significant Statement
Interview	P1	No ma'am. I didn't even know one was available, to be honest with you. With the being on line, and me being there voluntarily, I didn't even think to go that route. Honestly, I'm trying so hard not to raise red flags for anybody because I'm trying so hard to earn my retirement and stay to 20+. And I've been pushing pretty hard through my injury. I was approved and cleared to go to (location removed), and when I got there they couldn't treat me even after the screening process said I could go. And its kind of set me back 3 or 4 years. And I'm trying so hard not to raise red flags and I think that applies education as well. I'm just trying to get through it.
Interview	P2	All of them know. They were more willing to help after they were aware. But they knew about it from the very start because at the very beginning of each term, I have to give them my letter of accommodation. And, because of that, we have a discussion of what my limitation are, and how my TBI works
Interview	P3	I don't think I was really aware that colleges had disability offices. Or, maybe I didn't really think that I had a disability Maybe they didn't know how to interface with this. It wasn't like I was in a wheel chair, at the campus. You know what I mean? It's kind of like an "Out of sight, out of mind" kind of thing. I did not. And knowing what I know now, I probably should have. They probably had a lot of resources. They probably would have bent over backwards. It was (name of school removed). Their infrastructure – and their IT infrastructure – and all the resources they had on line, I could have easily asked them, and I just didn't think about it. I was just focusing on what the (branch of service) could provide me. But, I should have
Interview	P4	I don't know that there is any kind of specific TBI assistance. I don't know that ours has a disability office. I've interacted with the Veteran's office for tuition assistance but never a disability office
Interview	P5	Maybe loosely aware. I already had this letter from the VA saying that I had a TBI. But, there is a lot of vagueness in what the VA will give you, and I don't know if that – I can't think of a tangible reason behind that, but basically I can go in there, talk to a doctor – it usually takes a few weeks for an appointment – and say, "Hey, I

		have this class coming up, is there a way you can give me a note that says, "(Name removed) has had his brain rattled. Can he jot some things down? " And then the next step is you take it to the university, you see some people and they want to run their own series of tests, so it's not – I have not experienced a straight forward process. And that's three different universities – they all did it different. I haven't seen a way where the outcome is useful at all. They have all been different.
Interview	P6	I wasn't aware that there would be any kind of programs out there to assist with it. And I think if the structure wasn't set up the way it was, with the ability to divide up big chunks of material – I mean, even though you're building it on the classes – if I would have to cram for final examinations on everything I learned, it would be a lot tougher. So, in a way, it's kind of set up for someone who has memory problems, like me.

This subtopic stood out because the majority of the participants were not aware that their school had disability services, that their TBI fell under the umbrella of a disability that would be covered under ADA, they didn't view their TBI as a disability, or a mix of all of the above. The participants indicated that the assistance they received from their professors was instrumental in helping them achieve their academic goals, post-TBI. This assistance occurred after self-admitting their disability to their professors, and each described that before their admission, they experienced self-doubt and thought they were going to fail their course(s).

Considering the number of TBI's reported and unreported each year, to include those that impact veterans, and in combination with the popularity of online learning, the comments from the participants warrant further attention. As noted previously, while all of the professors assisted the participants who self-admitted their TBIs, and did so extremely well, only one guided or told the participant about any ADA services that may have been available from the school, itself. It is unclear, based on the interviews alone, why the other students who self-admitted their TBIs, and received help from their

professors, were not also introduced to staff from the university or college's disability office.

Subtopic 3: Online Self-Directed Course

Participant 4 was the only participant who described attending a self-directed course of instruction that fit the UDL model that was discussed as a potential benefit for TBI learners. The participant noted that he chose this model because of his learning challenges and, to date, this design model had been beneficial to him. He explained the close and continual contact that he had with his mentor weekly, where discussions occurred about academic performance and any personal and professional occurrences that could influence his studies. Table 20 captured the significant comments regarding self-directed study.

