THE LIVED EXPERIENCES OF STUDENTS AND FACULTY IN HIGH SCHOOL AND COLLEGE FOLLOWING A NATURAL DISASTER:
A PHENOMENOLOGICAL STUDY

by
Cyrenna L. Moreno
Liberty University

A Dissertation Presented in Partial Fulfillment
Of the Requirements for the Degree
Doctor of Education

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APPROVED BY:

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ABSTRACT

The purpose of this transcendental phenomenological study was to determine the characteristics of students in higher education who persisted in their studies following the Hurricanes Irma and Maria in Puerto Rico in September 2017. The central research question for this study was: "what are educators’ and students’ perceptions of the characteristics necessary to persist in a difficult environment following a natural disaster?" The theories guiding this study were Maslow’s hierarchy of needs and Hobfoll’s conservation of resources theory. This study was conducted as a transcendental phenomenological study utilizing a sample that contained five educators and eight students who attended high schools in Puerto Rico during two hurricanes. The participants must have been a part of the educational system for at least three years prior to Hurricane Maria. The setting was Terra Bonita, a city in Puerto Rico that sustained major infrastructural damage during the hurricanes. Many parts of the city were without power for over a year following the hurricanes. The data collection process involved the following three methods: timelines prepared by the students and faculty participants, semi-structured interviews with the student participants, and a focus group with the faculty participants. The data was analyzed utilizing Braun and Clarke’s thematic analysis. The study yielded four themes and eight sub-themes during data analysis. The themes were socialization, continuing education, desire to stay in Puerto Rico, and barriers to leaving. The sub-themes were concern for one another, the need for normalcy, schools pre and post hurricanes, future career plans, value of education, characteristics of persistent students, their home, and sense of community.

Keywords: natural disaster, persistence, infrastructure, and transcendental phenomenological study
Dedication

First, I would like to dedicate this dissertation to my children, who I pray will understand the value of education and will far surpass my education. My family has sacrificed many outings with me in order for me to complete this process. I appreciate all of their patience and support through this. I would also like to recognize my husband, John for this amazing accomplishment. He has encouraged me every day to obtain this goal. I could not have done this without his love and support.

Second, I would like to dedicate this to the educators of Puerto Rico. They inspired me in an unimaginable way to become the best teacher that I can be. Their love for their island and their students was obvious in our interactions. Their ability as educators was showcased by the fact that students were drawn to attend school and complete their studies.

Last, I would like to dedicate this to all of the students of the world. I believe that education is the key to a better life, and I pray that they find teachers that will inspire them to do the amazing things that they are capable of doing. The students of Puerto Rico understood this, and their fight to obtain their education was incredibly inspiring to me.
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I would like to begin by acknowledging, Dr. Quindag’s efforts in seeing me through this painful process. She allowed me to sit at her kitchen table and cry when things seemed hopeless, and then she assisted me in finding a reasonable plan to complete this task. I am so grateful to have her in my life. I would also like to thank Dr. Yocum, who has responded quickly and thoroughly to me during this process. I was very lucky to have the two of them on my committee.

I would like to thank my gatekeeper, Aideliz. Without your assistance, I would never have found such wonderful and encouraging participants. Also, I would like to thank all of my participants for sharing their stories with me. They were happy to share their struggles and their successes, and they have forever changed my life.

I would like to recognize the support of my family. My mother, who raced us to the finish line for our bachelors’ degrees, has always encouraged me to pursue education. She was the first one to teach me how important education is to an individual. My children and husband have sacrificed so much for this process, and I cannot thank them enough for their support and encouragement. I also want to thank God for getting me through this process in one piece.

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List of Abbreviations

Federal Emergency Management Agency (FEMA)
Desert Locust Information Service (DLIS)
Annual Status of Education Report (ASER)
Diagnostic Interview Schedule for Children (DISC-IV)
Institutional Review Board (IRB)
Post-Traumatic Stress Disorder (PTSD)
CHAPTER ONE: INTRODUCTION

Overview

Education takes persistence from students and teachers. While it may be easy for students to persist when attending classes and working through assignments many days, what happens when the infrastructure at home and at school is severely damaged? When Hurricane Maria struck the island of Puerto Rico, it took over eight months to restore power to the majority of the area (Llorens, 2018). Despite this, the educational sector continued to offer classes to students, and students continued to attend. This phenomenological study explored the students’ and educators’ perception of the characteristics that enabled students to continue to persist in their education during this difficult time. Chapter one contains the background, situation to self, problem statement, purpose statement, significance of the study, research questions, definitions, and summary.

Background

Attendance is a major issue with schools (Sund & Bignoux, 2018). Unfortunately, students can find any excuse not to come to class. Lower attendance yields lower grades and a higher chance of students not completing their programs of study (Sund & Bignoux, 2018). Schools and universities often examine ways to increase attendance and persistence of students. In Puerto Rico following the Hurricanes Maria and Irma in September 2017, some students refused to use excuses to miss classes. These excuses ranged from a death in the family, roads being blocked, and having no water or power at home. Despite these possible excuses, students continued to attend classes and worked towards the completion of their programs. This research study explored the characteristics of those students. The findings should be of interest to high
schools and colleges looking to improve their attendance and graduation rates, particularly after a disruption.

**Historical Context**

Puerto Rico has a rich history that intersects with Spain and the United States. McBeath (2017) outlines the history of Puerto Rico from its discovery in 1493 by Cristian Columbus, to its settlement in 1508 by Spanish explorer, Ponce de Leon, who gave it the name Puerto Rico, which means “rich port.” The island natives were the Taino Indians, which were almost immediately enslaved by the Spanish in a system known as “repartimiento.” The Spaniards were eventually going to give freedom to these natives, but due to severe abuse of the system, Catholic friars on the island appealed to the Spanish Crown to reform (McBeath, 2017). Eventually, there were some reforms including their religious indoctrination to Catholicism; however in 1511 there was a revolt which resulted in 6,000 Tainos being shot to death resulting in the Taino Indians fleeing to the mountains or other islands (McBeath, 2017). Puerto Rico then became primarily an agricultural economy with little notice from the Spaniard however it remained a valuable colony (McBeath, 2017).

In 1898, the United States obtained Puerto Rico following the Spanish-American War as part of the Treaty of Paris which ended the war. Since then, the United States has had a presence in Puerto Rico (Hernandez, 2017). Roman (1997) argues that imperialism drove the United States to acquire Puerto Rico, which makes Puerto Rico a territory not a state, and he asserts that Puerto Rico’s proximity to the Panama Canal makes it militarily and economically valuable. Hernandez (2017) argues that Puerto Ricans were granted US citizenship in 1917 over 100 years ago, but were not given the right to vote or representation in the United States government. The citizens of Puerto Rico were somewhat discontent with the United States, and Hernandez (2017)
notes that the United States returned the official language in schools to Spanish in 1947, allowed for the first local election of a governor in 1948, and created the Commonwealth in 1952. Maldonado-Valentín (2016) discuss the educational policies regarding language in Puerto Rico. Between 1898 and 1949, the schools went back and forth using Spanish or English until 1949, when it was settled that Spanish would be the primary language and English would be a subject taught in school. During that time, Spanish and English as the primary language in schools was addressed seven times (Maldonado-Valentín, 2016). Del Moral (2019) describes a movement of single, White teachers that migrated from the United States to Puerto Rico to teach during this period when the language was not an issue. Eisenstein Ebsworth, Ebsworth, and Cai (2018) assert that speaking English is often rejected in Puerto Rico as a preservation method against United States domination, and the students are aware of the statistic that many successful Puerto Ricans do not speak English. This aversion to English has also hindered the Puerto Ricans in assimilating during their migration to the states following the hurricanes. Del Moral (2019) offers that language was not the only issue in Puerto Rican schools that was manipulated by the government, but the history of the island was also adjusted through a series of short stories written by Elizabeth Kneipple which supported the political vision of the United States.

The 1950s were a prosperous time for Puerto Rico. Méndez-Méndez (2019) described the transformation from an agrarian economy to an industrial economy in the 1950s due to tax credits that were created in the 1940s. This led to a strong economy until the 1990s where better tax havens and cheaper labor led to manufacturing plants leaving the island. Now over 20 years later, the economic state of the island has continued to decline.

Méndez-Méndez (2019) stated that in 2013 the unemployment rate was 14% and 40.6% of families lived below poverty level, and the government has borrowed so much money to offset
daily expenses that their credit rating is similar to junk bonds. Mismanagement of funds contributed to this greatly, Rawlins (2018) cited that Puerto Rico supports 78 municipalities with mayors and committees with starting salaries of legal advisors at $74,000, while Fuste (2017) reported that in 2009 the annual household income in Puerto Rico was only $18,627. Despite the islands rich natural resources available, the debt along with the low wages has made Puerto Rico a difficult place to continue residing, with this terrible situation resulting in over 10,000 Puerto Ricans abandoning their homeland each year.

Although Puerto Ricans are accustomed to hurricanes, when Hurricane Maria struck on September 20, 2017, it damaged an already precarious infrastructure due to Hurricane Maria, which had damaged many things just two weeks earlier (Kishore, Marqués, Mahmud, Kiang, Rodriguez, Fuller, & Buckee, 2018). Diaz (2017) stated that Hurricane Maria was the first Category 4 hurricane to hit Puerto Rico since 1932 and tormented the island for more than 30 hours with rain and varying wind speeds that maxed out at 155 miles per hour. Ficek (2018) described months without consistent electricity, clean water, and other infrastructure items. Kishore et al. (2018) argued that despite the official death count reported was just 64, the actual count totaled more than 4,000 people.