Table 20

Self-directed study

Data Source	P	Significant Quotes
Interview	P4	I go to (college name removed). The school has a mentor program and it has two layers. You have a student mentor who is kind of like your resident advisor throughout your entire degree program so, for the 4-years of my bachelor's degree, I talked to one person every single week. He's a subject matter expert, he has a degree in my field, and has been through all the classes and has tips, tricks, and techniques for how to get through the course, and can answer generic questions. Plus, their goal is to help keep you on schedule. That's your student mentor. There is a course mentor who is there to get you through a specific course. Through all of my Bachelors, and my Master's, with the exception of the group assignment, I have had little to no course instructor interface. I go in, when I first start a course I sign in. There is a pre-test to let you know kind of where you are with the current course material. You sign in, you take that test, if you know what you're doing, you study the areas that you don't, and you take the final and you're done with it. So, it's about documented competency versus preset study things, like, can this person do this kind of job. It's a very different online model than most of the online universities. Most of them have the, get your assignments on Sunday, you do your assignment on Friday, comment on two other people's discussions. Like (named other college examples). This college model is different than anyone else. There is no group forum, no group posts, and no instructor interactions. You get your materials, you study it, you pass it, you move on. My student mentors, during the introductive period, we talk every week or every other week through the entire time I'm a student. Through that time, you get to know each other, we talk about different issues, you know – my instructor knows that I moved and that I wasn't going to make any progress for several weeks, they understand my learning things, they understand my job, we talk about my travel, we talk about my work. So, they are very familiar with who I am as a person and that actually came to my benefit when, as a group, all the communications failed. And, they were like, we need a characterization of your conversations with (name removed), and they said, "He's been nothing but respectful, he's very straightforward and to the point. He's very professional in his communications…' So, we don't talk about war stories, but they understand that I do have some limitations. But they are student mentors, not course mentors. But, because of the way the stuff is presented, they help me with things like, "think about things like this…", and they also act as a pretty good sounding board.

Summary

Concerning self-directed learning, P4 indicated that this was the only method that

worked for his learning preferences. He did not engage with other students for discussions, and only had one course in the past where a group project was required; the participant did not have a positive experience with the group project. This model had structured assignments with due dates, and he received weekly contact, motivation, and feedback from his mentor. The course design minimized his TBI challenges, maximized his mitigation strategies, and afforded him the greatest opportunity for effective learning.

Summary

To summarize the lived experiences of the TBI veteran learners in online universities and colleges, each of the participants reported challenges with retaining new information and transitioning new information from short term to long term memory. This facet was closely intertwined with the mitigating methods that the participants learned and discovered on their own, to work through their learning challenges. They perceived their educational experiences as challenging, often frustrating, and always overly time-consuming, but despite all this - rewarding. The variances of experiences between the six participants on the topic of ADA services was compelling. In chapter 5, I provided the findings of this study, discussed the limitations I experienced, suggested recommendations for future research, and offered implications of the findings.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

U.S. military members continue to engage and be exposed to warfare and numerous veterans are returning with TBI (NASEM, 2019). While many still served with this injury, others have completed their service and transitioned to the civilian sector. Whether they remained on active duty, reserve, or transitioned out of service, they took advantage of the educational programs that were offered because of their time in service. Their TBIs altered cognitive abilities, memory, behavior, and emotions, all of which varied in intensity and affected learning.

The purpose of this phenomenological study was to gain additional insight from the perspective of the TBI veteran student on their unique and individual learning challenges experienced in online classrooms when suffering from TBI. The conceptual framework for this study was based on theories from Bandura (1986), Zimmerman (1995a), and Schlossberg (1981). Bandura's (1986) theory of self-efficacy was used to help define how TBI veteran learners perceived their online educational abilities; Zimmerman's (1995a) theories were relevant in attempting to define, describe and assess the relationship between TBI and learning; and Schlossberg's (1981) transition theory was chosen to help define the self-perception of the TBI veteran learner's transition from service to that of a student with this injury.

The research questions explored the lived experiences of TBI veteran learners who participated in online college or university courses, their perceptions of their

learning experiences and the use of technology in the classrooms. The themes resulting from this study were derived from the interviews and journal responses, and the number of times the issues were discussed, addressed or mentioned during the participant's collective experiences. The three primary themes identified were (a) the physical, emotional, and cognitive changes that these participants experienced as a result of the TBI, (b) the ways that these participants mitigated these changes in their online courses, and (c) the interactions that they described within the classroom.