Social Context

When considering the social context of a group, one important aspect to identify is their religious makeup of a group and how much religion is a part of their daily lives. Partsch (2018) states that Puerto Rico’s religious institutions, namely the Catholic Church, had a close relationship with the government prior to the United States taking control in 1898. Reyes-Estrada, Varas-Díaz, Parker, Padilla, and Rodríguez-Madera (2018) described the religious climate in their study of nurses in Puerto Rico, which they found to be 56% Roman Catholic and
33% Protestant, emphasizing that most participants verbalized that religion was a daily part of their lives. Their religious associations could have an impact on their level of persistence, as the people believe they can rely on a higher power to get through difficulties.

Another context to consider, asserted by Hamama-Raz, Palgi, Leshem, Ben-Ezra, and Lavenda (2017), is that “emotional, cognitive, biological, and behavioral symptoms can follow in the aftermath of a traumatic incident,” and any loss of resources can cause psychological distress (p. 2). Their study also found that social support was an outstanding predictor for increased subjective well-being for participants. A school is an extremely social design, which offers social support to its members during a time of crisis. Pullen (2018) asserted that Federal Emergency Management Agency (FEMA) was also helpful in assisting medical workers in locating patients with severe issues. Diaz (2017) asserted that psychological help was also coordinated for the island due to the extreme trauma a devastation such as this would cause a population.

**Theoretical Context**

Theoretical concepts address many facets of this phenomenological study including needs fulfillment and issues arising from extremely stressful situations. Maslow’s hierarchy of needs (1943) asserts that individuals cannot move towards self-fulfillment or self-actualization without their lower-level needs being met first. In this instance though, students persisted with in striving towards self-actualization through education, despite having their lower-level needs being unmet.

Stress and the ability to persist in education are directly correlated in previous studies (Flinn, et al., 2016, Kluen et al., 2017, Johnson et al., 2014). The following theories contribute to the knowledge of stressors placed on individuals today. Hobfoll (1989) proposed a theory that resource loss was a significant contributor to stress. Phipps and Ozanne (2017) describe routines as taken-for-granted practices that help individuals feel secure. Giddens (1984) theorized that the
trust that the world is secure and predictable comes through the use of routines. Yet despite enduring a substantial amount of stress, the students of Puerto Rico continued to pursue their educational goals. The research from these theorists all contends that an event like Hurricane Maria, which wipes out infrastructure, disrupts routines, and creates major barriers for individuals to meet their basic needs, would have serious consequences to a student’s educational studies. Students that were able to persist are clear examples of the opposite of these theorists’ claims.

**Situation to Self**

My interest in this topic stems from my children’s Puerto Rican heritage. My mother-in-law is from Puerto Rico, so my children often refer to that portion of their heritage before any other. Also, as a Future Business Leaders of America advisor, I have taken a special interest in the students from Puerto Rico during our national conferences. The students are an energetic group that are very proud of their heritage, so they are very easy to notice. The students impress me year after year, with their enthusiasm for business and leadership. After the events of Hurricane Maria, I watched on the news how time seemed to stand still for the island during their recovery efforts. My experience as a hurricane survivor taught me that within weeks life can return to normal after a devastating storm. In Puerto Rico, this was not the case. Months passed without power being restored to the majority of the area. Months later, I read an article by Ficek (2018) where she described her life after Hurricane Maria to “living as zombies,” just trying to get through each day with enough water and food to survive. Unfortunately, this lifestyle did not just last for a few weeks, but months. Consequently, I considered what was happening with the educational system in Puerto Rico. How were the students keeping up with their studies, and staying on track to graduate and possibly attend college over the next year? I thought about the
phenomenon of summer slide which Demir-Lira and Levine (2016) describe as the decrease in educational retention during the summer months, when children no longer receive “richer, structured instruction” that they receive during the school year (p. 596). If a period of two months out of school warrants a phenomenon related to loss of educational progress, what potential loss is there when students are unable to attend school for a prolonged period and their basic physiological needs are also not being met? As an educator, this concerned me as I considered the possible long-term ramifications of the situation.

My philosophical assumption of ontology is that reality is not set but can be seen from many perspectives (Creswell & Poth, 2018). The reality that I live with comes from my perspective as an individual that has always inhabited a first world country. The loss of modern conveniences for a time would be very hard for me to manage as an individual, but I understand that many people learn to do without due to necessity. The participants in this study have a reality that needs to be understood. My philosophical assumption of epistemology is that knowledge is evolving. My knowledge could expand by understanding the lived experiences of the study participants. The best way for this to occur is by having first-hand accounts described. My philosophical assumption of axiology is that the values people prioritize are best reflected during periods of suffering. The people of Puerto Rico were able to reprioritize that which they valued the most: education. The paradigm that I will employ is social constructivism. Social constructivism relates to knowledge being gained through interaction with others and understanding the complexity of the issues and not narrowing it down to only my view but the views of the participants of the study (Creswell & Poth, 2018).
Problem Statement

The problem was that there had been a contradiction in how the Puerto Ricans responded to education during the period following the hurricanes which goes against both Maslow and Hobfoll’s theories. The theorists both argued that lack of basic needs would trigger stress and hinder individuals from seeking to improve themselves (Maslow, 1943; Hobfoll, 1989). The participants in this study continued to attend classes during this period of time, despite the numerous challenges they faced. The benefit of this study is to better understand the characteristics of the individuals that were able to persist despite the Maslow’s and Hobfoll’s theories. By giving these students and teachers a voice to describe their lived experience after the hurricanes, I can identify the characteristics that they possess and learn from their experiences in order to continue the process of education for students following future disasters.

One common factor that is present during and after a natural disaster is stress, which can affect students in many ways. Kluen, Nixon, Agorastos, Wiedemann, and Schwabe (2017) found that stress impaired a learner’s ability to utilize pre-existing schema in acquiring new information; this pre-existing schema helps a learner by comparing a learned process with a new process. Johnson, Wasserman, Yildirim, and Yonai (2014) discovered that stress related to the campus environment effected the persistence level of college students regardless of race. In all the previous research, stress hindered the educational process and hindered the possibility for students to persist in their educational endeavors.

A significant theory present in many studies is Maslow’s (1943) hierarchy of needs, which asserts that individuals cannot move towards self-fulfillment or self-actualization without their lower-level needs being met first: food, water, shelter, and safety. In Puerto Rico, following the hurricanes fresh water, food, power, and other basic necessities were extremely scarce if not
non-existent, so according to the theory most individuals would just be working towards survival. Ficek (2018) describes the prolonged resource devastation and attests that students and educators in Puerto Rico met for months without electricity and many other infrastructure items. Also, many people left the island to live on the mainland following the hurricanes, but despite these difficulties Llorens (2018) describes a movement which emerged, “I will not quit on Puerto Rico,” which evidences the people’s commitment to remain on the island despite the lack of infrastructure. Despite the many studies using Maslow’s (1943) hierarchy the research on the hierarchy of needs and stress and educational persistence, why did so many people choose to stay in Puerto Rico and how were they able to persist in pursuing their educational goals despite the basic necessities being present? The events following the hurricanes challenges Maslow’s hierarchy of needs theory.

**Purpose Statement**

The purpose of this transcendental phenomenological study was to determine the characteristics of educators and students who persisted in their studies following Hurricanes Irma and Maria. The hurricanes destroyed most of the infrastructure in Puerto Rico in September 2017. Despite limited resources and enduring significant loss during the time period immediately following the hurricanes, secondary schools and universities continued to operate in Puerto Rico and students continued to attend classes. Persistence was generally defined as continuing an established procedure through an adverse situation. The theories guiding this study were Maslow’s (1943) hierarchy of needs and Hobfoll’s (1989) conservation of resources theory.

**Significance of the Study**

Schools depend on students to be persistent and continue their educational journeys in order to sustain their business model. The characteristics of the students of Puerto Rico could be
expanded upon, so schools could search for candidates possessing more of those attributes, which would lead them to a higher success and completion rate. There is some literature available regarding natural disasters and education, but the focus is on the retention and completion rates of students attending school following a natural disaster (Groppo & Kraehnert, 2017; Guilbert, Mesple-Somps, & De Vreyer, 2015; Nguyen & Minh Pham, 2018). The practical significance of this study is that it focused on the characteristics of the students who persisted in school, not just the percentages of students who finish. Schools can utilize this information in the process of recruiting students and retaining students. The other practical implication of this study is that hurricanes or other disasters will occur regularly, and it helps to know what people go through to obtain support.

The theoretical implication of this study was that it challenges the long held theory of Maslow’s (1943) hierarchy of needs and Hobfoll’s (1989) conversation of resources theory. Maslow’s theory asserts that if lower level needs are unmet, individuals cannot pursue higher level needs (Maslow, 1943). Hobfoll (1989) argues that the threat of resource loss or the actual resource loss would produce extreme stress in human beings. This stress would in turn make it necessary for an individual to attempt to either replace the resource or protect it. In this study, I examined the characteristics of students to challenge the theorists’ ideas.

The empirical implication of this study was that further research needs to be conducted on what happens to schooling following a natural disaster or any disruptor. The literature primarily focuses on retention rates and test scores (Groppo & Kraehnert, 2017; Cook & Beachy, 2018; Nguyen & Minh Pham, 2018; Guilbert et al., 2015). No related literatures focuses on students that were able to persist in their schooling following a natural disaster until this study.
Research Questions

The questions guiding this transcendental phenomenological study into the characteristics of students and educators who persisted with their educational endeavors were:

Central Research Question

What are educators’ and students’ perceptions of the characteristics necessary to persist in a difficult environment following a natural disaster? According to Ferguson (2018) the hurricanes dramatically affected all parts of daily life, but it especially impacted the school system.

Sub-Question One

How do educators and students describe the impact of Hurricanes Irma and Maria on their daily lives? Rodríguez-Díaz (2018) described the days after the hurricane and the impact the disaster had on her access to water and food which was tremendously obstructive to her daily routines.

Sub-Question Two

How do educators and students describe the learning environment before and after Hurricanes Irma and Maria struck Puerto Rico? With Puerto Rico’s Department of Education closing 167 schools prior to the disaster, the leadership needs to have information to understand what happens in education in the recent learning environment (Ferguson, 2018).

Sub-Question Three

How do educators and students describe the importance of higher education? There are some interesting studies that link education to health improvements, happiness levels, and environmental behaviors (Greve & Weatherall, 2019; Jongbloed, 2018; Sun et al., 2020). As this
study related to the lived experiences of this particular group, I explored the reason education was important to them.

**Definitions**

The following terms are relevant to this study:

1. *Natural Disaster*- A natural disaster is defined as a collective, shared tragedy (Oishi & Komiya, 2017).

2. *Stress*- A state in which environmental demands exceed an individual’s resources including coping skills (Reichenberger et al., 2018).

**Summary**

The purpose of this transcendental phenomenological study was to determine the characteristics of educators and students who persisted in their studies following Hurricanes Irma and Maria. The lessons that researchers will learn from Hurricanes Irma and Maria may not all arrive for many decades, as is often the case. Through this study, I hope to give students and educators in Puerto Rico an opportunity to voice their perspectives and celebrate the characteristics of the students that so diligently continued to pursue their education, despite the hardships before them. Puerto Rico has a varied history that begins with its occupation by the Spanish until its current territory status of the United States. Throughout that history, the people of Puerto Rico have fought to maintain their homes and identities. With the hurricanes striking the island in 2017, the people found a new battle of survival that they would need to fight. Yet not only did they continue to fight to survive, but they also continued to pursue their educational goals.
CHAPTER TWO: LITERATURE REVIEW

Overview

The purpose of this transcendental phenomenological study was to determine the characteristics of educators and students who persisted in their studies following Hurricanes Irma and Maria. This study focused on how basic needs being unmet, resources being scarce to non-existent, and stress combine to alter the educational environment for students. In this chapter, the two theoretical frameworks that guided this study will be discussed: Maslow’s (1943) hierarchy of needs and Hobfoll’s (1989) conservation of resources theory. Afterward, the related literature will be present and will include: long-term impact of historical natural disasters, natural disasters impact on children, natural disasters impact on well-being, the impact of stress, academic infrastructure in Puerto Rico, and mortality and infrastructure damage in Puerto Rico. This chapter concludes with a summary.

Theoretical Framework

Two theoretical frameworks guided this dissertation process: Maslow’s (1943) hierarchy of needs and Hobfoll’s (1989) conservation of resources theory. Both theories address the importance of having one’s basic needs met and the consequences of unmet needs and scarce resources (Maslow, 1943; Hobfoll 1989). However, in this study, I focused on students that continued to persist with their educational goals despite the theories that would argue that they would not be able to persist. This study focused on characteristics of those students that assured their ability to drive through their challenges and continue to pursue their educational goals.

Maslow’s Hierarchy of Needs

Maslow (1943) believed that human needs could be described in a hierarchy, a ranking system that identifies items by importance (Figure 1). The needs were represented as
physiological, safety, love/belonging, esteem, and finally self-actualization (Maslow, 1943).

**Figure 1: Maslow’s Hierarchy of Needs**

The largest tier of the hierarchy and direst of needs are the physiological needs (Figure 1). This includes air, water, food, shelter, clothing, and reproduction. Without many of the first-tier items, a human could possibly die. The second-largest tier is safety needs, which include personal security, employment, resources, health, and property. The second tier items help people to feel comfortable and secure and offer them the chance to provide for themselves. The third tier is love and belonging, which includes friendship, intimacy, family, and a sense of connection. The third tier is important to humans as social beings. The fourth tier is esteem, which includes respect, self-esteem, status, recognition, strength, and freedom. At the fourth tier, a human has achieved all the items below and they are now focused on their feelings concerning themselves. The fifth and highest tier is self-actualization: the desire to become the most one can be (Maslow, 1943). For many humans, education is a key component of self-actualization. Maslow designed the hierarchy and argued that if an individual’s lower needs are not met then self-actualization, which is the pinnacle of the hierarchy, cannot be obtained. In Puerto Rico following Hurricane Irma and Maria, the largest two areas of the hierarchy were largely unmet for many citizens; they were lacking most of the physiological needs and their safety was in
danger for many months (Arroyo, 2018, Ferfuson, 2018, Ficek, 2018). Arroyo (2018) described the loss of electricity and water. Water is a vital component of Maslow’s first level because humans need water to survive. The Arroyos would travel 40 minutes each way to obtain potable water (Arroyo, 2018). Electricity could fall in the first or second tier of Maslow’s hierarchy because humans can survive without it. Moreno and Shaw (2018) assert that electricity is vital and a basic human need as it ensures the community can cook and have light and thermal comfort. The loss of electricity meant the loss of refrigeration that kept food from spoiling in the Caribbean heat (Arroyo, 2018). The people of Puerto Rico did work together as neighbors to assist one another in securing those needs (Arroyo, 2018, Ferfuson, 2018, Ficek, 2018). Neighbors assisted by sharing generators to run the most vital electrical appliances like refrigeration and stoves (Arroyo, 2018). Safety, which is the second tier of Maslow’s hierarchy, was another concern for the citizens of Puerto Rico as looting was a serious problem. Neighbors took turns as guards during the night to keep their communities safe (Arroyo, 2018). With these lower needs being largely unmet in Puerto Rico for such an extended time, it is curious that the citizens continued their educational endeavors which is a higher hierarchy item.

A clinical psychologist with over 30 years’ experience, Healy (2016) describes how timeless Maslow’s hierarchy. “I was surprised to see that it was written in 1942, in the middle of World War II, and yet still seemed up to date and prescient in its content” (Healy, 2016, p. 313). Tripathi and Moakumla (2018) describe Maslow’s theory of self-actualization as a way for people to obtain a better quality of life because they are always seeking paths to move forward versus remaining static. Hale, Ricotta, Freed, Smith, and Huang (2018) through their research in graduate medical students and burnout, discuss how scholars now view Maslow’s needs as coexisting, where the needs integrate for an individual’s total well-being. Either the hierarchal or
the coexisting views both emphasize that without certain needs being met, the whole person will suffer.

Recently, researchers have utilized Maslow’s hierarchy in various studies. Where the study by Hale et al. (2018) focused on graduate student’s wellness, another study by Escardíbul and Afcha (2017) focused on job satisfaction for individuals in Spain who earned Ph.Ds. The study focused on the safety items in Maslow’s hierarchy which had a significant bearing on job satisfaction. The researchers concluded that while money was a contributing factor to job satisfaction, employees preferred permanent contracts, which would guarantee that they could set up homes in an area and build long-term relationships. Stewart, Nodoushani, and Stumpf (2018) utilized Maslow’s hierarchy to assist employers in not only retaining employees but ensuring their happiness was considered. They argued that employees that were stressed and constantly worried due to low job security would be less effective because their safety needs were not being met by employers. Ghatak and Singh (2019) utilized Maslow’s hierarchy to study social media usage in India. The researchers found that the need for love and belonging was the most significant concerning social media usage, and that self-actualization needs were the second most significant.

Conservation of Resources Theory

Another theory that is similar to Maslow’s needs-based theory is Hobfoll’s conservation of resources theory; Hobfoll (1989) proposed a theory that resource loss is a significant contributor to stress among humans. Hobfoll (2001) later updated this theory to include not only stress but post-traumatic stress disorder following natural disasters. In support of this theory, Moreno and Shaw (2018) found that people could reduce the stress due to the loss of basic resources through good communication to ensure communities were aware of how long the loss
would last. Mackey, Perrewé, and McAllister (2017) utilized Hobfoll’s theory to research the influence of organizational fit on stress levels for individuals. The researchers compared organizational fit with job strain and motivational cognitive stress. The researchers found that positive organizational fit greatly reduced the stress level of employees. Snyder et al. (2020) conducted a study of 312 adults from villages in North Kivu, a setting for ongoing chronic conflict. They found that resource loss was a consistent predictor of all four stress outcomes outlined in the conversation of resources theory: depression symptoms, anxiety symptoms, posttraumatic distress, and general distress. Shoss, Brummel, Probst, and Jiang (2020) utilizing data from 24,000 workers from 31 countries asserting that job insecurity provided a threat of loss of resources. This threat would result in individuals following the tenants of the conservation of resources theory, which included the need to seek alternative ability to protect their resources. The researchers also found that job insecurity resulted in a need to find alternative employment, as opposed to the desired effect of motivating employees to work harder.