Interpretation of the Findings

The first theme for this study was the participants' physical, emotional, and cognitive changes they experienced in their online courses. Bandura (1986), in the theory of self-efficacy, theorized that when someone felt that their actions impacted situations or events, they felt as if they had control, they possessed feelings of self-worth, and were able to recognize these differences in themselves. In essence, self-efficacy involved a person's individual beliefs about their abilities and internal motivation, whether or not these beliefs were objectively true. TBI injuries, which altered behavioral and emotional traits in ways that were unique for each individual, also altered internal motivation and feelings of self-worth, as this study has supported.

The interviews and journal responses, collectively, indicated that the participants had a sense of self-worth. However, when the symptoms impacted their learning, with over half indicating that they struggled to the point that they felt they needed to self-admit their disability to their instructor for fear of failing, that sense of control and self-worth faltered. They recognized that they did not have control over the symptoms of their

TBI, or how those symptoms affected their learning, and they inevitably doubted their own self-worth. There are a few periphery considerations that may have influenced their decision to seek assistance.

The participants described the ways that their online instructors supported them during their online courses. P2, for instance, was failing and described her anguish over this change in her learning abilities since her TBI. She had an open dialog with one of her professors about her injuries and luckily, for her, her professor was well-versed on the injury and the impact on learning. Her professor directed her to the disability services office, and P2 received the assistance she needed. P3 described similar feelings over his inability to keep up with his online course work and described the mental and emotional turmoil it caused. Realizing he was going to fail, he self-admitted to his professor(s), and while his professor(s) did not guide him to ADA services, they provided him with additional instruction and additional time to complete his assignments.

There was an acknowledgment by the participants that they had limited and, in some cases, no control over the effects of the injuries on their learning abilities. But this acknowledgment only occurred, for the majority of the participants, after they reached a point of near failure in their learning pursuits. Most were motivated to self-admit their disability because failing the course(s) would require them to repay the tuition assistance that they received from the military or through the VA. These factors played a role in the participants' self-efficacy, as they struggled to effectively re-learn how to learn. These processes intertwine closely with self-regulated learning, and the trial and error used to

determine which methods worked best to facilitate the participants' new learning techniques.

Coping mechanisms and skills were used by each participant to overcome their learning challenges. The study by Scheenen et al. (2017), showed the relationship between coping styles and self-efficacy following mild TBI. The results indicated that the participants who had increased self-efficacy had active coping styles, and those who possessed decreased feeling of self-efficacy had avoidant and passive coping styles. Low self-efficacy equated to weak commitment to goals.

The participants in my study, despite having momentary periods of low self-efficacy and lack of faith in their abilities to overcome the learning challenges associated with their TBIs, recovered both and reported success with meeting their academic goals, albeit experiencing delays with their programs. The delays were due, primarily, to the processes necessary for their learning mitigation techniques. The catalyst to their success, ultimately, were the interactions they had with their professors after self-admitting their TBIs. This is a multifaceted construct and takes into consideration the motivational effects instilled by their professors during their added one-on-one discussions, in addition to the extra tutelage and time afforded for completion of their assignments. This segues into the next study for consideration.

Williams (2017) explored the topic of TBI injuries and online learning from the teacher's perspective. The TBI veteran learners in that study agreed that online learning was convenient, but it did not assist with motivation and their self-directed learning. Lastly, the participants agreed that the online learning environment needed to be changed

to support the TBI veteran learner. Williams (2017) confirmed that TBI veteran learners had extremely specific needs in online learning environments and not meeting those needs caused self-directed learning to suffer greatly.

Williams' (2017) statement regarding motivation and self-directed learning was significant and was supported by the results of my study. Each of my participants, who self-admitted their TBI and received additional support from their respective professors, gained a secondary influential benefit from the extra one-on-one contact. The phone calls, video calls, and texts, in addition to providing the educational lessons, also added a motivation and confidence boost. P2 discussed the level of effort her professors made to assist her, with phone call reminders, welfare checks to see how she was doing, in addition to the tutelage. The combination of these efforts, made by all the professors, helped to support and even enhance self-directed learning for these TBI learners.

Self-directed learning in an online forum is possible and plausible for the TBI student however, these students, as discussed, require additional support in the form of motivation, extra instruction, and extra time. The participants in this study acknowledged a definitive and positive difference in their learning abilities once these steps were offered and applied. Self-efficacy was apparent for the participants, although it waxed and waned at times. Other motivational factors, including personal, professional, and financial, played a role in driving, and some instances sustaining, their self-efficacy.

The second theme that resulted from this study was the methods that these students developed and used to mitigate their changed learning processes because of their TBIs. Schlossberg (1981) indicated that successful adaptation to a transition can be influenced

by the characteristics of the transition, itself, the characteristics of the pre- and post-transition, and the characteristics of the person experiencing the transition. Multiple factors can negatively or positively influence each stage of the transition. For this study, the focus was the adaptation from military to that of a veteran student. This study however, added another dimension to the theory of transition. For these participants, the transition included the transition of pre-TBI learning to post-TBI learning. And for each of the participants, that transition was a difficult and noticeable one. The participants expressed internal and external motivators that affected their adaptations, both negatively and positively.

The participants compared their pre-TBI learning skills during their interviews and journal responses and noted their frustrations at the changes that occurred post-TBI. Despite the frustrations and the acknowledged and noted differences in learning, each participant experienced a transition pre- and post-TBI. They discovered methods for the adaptations, with a mix of negative and positive influences, which were unique to the participants 'experiences. Schlossberg (1981) also discussed how the transition merges with a person's individual state and situation at the time. This theory proved relevant to the study, as each participant's adaption can be viewed as possessing, or self-discovering, the resources to allow the necessary changes.

Hembrough et al. (2018) case study on veterans' preferences of attending courses online or on-campus discovered that veterans with TBI and/or PTSD preferred the traditional university and college courses over online learning. However, the results from my study were in opposition to this. In the Hembrough et al. study, one of the primary

reasons the participants opted for campus learning was the connection they had with their peers and their teachers. I noted that online education required a great deal of self-motivation and time management, and these factors can be dramatically influenced by TBI injuries.

My study also supported that the TBI veteran students struggled with self-motivation and time management. Despite the challenges and, again, after receiving additional assistance, each opted for online learning over campus learning primarily because of the flexibility. Since material had to be read, written, viewed, and listened to repeatedly in order to absorb it, a typical brick and mortar classroom setting, as perceived by the participants, was not be conducive, or comfortable, for learning. P2, for instance, said that if she were in a classroom, she would have to raise her hand with questions constantly – which would be disruptive and embarrassing. But with online learning, she felt no hesitancy with texting or emailing her professors for clarity or assistance on issues.

The other participants discussed the importance of flexibility because of their TBI symptoms, residual symptoms, and the various mitigation strategies they had developed and were time consuming. Lastly, there were positive comments on the self-directed UDL style of learning, which was completely removed from interactions with other students. Perhaps, the contradictions noted between the studies further supported the individualistic nature of this disability.

TBI veteran learners often experienced comingled physical and mental disabilities, as described by numerous research studies (Seal et al., 2016), which altered

the way they processed and engaged in the learning processes. This speaks to the adaptions that were made, based on their internal and external influences. My study supported that the issues of physical, emotional, mental, and cognitive were closely intertwined. Each participant, using self-discovery, identified how these various aspects altered their learning. After identifying them, they chose to adapt and re-learn how to learn by devising their own learning processes.

These TBI veteran learners went through a process of transition in their own individual learning processes. They discovered and noted differences in their pre- and post-TBI learning abilities. As part of their self-discovery, they began to identify how these physical, mental, emotional, and cognitive differences changed their learning processes. They were influenced internally and externally, by various motivators which, in turn, helped them to adapt to their new normal.

The third theme that resulted from this study was how the participants interacted in their online courses in response to their TBI learning characteristics. Zimmerman (1995a) noted that there had been little research and study on the topic of self-regulated learning, although it has been more central to the academic community with the advent of online learning. The self-regulated learner becomes the leader in and master of their own learning abilities, and they are proactive in seeking new knowledge and diligent to overcome challenges in their own learning regimen. Zimmerman's theories on self-regulated learning were relevant to this study and were supported by the experiences of each participant as they described their processes of re-learning how to learn, post-TBI.

I have pointed out, previously, that each participant discovered their mitigative learning techniques through trial and error processes and did so without any form of professional guidance. I find this to be a significant discovery and one that fully supports Zimmerman's self-regulated learning theory. They were the masters of their learning abilities, despite their post-TBI learning challenges. Each of them was aware of what techniques assisted them with learning, aside from more time, before self-admitting their disability to their professors.