With Maslow (1943) and Hobfoll (1989), the issue of increased stress due to basic needs being unmet and limited resource availability is present. With natural disasters, there is a time frame where resources are very scarce. In the case of the hurricanes Irma and Maria, Puerto Rico was without power, easy access to water, communication, and other necessities for up to eight months in some areas of the island (Arroyo 2018; Ferguson, 2018; Ficek, 2018). With the increase of stress due to a natural disaster, many functions of daily life including that of schooling could have been affected. This study sought to describe the lived experiences of educators and students following hurricanes Irma and Maria in 2017 and their ability to persist in obtaining their goals despite the research from the theorist. This study also sought to gain the
perspectives of the future impact the natural disaster may have on schooling from both the educators and students.

**Related Literature**

Through an examination of the related literature, the following areas emerge in the current literature available on a natural disaster’s effect on education: the long-term effects of historical natural disasters, a natural disaster’s impact on children, a natural disaster’s impact on well-being, the effects of stress on individuals, the academic infrastructure of Puerto Rico, and the mortality and infrastructure damage in Puerto Rico following hurricanes Irma and Maria. As historians and researchers have investigated previous natural disasters to study consequences, there is limited literature that explores education and a natural disaster (Groppo & Kraehnert, 2017; Guilbert et al., 2015; Nguyen & Minh Pham, 2018).

**Disasters and Education**

There are limited studies that look at natural disasters and education. Most of those studies focus on student attendance issues following a natural disaster and withdrawal from school (Groppo & Kraehnert, 2017; Cook & Beachy, 2018). The studies found that attendance was significantly limited following a natural disaster. This study focused on the students that went against previous studies and continued their education despite the challenges.

Groppo and Kraehnert (2017) investigated Mongolian households following several mass livestock demises. The livestock demises were due to severely harsh winters that occurred on three different occasions from 1999 to 2002. In Mongolia, approximately 35% of households depend on herding as a major employment sector. The researchers administered the *Coping with Shocks in Mongolia Household Panel Survey* that was conducted in 1,786 households. They found that the children were less likely to complete mandatory minimum education during the
time of the livestock demise than in years that did not result in such hardships for the families. The researchers concluded that there may be some effect from school closures during the time, but the majority of the impact was due to household loss of assets and income due to the disasters.

Cook and Beachy (2018) conducted research involving 96 children from an agricultural community in rural Haiti following Hurricane Matthew, which struck on October 4, 2016. The researchers found that 46% of children stopped attending school as a result of the hurricane. The study was conducted through surveys that were administered in writing and orally to assist parents with limited literacy skills. Their study identified two primary causes for the students leaving school: the loss of income the family suffered due to crop and livestock damage and the need for the children’s labor on the farms. The schools required tuition for attendance, so after the hurricane, many families could no longer afford to pay them. The median income of the community surveyed was less than $2.00 a day.

Nguyen and Minh Pham (2018) found that floods tended to decrease the number of grades students completed in affected regions. Furthermore, they found that natural disasters had a significant effect on students’ cognitive abilities. The researchers utilized data from the Young Lives project which was collected on 12,000 children that are in poverty-stricken areas in the following countries: Ethiopia, India, Peru, and Vietnam. The children referred to in this study would have been exposed to droughts, floods, or frosts and hailstorms. The most significant findings were related to floods. The researchers found that floods would decrease the amount of a child’s completed education by 1.8% to 3.8% depending on the area. They also found that frost and hailstorms decreased the math scores of children in India.
Guilber et al. (2015) studied the enrollment and completion rates of students affected by desert locust invasions occurring in Mali from 1987 to 1989. The researchers asserted that desert locust invasions impact over 65 countries. The data for the locust invasions was obtained from the Desert Locust Information Service (DLIS). The researchers then utilized census and educational data to differentiate the educational outcomes for affected and unaffected areas. They found that there was a significant decrease in enrollment rates for boys as a result of the disasters and there was a significant impact on school attainment for both boys and girls. Also, they found that less than 48% of boys and 36% of girls were able to complete the primary level during this time frame. The researchers believe that the microeconomic impact will be underestimated due to the long-term effect the educational impact will have on the economy of the area.

Primary age children are not old enough to discontinue schooling. There are many other issues that this group encounters. Gibbs et al. (2019) conducted research on primary school-aged children following a major bushfire in Australia in 2009. The comparisons were drawn and analyzed from low, medium, and high disaster-affected primary schools. They utilized enrollment data and the standardized national testing data of 33,690 students enrolled between grades three and five. The researchers concluded that there were lower scores in reading and numeracy in the schools that were in higher impact areas during the natural disaster. The researchers believe part of the depressions was caused by the development of post-traumatic stress disorder following early trauma experiences.

Most of the literature available deals with the educational impact of a natural disaster due to decreased enrollment in schools by students that were affected by the disaster. Based on the current literature, attendance and test scores should be lower as a result of the natural disaster.
With the current literature available, there is a gap in the area of students that can persist with their education and the characteristics they possess. This study focused on the perceptions of those characteristics from the viewpoint of students and educators.

**Long-term Impact of Historical Natural Disasters**

Throughout history, there have been many well-documented natural disasters, and it is important to understand the long-term impact of those disasters on other areas that may also impact education. One of the first areas to address for long-term impact is that of the economy. Natural disasters are estimated to cost an average of $901 million annually (Caruso, 2017). Vu and Noy (2015) found that a 2008 earthquake in China was particularly detrimental to economic development. They were able to focus on several natural disasters, but the best comparison came from the earthquake. The most pronounced areas with this concern had a very high mortality rate, despite the Chinese government’s attempts to distribute aid and invest in reconstruction; areas with lower mortality rates were able to recover within a year with this investment assistance.

Lynham, Noy, and Page (2017) focused on the long-term economy. Their study took place after a May 23, 1960 tsunami struck Hilo killing 61 people and injuring 282 people. The tsunami did not impact other cities on the island. The researchers asserted that the long-term impact of a natural disaster was not often studied as compared to the short-term impact. The researchers compared economic data for population, employment, wages, and production of the affected Hilo against other unaffected cities on the island. They found that the unemployment rate was 32% higher 15 years later in Hilo than the cities in the area not affected by the tsunami. The economy has a profound impact on education as evidenced by the 2017 research of Shah and Steinberg. They found that if the opportunity cost of education outweighed what children could
make in the workforce; consequently, these children would end up in the workforce instead of in school. Their research involved the Annual Status of Education Report’s (ASER) data involving 2 million children from rural districts in India. When rainfall shocks occurred, wages would increase by 2%. This would drive more children into the workforce. As a result, math test scores declined 2%-7% during this time, and the probability of a student attending school decreased by 1% (Shah and Steinberg, 2017).

There are also studies investigating wars, negative social preferences, and population density changes due to natural disasters. Lee (2018) found many historical instances where wars were triggered as a result of natural disasters in China. Lee’s research considered natural disasters, famines, epidemics, and nomadic invasions which spanned from 1470 to 1911. The researcher found that epidemics and famine significantly contributed to internal wars. Becchetti, Castriota, and Conzo (2017) found that peoples’ generosity was negatively impacted following shocks due to natural disasters. The researchers analyzed information following a 2004 tsunami in Sri Lanka. One finding that they made was that the happiness of the people of Sri Lanka was negatively impacted following a natural disaster. This could also lower a person’s willingness to show generosity to others. The researchers argued that the findings were consistent with short-term studies that concluded that social preferences were detrimentally affected by shocks.

Wang and Wang (2019) conducted a study to determine if population density was affected by natural disasters in counties located in the United States. The researchers analyzed the time frame of 1960-2000, where they asserted that there some of the largest natural disasters recorded in history of the area. They utilized data pertaining to county populations that experienced the following natural disasters: earthquakes, tornadoes, and hurricanes. They found that there were no significant adverse effects on population density in the areas affected by those natural
disasters. While wars and generosity may not seem to have a direct impact on education, these affect many daily life activities, so education will also be impacted by them. Many wars take young people away during vital learning years, and generosity is important for many students to have the ability to continue their educational endeavors.

However, Drupsteen and Guldenmund (2014) argued that emergencies and disasters, despite being negative, could result in the members of a community learning and improving techniques to cope with disasters. This can improve conditions in the future to avoid repeating the incident or disaster. One such lesson involves early warning systems, which includes their development and use. Davis (2019) found that the death toll due to modern natural disasters has decreased dramatically due to effective warning systems and evacuation planning. He asserted that from 1977 to 2016 there were significantly fewer deaths per capita later in this period due to the warning systems. There are other examples where natural disasters have yielded positive benefits for groups. Torrence (2016) found that despite extreme volcanic activity in the Willaumez Peninsula, Papua New Guinea area over the past 40,000 years, the population developed a measure of resilience that helped them survive. The researcher argued that studies typically focused on the negative and short-term affects while ignoring the long-term ability of people to adapt and survive. The researcher also stated that archaeologists typically credit volcanic disasters with the extinction of a civilization. One item that may have helped the residents survive is the trade of obsidian with other communities, which may have fostered the social ties needed to enable the residents to seek shelter with others during the volcanic events.