I mention this because this is a key factor for future consideration when developing assistance programs for the TBI adult learner. As this study has demonstrated, the participants worked through which learning methods best helped them, the times that best-facilitated learning, the amount of data they could process at a time, and all the other nuances that were unique to their disability and their learning. They were self-aware and articulate and knew specifically how they learned. A "cookie-cutter disability program", as noted by P5, simply was not helpful.

Zimmerman's (1995a) aspect of self-regulated learning, which included the cyclic process of a learning feedback loop to enhance the learning experience, was noted by the participants as they had to discover new methods to learn with their TBIs. Zimmerman (1995a) noted that a student was required to recognize the need to alter learning strategies, possess interdependence to act on that need, and be able to evaluate their own learning effectiveness. The participants described periods of self-discovery after their TBIs. They recognized and acknowledged changes concerning their cognitive abilities, and learned, on their own, techniques that assisted them with studying and learning material. In

addition to Zimmerman's theory, there may be influences that differ based on the military population, the military mindset, and the typical perseverance that most military members possess.

For instance, they each discovered that their ability to retain new information was lost, unless they repeatedly wrote it down, took audio notes rather than written notes, learned it in small chunks, or learned it during short durations. This discovery was obtained through a series of trial and error. Each participant, after discovering that material was not retained by reading alone, tried audio and, if that did not work, they tried video, and this process was continued until a technique was successful.

While some of the participants shared many of the same mitigating techniques, others were unique and were based on the severity of their TBI and its residuals. But each participant experienced the process of applying a technique, assessing its effectiveness, and adjusting their strategies when the results were not satisfactory. The participants made use of the feedback loop Zimmerman (1995a) described as part of his self-regulated learning theory, and they did so internally, and without external prompting.

Boyraz et al. (2015) studied the correlation between the varying degrees of PTSD symptoms and how the symptoms affected self-regulated learning, and the longitudinal study discovered that students who reported high levels of PTSD symptoms also had lower levels of effort regulations, which impacted second-year enrollment due to first-year GPA scores. My study supported the intertwined mental and cognitive disabilities that occur with TBI and while not all participants specifically mentioned PTSD, other mental health disabilities such as anxiety and depression were noted. Additionally, the

participants agreed that their specific mental health disabilities altered their motivation and self-regulated learning abilities.

A study by Hendricks et al. (2015) researched university and college students participating in Project Career, a program designed to support TBI veteran learners through the integration of CST. These programs included specific applications and mobile devices, and they discovered that TBI veteran learners who noticed an increase in productive learning strategies and more positive attitudes were also more independent and reported improved experiences with technology. This study used technologies specifically designed for cognitive support however, this posed the question of how TBI students engaged with technology, in general.

The issue of engagement with technology was posed to the participants in my study, and there were mixed thoughts and feelings. One participant noted that, other than the virtual classroom workspace, additional technologies and applications were often frustrating because they either did not have proper instructions for use or required even more time to grasp. Another participant discussed his dislike of interactive course books that required separate logins on alternate sites to complete assignments or tests. The participant explained that the use of these interactive course books added frustration, especially when taking more than once class that had this type of instructional method, particularly when they each required their own logins. The technologies added more time, confusion, frustration, and more processes to his learning routine. Lastly, it was noted that some of the applications offered do not always work on the different platforms used by the students (iPad, iPhone, tablets, etc.).

Frost and Connolly (2018) discussed the possibilities of using UDL for students who were recovering from a concussive injury. The course design that can creatively implement multiple teaching methods (verbal, audio, video, and mixed) can reduce multitasking activities. If used effectively, combined teaching methods can break lessons, tasks, and tests to smaller sections, and shorter durations, each of which promote learning for the TBI veteran. This model of learning required continual monitoring, which was not typically available in university and college environments.

However, during this study, I was fortunate enough to have a participant who described being enrolled in a program that was designed under the UDL model. Concussed students often required ongoing support that included prompts and reminders, and detailed feedback both orally and in writing (Frost & Connolly, 2018). P4 described his experiences with this course design, and his weekly engagements with his student mentor. His student mentor was aware of his disability, all events that occurred with his life and work, and how these events affected his educational goals. Additionally, P4 had a course mentor whom he conferred with for his degree plan. This one-on-one weekly interaction with his student mentor provided continual monitoring, motivation, and support.