Ho, Frankenberg, Sumantri, and Thomas (2017) found that a lower mortality rate over a five-year period following a natural disaster. The positive results were for males that recently survived a 2004 Sumatra Andaman earthquake and Indian Ocean tsunami. The researchers
attribute the lower rate to the improvement of health care services through the infusion of aid. The researchers did recognize that there was a significantly high mortality rate because of the tsunami, approximately 170,000 people. Therefore, leaving a possibly healthier population to survive. Moreno and Shaw (2018) found that gender equality improved following the 2010 earthquake and tsunami in Chile. Their study was conducted in Talcahuano, a city that was heavily affected by the destruction of many homes and businesses and power outages following a 2010 earthquake. They conducted qualitative research with 126 individuals during multiple time periods spanning 2010 to 2017. They found that when a natural disaster occurs, women are particularly more vulnerable, but as they persist, it changes the gender norms that people hold, therefore improving gender equality among the people. The community showed a strong bond similar to Puerto Rico, where the people in their research bonded together and formed community kitchens to make meals available to families that did not have the resources to cook. They also appointed community security guards to stop looting and crime (Arroyo, 2018).

There are some unexpected consequences of a natural disaster. For instance, Heersink, Peterson, and Jenkins (2017) argued that voters punished incumbent politicians following a natural disaster despite the equitable allocation of tremendous aid. Despite previous studies arguing that the allocation of aid made the difference, they found the opposite. One example they gave was of Herbert Hoover as the secretary of commerce and the immense relief that he was able to provide following the Great Mississippi Flood of 1927. Despite the fact that the relief was greatly exploited by the media and the campaign, in the most significantly affected counties in the United States, Hoover lost between 13-15% of the vote in the two-party vote share. Nandi, Mazumdar, and Behrman (2018) compared the birth rates and spacing changes for the five years following the 2001 Gujarat earthquake which killed 20,000 people and injured 167,000 people in
the five previous years. The researchers utilized District-Level Household Surveys of India which were completed in 2002-2004 by 620,107 households and 2007-2008 by 720,320 households. They found that birth rates rose following the natural disaster, which reduced birth spacing for children. Furthermore, there was a lowered male birth rate during the same time period. The researchers offered one possible cause for the increased birth rates could be the replacement theory of fertility that states that women who experience the death of a child are likely to try to replace the child. Governmental continuity and birth rates both affect the educational climate in a community.

This research suggests that natural disasters can be detrimental economically to an area, improve the resilience of a group, lower mortality rates due to increased healthcare offerings for a time following a disaster, improve gender equality as people rely heavily on each other, trigger wars, lower generosity as people are holding on to their resources, and yield learning opportunities to help avoid a similar disaster in the future (Caruso, 2017; Vu and Noy, 2015; Lynham et al., 2017; Shah and Steinberg, 2017; Lee, 2018; Becchetti et al., 2017; Wang and Wang, 2019; Drupsteen and Guldenmund, 2014; Davis 2019; Torrence, 2016; Ho et al., 2017; Moreno and Shaw, 2018; Heersink et al., 2017; Nandi et al., 2018). The consequences of a natural disaster appear to be both positive and negative when considering global history. However, there appears to be a gap in the literature on the impact on schooling following a natural disaster and the characteristics of the students that were able to persist with their educations. This phenomenological study contributes to increasing the findings of education during natural disasters in the context of the lived experiences of Puerto Rican educators and students following hurricanes Irma and Maria in 2017 and the resulting devastation to the infrastructure there.
Natural Disasters Impact on Well-Being

When a natural disaster occurs there are many consequences, such as the capital resources that are lost immediately. Adeagbo, Daramola, Carim-Sanni, Akujobi, and Ukpong (2016) argued that consequences should be identified as both tangible and intangible, for example, a death would tangibly affect a community by the economic loss resulting from the individuals no longer able to be an active and productive member of the community, but the intangible loss would be the social and psychological effect on the community. Both tangible and intangible consequences would affect the well-being of the community. Another example these researchers described as the tangible loss of the value of production and the intangible loss of the competitiveness and reputation of an area following a natural disaster. Hamama-Raz et al. (2017) found that after a typhoon occurred on November 8, 2013, in the Philippines an individual’s subjective well-being could be predicted by the various resources the individual had following the disaster like family connections. One important item was the social relations that also saw a predictive nature to social well-being. Lindahl et al. (2016) found that individuals when faced with potential disasters could work together and pool their resources to avoid a disaster.

Risk of natural disasters is adding to psychiatric disorders among youth. Felix, Hernández, Bravo, and Canino (2011) conducted research on 1,886 children age 4 through 17 in Puerto Rico following Hurricane Georges in September 1998. The researchers utilized the Diagnostic Interview Schedule for Children (DISC-IV) with parallel versions for both parents and youth at eighteen and thirty months after the hurricane. They found that children tended to experience internalized disorders at the eighteen-month mark, but there was a good improvement at the thirty-month mark. This research demonstrates children’s resilience after a major trauma event such as a natural disaster.
Another stressor that comes from a natural disaster includes the disruption to daily life. Phipps and Ozanne (2017) found that households experiencing major routine disruptions would bring them to a state of unease. The researchers asserted that routines were an integral part of life and well-being. Minor disruptions to people’s daily routines would cause unease, but major and prolonged disruptions would disrupt the ontological notion that their world is safe and secure. Conzo (2017) asserted that natural disasters affected the way people were willing to take risks and trust one another. They argued that as positive and persistent relief is increased, the psychological consequences would diminish. Kang and Skidmore (2018) studied the effects of several natural disasters on social trust including typhoons, heavy rain, heavy snow, and strong winds and waves. They found that the satisfaction level an individual has with the governmental response to a natural disaster may weaken an individual’s social trust, particularly if the government responds inadequately. They found that if the community came together and neighbors were able to assist one another, the effect was a stronger social trust for individuals. Social trust is an important factor in well-being and risk management for individuals (Conzo, 2017). With all of the stress due to routine disruptions and the lack of resources, an individual is in significant danger of a decrease in well-being. The literature suggests that social relations are a key component to increased well-being in a time of resource disruption (Hamama-Raz, 2017).

The issue of well-being is very important for many reasons as well as the predictors of an individual’s well-being. Rettew, Satz, and Joshi (2019) argued that well-being assisted students through protective functions, while low subjective well-being was associated with negative academic and health outcomes for individuals. They also asserted that teachers played a crucial role in promoting the overall health of their students; they can help combat stressors that can occur during a natural disaster. They stated that many colleges and universities have begun to
implement courses on happiness and well-being to assist students. Al-Ajlani, Van Ootegem, and Verhofstadt (2018) showed that, statistically, health and family life are the most critical aspects of well-being when compared against social life, income, and education for younger individuals. They compared the same factors for older individuals and found that health, education, and social life were crucial to their well-being. King (2017) found that social concern, and achievement goals were a positive predictor of well-being for students because they elicited positive emotions such as pride, satisfaction, and excitement. However, the pursuit of social status was detrimental to well-being for students, because they would typically avoid seeking help and possibly engage in destructive behaviors.

**Natural Disasters Impact on Children**

There have been several studies conducted that have focused on the impact a natural disaster has on children. Dyregrov, Yule, and Olff (2018) assert that 175 million children are affected each year by natural disasters. With natural disasters affecting this many children annually, it stands to reason that this area is very important to study. Simmons and Douglas (2018) found that children exposed to the stress of a natural disaster could have damage in their prefrontal cortex area of the brain, possibly resulting in problems with learning and behavior for a lifetime. The researchers found that in the wake of such natural disasters, children would show many symptoms commonly associated with posttraumatic stress disorder. They also found that students would have physical symptoms such as aches and pains. They would revert to extremely clingy behaviors towards their parents and may begin to wet the bed or behave immaturely.

By looking at over 100 years of natural disasters in Latin America, Caruso (2017) found that children in utero and young children were the most vulnerable to a natural disaster and the effects included less human capital accumulation, fewer assets, and worse health as adults. They
also found that children were more likely to become child laborers if born to mothers that experienced a natural disaster. Dyregrov, Yule, and Olff (2018) argued that the number of children affected by natural disasters each year is rising due to climate change resulting in possible depression, post-traumatic stress disorder, and other mental health problems. They found that children given the opportunities to participate in disaster risk reduction would improve their interpersonal skills and assist them in dealing with natural disasters when they occur. Seddighi, Salmani, Javadi, and Seddighi (2019) assert that violence against children is escalated during and following a natural disaster. Children are typically hurt by parents or relatives, and reporting is limited and there is a weakened child protection system. This problem is exacerbated by the lack of evidence to raise humanitarian aid to prevent these situations. Children are especially vulnerable due to their dependent and fragile natures, and in developing countries, children are a high percentage of the population. This problem is exacerbated by the lack of evidence to raise humanitarian aid to prevent these situations (Sedighi et al., 2019).

One issue that impacts students dramatically following a natural disaster is their health and nutrition. Thamarapani (2021) utilized a panel dataset comprised of children in Indonesia that were exposed to multiple natural disasters. Due to poor nutrition, the girls were on average .19 standard deviations shorter than their counterparts who did not experience the same traumas. The researchers argued that their poor nutrition would affect them through adulthood. Utilizing data from the Puerto Rican Elderly Health Conditions database conducted on 4,293 targeted homes from 2002 to 2007, Palloni, McEniry, Huangfu, and Beltran-Sanchez (2020) gathered information on the set of individuals born on or before 1919. These individuals were all exposed to the time-period during 1918, some in utero that encompassed two disasters: the Spanish Flu and the San Fermin earthquake in Puerto Rico. This time frame marked a time of lowered
income for households, lack of access to health services, and massive disruption of food supplies for these families. The researchers looked at early markers of nutritional status which were knee height and adjusted height. They found the most significant impact was on females; they had an average height loss of 2.74 cm following the earthquake. For females affected by both disasters, there is an average height loss of 8.92 cm. Height is a marker for nutrition, but the effect nutrition has on education is vitally important to this research. The researchers also found that this would affect brain tissue growth, which made it more difficult for students to learn. Perez-Escamilla et al. (2018) found in their research that poor nutrition led to reduced physical labor capacity, lower educational attainment and economic potential, shortened life expectancy, and reduced capacity to care for the participant’s children. Poh et al. (2019) conducted a study on 2,406 Malaysian children aged 5 to 12 years. The researchers found that children with nutritional issues, such as childhood obesity were twice as likely to have poor non-verbal IQ scores as their counterparts.

The Impact of Stress

Researchers have studied the impact of stress in different situations in education. Researchers Flinn, Miller, Pyatka, Brewer, Schneider, and Cao (2016) showed that the stress of a critical instructor hindered medical students from developing surgical skills. Cantrell, Meyer, and Mosack (2017) found that stress was significantly increased through simulation activities in nursing students. The researchers found the increased stress to be a barrier to learning, although they argued that some stress was necessary for optimum learning. In a study of 96 individuals, Kluen, Nixon, Agorastos, Wiedemann, and Schwabe (2017) found that stress impaired a learner’s ability to utilize pre-existing schema in acquiring new information; this pre-existing schema helps a learner by comparing a learned process with a new process. The researchers also
found that stress affected the prefrontal functions of the brain. Utilizing a sample of 1,491 first-year college students, Johnson, Wasserman, Yildirim, and Yonai (2014) discovered that stress related to the campus environment affected the persistence level of college students regardless of race. The students experiencing greater stressors had an impact on their desire and commitment to the particular institution. The stressors include those related to the academic environment and social difficulty. In all of the previously reviewed research, stress hindered the educational process and hindered the possibility for students to persist in their educational endeavors.

Researchers have also studied the impact of stress on individuals’ physical and emotional well-being. Marraffa (2015) discussed how stress has been identified to increase instances in children of hypertension, adiposity, and the inability to effectively regulate their emotions. In this study involving thirty sixth-grade students, Marraffa found that yoga was an effective way to assist children in reducing stress. Morris, Martini, and Preen (2016) found that a cancer diagnosis of a parent would significantly stress a child and caused higher levels of anxiety, depression, reduced self-esteem, and raised their concern for their health. This stress was most likely derived from the children’s reliance on the family, the concern for the parent’s survival, specific treatment elements, and concern for the future of the family. When given more information, such as procedures, timeframes, and positive prognosis, children experienced less stress. Marlow (2018) discussed the physical effects of stress: increased tendencies for colds, asthma attacks, eczema flare-ups, acid reflux, and irritable bowel syndrome. The researcher asserted that some stress could be beneficial, but patients were not educated on the relationship between stress and the detrimental consequences of it. Flinn et al. (2016) asserted that stress raised the heart rate and blood pressure of the individual experiencing the stress. Through their study of 43 medical students, they also found that stress negatively affected learning and retention in a medical
training activity. Odenbring (2018) investigated health issues related to students’ stress and described the mental health consequences for students who are attempting to meet expectations of being strong boys and super girls. The girls had an increased risk of self-harm behavior, and the boys had issues with eating disorders and other forms of anxiety. A major issue for the boys was self-reporting, which reduced their opportunities to reach out for help. The girls tended to have more social support networks and were more likely to ask for help. Reichenberger et al. (2018) found that stress led to decreased taste-eating (eating without regard to the taste of foods) which negatively impacts weight gain in individuals and increases rates of obesity. They found that women were more susceptible to stress eating than men, and some individuals had difficulty eating during periods of high stress. This research shows that stress has a significant detrimental effect on an individual physiologically.

Researchers have also studied other effects of stress on individuals. Starcke and Brand (2016) found that individuals under stress tended to make decisions that were more disadvantageous and more risk-seeking than individuals with normal stress levels. Their study was comprised of 1,829 participants utilizing a stress-induction and control induction group. The researchers found that the stress group was more likely to make decisions based on increased reward-seeking and risk-taking. They asserted that this was due to alterations in dopamine firing rates and reduced executive control due to the hindrance of optimal prefrontal cortex functioning. The researchers also discussed how poor decisions made by stressed individuals can include unhealthy lifestyle choices such as smoking, drinking, and unhealthy diet which may have long-term consequences. Wingenfeld, Roepke, Duesenberg, and Otte (2017) found that stress negatively affected empathy levels in participants. Amaya, Melnyk, and Neale (2018) asserted that stress was attributed to burn-out, compassion fatigue, depression, and a poor work-life
balance. While decreased empathy levels, poor decision-making abilities, and burn-out can be attributed to other items, stress plays a large role in increasing these.

**Impact of Higher Education**

This study directly relates to individuals continuing their educational endeavors during a period of high stress and significant resource devastation. I wanted to analyze studies that show the impact of secondary and higher education. If students choose to continue their education, there must be some benefits derived from their continued endeavors. Sun, Yang, Li, and Zhang (2020) conducted a study of 8,710 individuals through their responses to the 2013 *China General Social Survey*. They found that individuals with higher education levels tended to be more environmentally conscious. The researchers also stated that a higher level of education also improved their socioeconomic status. The individuals also demanded more economically affordable items to protect the environment and provide environmentally friendly behaviors.

Education levels can also predict health improvements. Greve and Weatherall (2019) utilized data collected from the *Danish Work Environment Cohort Study* from the years 1995 and 2000, they studied information from a particular group of students that participated in a grant scheme in 1988 for Danish students. They utilized their data to correlate education and body mass index. They found that students completing higher education had a significantly reduced probability of being overweight among males in their study. The participants came from a low-income background, which in itself represented a higher likelihood of them being overweight.

The question of how education affects happiness is one that many researchers have approached. One study conducted by Jongbloed (2018) utilized the European Social Survey conducted in 2012 with a sample of 50,000 individuals from 27 European countries. The researchers found that when comparing well-being as described as satisfaction with life and
flourishing that education was a significant contributing factor in both dimensions. In another study focusing on happiness, Tan, Luo, and Zhang (2020) utilized data collected in the Chinese General Social Survey in 2013, found that residents with higher education enjoyed better health conditions and happiness levels than residents with lower education, using Shapley value decomposition methodology.

Economic growth is an important factor when considering the benefits of education, especially in an economically depressed area like Puerto Rico. Maneejuk and Yamaka (2021) utilizing data collected from 2000-2018, found that higher education had a profound impact on economic growth in ASEAN-5 countries: Indonesia, Malaysia, the Philippines, Singapore, and Thailand. Tomaszewski, Perales, Xiang, and Kubler (2021) utilized the data collected through the Australian Longitudinal Census Dataset and the Household, Income, and Labour Dynamics in Australia Survey to compare students with different socio-economic backgrounds. The researchers found that higher education dramatically increased the wage potential and other benefits for lower socio-economic background students over time.

**Academic Infrastructure in Puerto Rico**

The academic infrastructure of an area is important to review when looking at the impact of disasters on schooling. Puerto Rico had difficulty with its education budgets and school before Hurricane Maria. Ferguson (2018) stated that the Puerto Rico Department of Education closed 167 schools before the hurricane, due to massive debt and improper funding and technology for the schools. These closures took place at the end of the 2017 school year. Some of these schools were closed due to lowered student count; there has been a migration of Puerto Rican students to the mainland United States over the past few decades. This problem was exacerbated by the
hurricanes. Between September 2017 and February 2018 an additional 25,000 to 30,000 students left Puerto Rico (Ferguson, 2018).

To further understand the academic infrastructure, the research in this section is focused on the educational policies related to the language utilized in schools in Puerto Rico that was addressed multiple times. There had been continued debate for over a century regarding whether students in Puerto Rico would be taught in Spanish or English. Maldonado-Valentín (2016) discusses the educational policies in Puerto Rico that adjusted the language utilized in schools back and forth from Spanish to English from 1898 until 1949. It was finally settled that Spanish would be the primary language and English would be a subject taught in school in 1949. During that time, Spanish and English as the primary language in schools were addressed seven times (Maldonado-Valentín, 2016). Eisenstein et al. (2018) asserted that speaking English is often rejected in Puerto Rico as a preservation method against United States domination. The students are aware of the statistic that many successful Puerto Ricans do not speak English. This aversion to English has also hindered the Puerto Ricans in assimilating during their migration to the states following the hurricanes. The debate was settled with Spanish becoming the language of Puerto Rican schools, but English is taught as a subject in every grade (Maldonado-Valentin, 2016).