Evmenova (2018) in support of UDL for TBI students indicated that these processes included the use of multiple ways to motivate students, the use of different learning methods to present the content and allowed students the means to demonstrate proficiency in different ways. Part and parcel to this type of learning was the benefit of the teacher's (or mentor's) constant contact with the student and real time assessment of

their needs. This allowed for proactive, rather than reactive, adjustments to assignments or degree plans, as many life issues could be forecasted and built into the plan (i.e., travel for work, moving, etc.). Lastly, since close communication and flexibility were part of the design, any unexpected life issues could also be more easily managed.

Gritful-Freixent, et al. (2017) agreed that UDL can be beneficial to students with learning disabilities but only if the students are able to articulate their learning needs. While most adult learners are articulate, they may not know how to express the types of methods they require to overcome their learning challenges. This typically must be assessed by the teacher, mentor, or counselor. Students must self-identify their disability, provide the required documentation of their disability, request for specific accommodations, and then wait for any adjustments to be made.

The process relied on the student to describe their challenges and what they need to learn. Of note, the Gritful-Freixent et al. (2017) study did not address TBI, specifically, or military members. Baring these two aspects, my study indicated that each participant was well-versed on their own learning needs, what did and did not work for them, and the processes they had to use to effectively learn new material. The issues of self-discovery, identification and expression may have an underlying association with the military population as a result of their operational and technical training.

Summary

Self-regulated learning was a predominate factor for learning adaptations, mitigations post-TBI, and in the online learning forums. Recognizing that there were learning differences as a result of their injuries, these participants worked through the

often-frustrating processes of trouble-shooting their new learning needs. They were not coached, instructed, or guided by any trained professions but, rather, were motivated and driven by their own intrinsic goals and ideals. Research noted the effects of PTSD on self-regulation and learning, and this was an important consideration when crafting any type of assistance for these students. As one participant noted, her depression would cause her to completely shut down to a level where she would find it difficult to do anything but basic life sustaining actions. These comorbid mental health conditions can and do cause momentary lapses in the continuity of their self-regulated learning. Once again, the theme of requiring more time to complete assignments and programs was strengthened by these interconnected issues.

The UDL design seemed promising for TBI learners, and as one participant noted, was specifically chosen based on his post-TBI learning preferences. The design provided a constant communication loop and enabled forecasting, and changes and alterations in real time rather than as a reactionary measure. There was a noted parallel in the claimed success between the close communication mentioned in the UDL design, and the type of guidance provided by the professors after the participants self-admitted their disabilities. Both shared a style of mentorship, coaching, and motivational guidance, in addition to the tutelage, and this combination of techniques may be the reason for the success between the two issues.

Limitations of the Study

The limitations of this study included time constraints, small study, lack of funding, no medical diagnosis of TBI since the participants self-admitted their

disabilities, and the possible mental anguish and embarrassment for the participants. The only time constraints experienced during the study were in the recruitment phase, and during the scheduling of interviews because of the various travel schedules of the participants.

Regarding the sample size, there appeared to be reluctance to respond to the recruitment flyers. After an adjustment to the recruitment process was made, and with IRB approval, only six participants volunteered. Despite not gaining eight to ten participants, as initially designed, I gathered a full perspective of the impact of TBI in online learning forums from the participants who volunteered.

There was no funding for this study, due to the nature of its use for dissertation purposes. The participants self-admitted their TBI injuries, and no medical documentation or formal doctor's diagnosis was required to verify the disability. As there can also be physical and mental trauma associated with the injuries, discussing TBI may cause emotional stress for the participants, and I was sensitive to this. None of the participants expressed any duress over discussing these issues, and as a follow up, they were reminded that the Veteran's Crisis Line number was on their informed consent form, at the conclusion of each interview.

Recommendations

This study focused on military veterans. The participants in this study happened to each have more than one reenlistment term meaning, they were/are either career military or planning to be, when the injury(ies) occurred. The military instills pride and a warrior ethos, through training, operations, and the organization itself, that is not always

conducive to admitting shortfalls, injuries, or failure. This aspect may be explored in future studies, using the resiliency theory, as a lens to explore differences between military and civilian TBI students in online and/or in campus classrooms.

Interestingly and of note, after self-admitting their TBI to their instructors, only one participant was offered ADA services, or told of other disability services that may have been offered by their respective colleges. There may be several reasons for this, but this study did not provide the data necessary to formulate the possibilities with any degree of certainty. Considering the number of TBI injuries reported by the military and the civilian sector currently, and the availability, flexibility and affordability of online learning, this topic may be worthy of further study.

Lastly, and regarding TBI assessments and program applications, the statements made by one participant in this study were compelling. While continuity in program processes are important, a one-size-fits-all approach to applying those processes may not be beneficial to the TBI student, as learning needs are extremely specific and unique. A future study to research the effectiveness of university and college TBI assessments and program applications may be of benefit to military and non-military TBI learners.

Implications

TBI veteran learners are capable, willing, and able to be productive and eager online learners, but many require additional assistance to do so. At the individual level (the learner), this study has the potential to positively influence educators, administrators and policy makers who are in positions to create programs to better represent and assist the TBI veteran learner, and TBI learners, as a whole. For many TBI veteran learners,

who may or may not be able to remain in service, adult education is the steppingstone to assist with transition to the civilian sector of employment.

If these learners can successfully assimilate, absorb, and retain the material required to pass classes, and obtain the degrees needed for employment, they add a vast amount of wisdom, experience, and leadership to society. With the various social media platforms, they can become role models for other TBI veteran learners, and TBI non-military learners. For example, there are countless military forums throughout Facebook, Linked-In, and the like, and successful accounts of educational experiences can be motivators for other potential TBI learners. The drive and motivation to pursue an education despite a TBI injury, and knowing that others were able to do it, can be contagious.

At the organizational level, this study provided a specific focus for academic organizations, disability programs administrators, and policy makers to use in the development of programs and policies to assist the TBI learner. The results of the study showed how vastly different and unique each TBI injury was to each participant. The results also displayed the wide variances of symptoms, how the symptoms affected learning, and the individual mitigations each participant employed in order to learn. TBIs are the silent and often invisible injury. But, the symptoms and the effects on day to day life, and in the process of learning new material, do not need to remain hidden or stigmatized.

The professors noted by each of the participants did an amazing job of coaching, mentoring, and assisting, after the TBIs were self-admitted. From the accounts of the

participants who self-admitted, only one of the professors acknowledged having had any training or background on assisting TBI students with learning challenges. The concept that nearly all of the participants were not aware, and not made aware, of disability services was not one I expected at the onset of this study.

Given that this occurred for most of the participants may indicate a gap somewhere in the disability processes for the various schools they attended. Policy development, in the form of TBI training and assessment programs for professors in tandem with the ability of the TBI learner to know and have access to school sponsored disability assistance, will have a significant impact on future TBI veteran online learners, and TBI learners, in general.

A phenomenological approach was chosen for this study to collect the detailed, rich experiences of the participants on the topic of their TBI, and online learning. The participants were enrolled at different colleges and universities, as this was not a consideration for the study. A future study might be beneficial to explore the TBI veteran learner's experiences with online classes using a case study and directing recruitment from only one school or comparing and contrasting differences between schools. Finally, and with the noted descriptions of the one-on-one assistance given to the participants by their professors, a study focusing on secondary education professors in online classes, and their experiences with TBI veteran learners, may benefit from being explored through a phenomenological lens.

Conclusion

This study supported that the participants' self-efficacy was applied towards re-learning how to learn and identified new processes and methods best suited to overcome their cognitive, physical, emotional, and mental obstacles. Their own self-discovery, willpower, internal motivations, and drive pushed them forward, and they each continued their educational goals despite the challenges. Their accounts helped to support that learning with a TBI is not impossible however, it must be noted that these participants are/were military members who possessed a certain mindset and ethos that was possibly influenced by their years of training in service.

Colleges and universities typically identify their military veterans, and this is particularly true if the veterans are using some form of military or Veteran's Administration financial assistance. However, identifying non-military TBI students may be more challenging. As discussed previously, there are a large number of reported and non-reported TBI injuries amongst military veterans. In conjunction with this, many also took advantage of the educational benefits as a result of their time in service and attended online colleges or universities because of the flexibility online courses provided. Based on the reported numbers of TBI veterans, colleges and universities would benefit from a more proactive disability service office that coordinated closely with the enrollment office. The goal would be to identify these online veteran students and present them with disability service information.