Language is not the only issue that has been debated in Puerto Rican schools. Rosado, Pfeiffer, and Petscher (2015) contend that gifted education has been historically unsupported in Puerto Rico, but there is an improved amount of interest in providing gifted education services to the population. Their research focused on gifted identification techniques. The researchers found that the Gifted Rating Scales-School Form translated into Spanish yielded similar results identifying students who are gifted in 618 Puerto Rican students to their mainland United States counterparts. The researchers asserted that cost-effectively identifying Puerto Rican students
who are gifted was of utmost importance because the cost was the major barrier to increased
gifted identification and programs in Puerto Rico. Colón (2015) discussed the lack of investment
in science education in Puerto Rico that has been especially threatened with more budget cuts
due to the rapidly increasing debt crisis of the island. He asserted that the high unemployment
level and the shrinking economy were already causing many of the island’s most gifted scientists
and biomedical professionals to leave. The government of Puerto Rico was considering even
increasing funding cuts to higher education to bridge their funding gaps for the debt payments of
the island. Ferguson (2018) discussed the non-existence of charter schools before Hurricane
Maria, but Puerto Rico’s governor, Richardo Rosello announced that charter schools would be a
part of the efforts to rebuild the school systems. Sparks and Superville (2017) discussed how the
needs of the island were so significant following the storms that school re-openings would take a
back seat to other more immediate needs for residents. Schools were used in the beginning as
shelters. Another significant delay for school reopening was problems with rats and mold
(Ferguson, 2018). Unfortunately, with an already funding-deprived educational system in place,
items that were just becoming a problem before the storm became overwhelming issues that
would be very difficult for the system to manage.

Mortality and Infrastructure Damage in Puerto Rico

Following the hurricanes Irma and Maria in 2017, Puerto Rico sustained massive
infrastructure damage and casualties (Kishore et al., 2018; Alcorn, 2017; Ficek, 2018). The death
toll due to the hurricanes was particularly high (Kishore et al., 2018). Modern life grounded to a
halt because there was no electricity, cell service, easy access to water, or internet service (Ficek,
2018). The economy will be harmed for years due to the damage to coffee plants and their
protective trees, two major agricultural products in Puerto Rico (Vandermeer, 2017). Despite the
problems, there is a sense that Puerto Rico will survive because their citizens stepped up to help their neighbors and Puerto Ricans from around the world offered assistance (Rodríguez-Díaz, 2018).

The death toll due to the hurricanes was a particularly interesting debate. Kishore, et al. (2018) argued that despite the initially quoted death count of 64, the actual count was closer to 4,645 deaths. Utilizing a random survey of 3,299 households across Puerto Rico, they estimated the death count was 70 times more than what was reported. They attributed many of these deaths to interrupted health care services because of the hurricanes. Unlike previous studies from Ho, Frankenberg, Sumantri, and Thomas (2017) that showed an increase in health care services due to aid and a lowered mortality rate for an area, Kishore et al. (2018) found that there were significantly fewer dependable health services following the hurricanes in Puerto Rico. This situation was compounded by the heavy reliance on health care services by Puerto Ricans. Alcorn (2017) asserted that an astounding one in seven Puerto Ricans suffered from diabetes and 6,000 patients depended on dialysis treatments to deal with their kidney issues. With the strain on hospitals to generate electricity from a diminished supply of diesel fuel this infrastructure damage was a dire threat for thousands of patients. The tainted water and lack of cooling devices did not help the health situation either. While younger people were able to leave and find refuge in other areas, older individuals had to remain in place. Kishore et al. (2018) reported that the median age of people who left after the hurricanes was 25 as compared to the median age of 50 for those who stayed and died in remote areas.

Ficek (2018) depicted how the niceties associated with modern life were interrupted due to the infrastructure loss, which resulted in some places losing power for up to 80 days, a water supply that was tainted with industrial chemicals, and communication and transportation loss in
the region. Arturo, Stephens, and Colón (2018) argued that it was the longest power outage in United States history. Arroyo (2018) described how people waited for six to ten hours in line for gasoline not knowing if the station would even have any left when it was their turn at the pump. Ferguson (2018) stated that schools were without power and then immediately repurposed as shelters displacing 350,000 students out of school for an extended period of time. Arroyo (2018) described how communities were without water, produce, canned goods, gasoline, electricity, communications, batteries, and other essentials for weeks following the hurricanes. Ficek (2018) described a situation so dire that many people were walking around like “zombies” making it difficult to drive on the roads for fear of accidentally running into someone. Safety for the neighborhoods was a major concern as well. Arroyo (2018) discussed the issue of safety and the necessity of men taking turns keeping watch at night for their neighbors. Another issue that comes with the loss of power and communications is banking. For many Puerto Ricans, this meant that after the hurricanes, they had to utilize cash, but they had no way to obtain cash from their accounts (Arroyo, 2018).

The long-term economic effects are not yet known regarding the hurricanes and Puerto Rico. Vandermeer (2017) exposes the loss of the coffee plants and the trees that are a necessary shade producer for the coffee farms, which is the mainstay of Puerto Rico’s agricultural economy. This reinforces previous research that showed that following a disaster there could be long-term economic repercussions in an area (Lynham et al., 2017). Burke (2018) described another significant loss due to Hurricane Maria in the scientific community as work that had been cultivated and nurtured over more than a decade was destroyed within a few hours. Another item that will seriously affect the economic welfare of Puerto Rico is the migration of citizens. Hinojosa (2018) utilized the School Enrollment Migration Index to find a loss of 40,000 students
in the Puerto Rican public school system from the 2017-2018 school year to the 2018-2019 school year, which would cause a loss of funding for public education.

Although the previous studies described the negative aspects of the aftermath of hurricanes Irma and Maria in Puerto Rico, there are also some positive aspects to the disaster and the people’s will to prevail. Zorrilla (2017) portrayed the culture of responsibility for family that helped people get through the disaster by staying and working together to survive: “among our cultural values is responsibility for family, which I believe is what kept the number of people in shelters as low as about 12,000” (Zorrilla, 2017, p. 1801). Zorrilla basically argued that families took in one another for prolonged periods to deal with disaster. Rodríguez-Díaz (2018) refers to the devastation from the hurricanes but also found that Puerto Ricans from around the world were instrumental in mounting social media campaigns in order to procure aid for the islands’ current inhabitants displaying the colonial nature of the people of Puerto Rico. Arroyo (2018) asserted that neighbors helped one another by sharing precious resources, cleaning up damaged homes and other structures, running extension cords between houses to share generators, and even taking turns keeping watch during the nights to ensure the communities were safe. Moreno and Shaw (2018) emphasized that community resilience can lessen the severity of the negative impacts from disasters and reduce recovery periods. Life in Puerto Rico continued despite the outages, Ficek (2018) described teaching classes at the university with no power for months. These articles describe a determined people that were instrumental in taking care of one another and maintaining their way of life despite the adversity they were facing.

Summary

Caruso (2017) argues that natural disasters cost an average of $901 million annually in infrastructure damage. This cost only considers the most immediate consequences of a natural
disaster. There are long-term consequences to natural disasters from areas such as nutrition issues, trauma issues, and wellbeing issues (Hamama-Raz, 2017; Felix et al., 2011; Phipps, and Ozanne, 2017).

The current literature regarding natural disasters and education focused on the retention and completion rates of students attending school following a natural disaster (Groppo & Kraehnert, 2017; Guilbert et al., 2015; Nguyen & Minh Pham, 2018). There was a gap in the literature on the impact on schooling and the educational system for students and educators following a natural disaster. There was also a gap in the literature in describing students that do persist through hardships and disasters. This phenomenological study explored the lived experiences of educators and students following the hurricanes and resulting infrastructure loss, how they described the characteristics of the persistent students who continued to seek their education, and their perceptions of the impact the hurricanes had on the schooling in Puerto Rico.

Historical research displays positive and negative results following natural disasters. Research reveals that improved health due to foreign aid (Ho, Frankenberg, Sumantri, & Thomas, 2017), a damaged economy (Vu and Noy, 2015), improved gender equality (Moreno & Shaw, 2018), and wars being triggered (Lee, 2018) are just a few of the effects from a natural disaster. In some instances, there was vast improvement due to aid and the reliance of individuals on one another.

Children are especially vulnerable during and following a natural disaster because of their dependence on adults and their fragile nature. They can suffer brain damage that will lead to lifetime learning and behavior issues (Simmons & Douglas, 2018). Caruso (2017) found that children in utero and young children that experienced a natural disaster were likely to have less
capital accumulation, fewer assets, and worse health as adults. Dyregrov, Yule, and Olff (2018) argued that children were likely to develop depression, post-traumatic stress disorder, and other mental health problems. Seddighi, Salmani, Javadi, and Seddighi (2019) found that violence against children is escalated during and following a natural disaster due to weakened child protection systems.

There is some existing research on natural disasters that focus on the well-being of the individual. The effect of stress has also been analyzed by different researchers. They have found that stress negatively impacts the education process and the persistence level of students (Cantrell, Meyer, & Mosack, 2017; Flinn, Miller, Pyatka, Brewer, Schneider, & Cao, 2016; Johnson, Wasserman, Yildirim, & Yonai, 2014; Kluen, Nixon, Agorastos, Wiedemann, & Schwabe, 2017). In most of these studies, student attendance was severely reduced as an effect of the stress. Research also indicates that stress has severe physiological consequences such as anxiety, depression, hypertension, lowered self-esteem, adiposity, and others (Marraffa, 2015; Morris, Martini, & Preen, 2016).