Non-military TBI students may also be reluctant to not only acknowledge their TBIs, but may not view it as a disability, as this study suggests. Schools, and students,

would benefit from more pro-active announcements about the types of assistance that can be offered and provided for TBI. This can be in the form of a posted announcement, an email, or part of each professors' welcome message at the start of online classes. In tandem, professors should also be well-versed on what their respective college or university offers, in the form of disability assistance for TBI, and other disabilities, as well. Of note, all considerations for maintaining Health Insurance Portability and Accountability Act (HIPAA) protections should be observed. Optimally, and without violating students' privacy, every student should be made aware of the types of accommodations that the disability service office can provide for online learners.

While this study indicated that each professor diligently supported and assisted the participants, upon self-reporting their TBIs, only one participant was directed to the school's disability office for further help. This is concerning a few reasons. Without being directed to the school's disability office, the student cannot receive consistent assistance throughout his or her program.

There are programs, applications, and various learning tools, as one participant noted, that are provided through ADA services. However, these services typically require a referral, following an assessment from the disability office. If the student skips the school's disability office, opting only to self-admit to his or her professor, the student will have to do so for each class, and hope that each professor will provide the needed support. And lastly, because the student is working independently with multiple professors to address his or her learning needs, the process lacks continuity, or a means of feedback for process improvement.

When programs are being developed for this disability, I believe it is important to dedicate a large portion of the assessment towards the experiences of the learner. This study revealed that every participant was self-aware, understood their own disabilities, how they affected their learning, and what mitigation strategies were most beneficial for them. As one participant noted, after having experienced three different disability offices, a detailed, thorough, and individualized assessment was central to creating an effective learning environment. The different types and severity of residuals from the TBI injuries also altered learning processes to varying degrees. Each participant, through experimentation and trial and error, developed individualized learning methods that substantiated that a one-size-fits-all approach was simply not beneficial to the TBI learner. Only one feature, across all participants, remained consistent throughout the themes – learning with TBI requires more time.

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Appendix A: Initial Interview Guide

My initial interview questions are below:

1. Can you describe your symptoms of your TBI?
2. Can you describe how the symptoms impacted your academic abilities?
    a. Prompting questions:
    b. Can you describe your ability to concentrate on learning material?
3. Can you describe your motivation with attending class and completing assignments?
4. Can you describe your mood when learning new material?
5. Can you describe your ability to use time management during your online course?
6. Can you describe your experiences with online course instructions?
    a. Prompting questions:
    b. What were your experiences with various learning methods?
    c. audio lessons; video lessons; text lesson; programs or applications used by the school; combined methods
    d. Can you describe how each learning method assisted you, or hindered you?
7. Can you describe your online interactions with other students?
    a. Prompting questions:
    b. Can you describe your feelings about your contributions to discussion posts?

    c. Can you describe your feelings and thoughts about your contributions to group assignments?

8. Can you describe your feelings and thoughts about your interactions with your online instructor(s)?
    a. Prompting questions:
    b. Can you describe any instances when they may have assisted you in your learning endeavors?
    c. Can you describe any instances when they may not have assisted you in your learning endeavors?
9. Can you describe whether they knew about your TBI injury and if so, their engagements with you afterward?
10. Can you describe your experiences with the various forms of assistance offered by the university and college disability office?
    a. Prompting questions:
    b. Can you describe your experiences with seeking assistance?
    c. Can you describe the type of assistance you received?
    d. Can you describe your thoughts and feelings about this assistance?
    e. Can you describe how the assistance benefited you?
    f. If it did not help, can you describe why?
    g. Can you describe your thoughts and feelings after reaching this conclusion?
11. If you did not seek assistance, can you explain why?

Appendix B: Follow-up Interview Guide

This follow up interview will allow you the opportunity to review your transcribed Initial Interview, ask additional questions, and/or add to your interview.

1. After reviewing your transcribed interview, is there anything else you wish to add?
2. Is there anything you wish to clarify from your initial interview?
3. Do you have any additional questions?

Appendix C: Journal Questions:

1. After your TBI, could you describe how you felt about your ability to succeed in your online university and college course?
2. Can you describe any instances, assignments, or learning challenges that altered your internal beliefs about succeeding?
3. Can you describe any challenges with your self-regulated learning after your TBI?
4. Can you describe any changes in your adaptability after your TBI?
5. Can you describe the comparison in your learning abilities pre and post TBI?