The purpose of this transcendental phenomenological study was to determine the characteristics of educators and students who persisted in their studies following Hurricanes Irma and Maria. It is important to understand the educational environment of Puerto Rico before the hurricanes occurred. According to Maldonado-Valentín (2016), there has been an issue in the Puerto Rican schools on the choice of language instruction since 1898, which has resulted in seven policy changes towards the topic. Rosado, Pfeiffer, and Petscher (2015) contend that gifted education was previously unsupported in Puerto Rico, but it has recently gained appreciation. Colón (2015) discusses the debt of the area making budget cuts in education necessary despite the research of educations’ importance to improving the economy. Ferguson (2018) addressed
the 167 school closures at the end of the previous school year before the hurricanes hit the island due to funding and technology restraints.

The final section of this literature review addresses the infrastructure damage and mortality rates in Puerto Rico following hurricanes Irma and Maria in 2017. Researchers found the death rate that could be attributed to the hurricanes to be over 4,000 individuals (Kishore et al., 2018). They attributed many of these deaths to the interruption of health care services. Another alarming statistic Ficek (2018) describes is that there were areas without power for over 80 days, and there were industrial chemicals tainting the water supply in many areas. Vandermeer (2017) describes the devastation to the coffee industry which is a vital economic resource for Puerto Rico.

Utilizing Maslow’s hierarchy of needs theory (1943) and Hobfoll’s conservation of resources theory (1989) as a framework, this phenomenological study explored the results of a natural disaster on schooling and the characteristics that enabled students to attend school, as other basic needs were not met due to infrastructural interruption. The literature presented a gap on the effect on schooling a natural disaster had in a region. The literature presented a gap in that it focused on the negative cases in regard to schooling following a major disaster, such as decreased attendance and a higher dropout rate. This study focused on the positive cases which were the students that continued to attend classes and pursued their educational goals. With stress as one of the factors involved, this study focused on educators and students in Puerto Rico and their perspectives on the changes in schools following the hurricanes. This study also sought to understand why when so many people chose to leave the island, many students and teachers chose to stay.
CHAPTER THREE: METHODS

Overview

The purpose of this transcendental phenomenological study was to determine the characteristics of educators and students in higher education who persisted in their studies following Hurricanes Irma and Maria. The hurricanes destroyed most of the infrastructure in Puerto Rico in September 2017. I also explored the lived experiences of students and educators to determine why they chose to stay in Puerto Rico when many people would leave the island in the wake of the natural disaster. There have been studies on the effects of natural disasters on well-being due to stress or routine interruptions (Hamama-Raz, Palgi, Leshem, Ben-Ezra, & Lavenda, 2017; Phipps & Ozanne, 2017). The theoretical foundation for this study was based on Maslow’s (1943) hierarchy of needs theory and Hobfoll’s (1989) conservation of resources theory. Chapter three presents the research designs, research questions, the sites, participants, procedures, role of the researcher, data collection methods, data analysis, trustworthiness, and ethical considerations for this study.

Research Design

To address the research problem of this study, I chose to conduct qualitative research. Patton (2015) described qualitative research as “capturing stories to understand people’s perspectives and experiences” (p. 12). Creswell and Poth (2018) recommended a qualitative research study to be utilized when an issue needs to be explored and a “desire to empower individuals exists” (p. 45). Marshall and Rossman (2011) contended that qualitative research focuses on context and “views social phenomena holistically” (p. 2). Qualitative research was appropriate for this study because I will be exploring the experiences of students and educators in Puerto Rico. This study was also largely focused on their perspectives on how students were
able to overcome extreme difficulties and persist in attending school during the time following the hurricanes. It is my hope that this study will provide empowerment to these individuals to tell their story.

The research design for this study was a phenomenology. Phenomenological research was primarily developed by Husserl, a German mathematician (Creswell & Poth, 2018). Moustakas (1994) described the phenomenological approach as involving “a return to experience in order to obtain comprehensive descriptions” and to “determine what an experience means for the persons who have had the experience” (p. 12). Patton (2015) defined phenomenology as the “search of the essence of lived experience” (p. 115). This study focused on the lived experiences of students and educators. It offers comprehensive descriptions to their accomplishments in working towards their goals to obtain or provide an education.

Furthermore, I conducted this research as a transcendental phenomenology. Creswell and Poth (2018) describe transcendental phenomenology as dependent on the participants’ experiences and participants’ descriptions of their experiences, contrasted to hermeneutical phenomenology, where the researcher seeks to interpret the experiences. The participants of a transcendental phenomenological study must be aware of the study and intentional as they describe their experiences (Moustakas, 1994). This study was conducted as a transcendental phenomenological study, because the participants were asked to be intentional in describing their abilities and characteristics that enabled them to persist with their educational endeavors.

The data was analyzed utilizing Braun and Clarke’s (2006) thematic analysis. Also, Moustakas’s (1994) process was employed, which utilized epoche to set aside all assumptions, reduction to listen with a conscious intention of being open, imaginative variation which utilized the researcher’s imagination “to seek possible meanings,” and synthesis for the “integration of
the fundamental textural and structural descriptions into a unified statement of the essence of the experience” (p. 84-97). In my study, I collected data through interviews of students, a focus group of educators, and analyze a timeline created by all participants. From this data, I extracted themes from the participants’ statements and timelines. While there were some data points involved in this study such as days without power, the focus of this study was to understand the lived experiences of the students and educators more than just the data points.

Research Questions

The questions that guided this transcendental phenomenological study into the characteristics of students and educators who persisted with their educational endeavors are:

Central Research Question

What are educators’ and students’ perceptions of the characteristics necessary to persist with education in a difficult environment following a natural disaster?

Sub-Question One

How do educators and students describe the impact of Hurricanes Irma and Maria on their daily lives?

Sub-Question Two

How do educators and students describe the learning environment before and after Hurricanes Irma and Maria struck Puerto Rico?

Sub-Question Three

How do educators and students describe the importance of education?

Setting

The site for this study was a municipality in Puerto Rico that is located in the northern coastal valley called Terra Bonita (pseudonym). This area was chosen because the city is located
in an area that sustained a significant impact from the storms, including prolonged power, water, communication, and internet loss (Ficek, 2018). The city itself was without power for an entire year. According to the United States Census Bureau (2019), the city has a population of 169,000 people. This figure is an 18% decrease from the census conducted in 2010. The population is spread evenly among several age groups, but adults age 18 to 64 account for 60% of it. The population is 98.9% Latinx, with a White population of 68%. Education is important in the community, with over 80% of its population earning a high school diploma and 29% obtaining a bachelor’s degree. Poverty is a significant issue, with 35% of residents living in poverty and the median household income at just $26,000 per year. Homeownership is an important component of the residents’ lives. There is a 68% rate for owner-occupied housing units. The community hosts over 150 schools including: private, public, community colleges, and universities.

The area hosts so many educational institutions that students and faculty were ample for my research. The last and most important reason for me was an acquaintance who has lived in the community for many years and offered to be my gatekeeper in the community. The gatekeeper is an administrative assistant in one of the local educational institutions. She has acquaintances that teach and study at many of the nearby institutions.

**Participants**

A gatekeeper assisted me in recruiting volunteers for the study. The gatekeeper found participants that met the qualifications of the study. The gatekeeper had a questionnaire with the following yes or no questions to assist them: “Have you lived in this area since 2014?” “Are you at least 18 years old?” “Are you currently a student or educator?” “Did you continue to teach or attend classes during the year following Hurricane Maria?” “Will you be willing and available to assist with the validity criteria following this study?” The gatekeeper also ensured that the
participants have a reasonable ability to speak English. Most students have taken several years of English in Puerto Rico during school (Maldonado-Valentín, 2016). For me to effectively conduct the study, the focus groups and interviews were in English. I secured an English-Spanish translator from my school who assisted in the meetings. This translator is an official translator in the school district where I work. They translated difficult terms for the participants to ensure that we were all on the same page. I used snowball sampling, which is useful in “acquiring data from individuals associated with hard-to-reach populations” (TenHouten, 2017, p. 59). Once I found qualified participants both students and educators, I asked them to contact their friends that may also qualify for the study. Creswell and Poth (2018) suggested the use of purposeful maximal sampling that includes different perspectives on the problem, which is what I determined with participants. The participants in this study were selected by purposeful sampling which is necessary “to permit inquiry into and understanding of a phenomenon in-depth” (Patton, 2015, p. 52).

There were eight student participants selected that met the following criteria: they must have been living in Puerto Rico for at least three years prior to the hurricanes Irma and Maria and remained on the island following the hurricanes, they must be at least 18 years of age, taking classes currently, reside in an area that was significantly impacted by the hurricanes, were students for at least a year following the hurricanes, and be available for validity procedures following the data gathering process. The potential student participants were asked to complete a timeline, and the chosen student participants participated in an interview. There were five educators selected that met the following criteria: they must have been living in Puerto Rico for at least three years prior to the hurricanes Irma and Maria and remained on the island following the hurricanes, having taught in Puerto Rico for the last seven years, reside in an area that was
significantly impacted by the hurricanes, and be available for validity procedures following the
data gathering process. The educators were also be asked to complete a timeline and participated
in a focus group. I compensated participants for their time with a $50 Visa gift card upon their
completion.

Procedures

Creswell and Poth (2018) specified that at the beginning of the study, a researcher must
initiate contact with the site and participants, gain the initial consent from the site, and approach
participants to gain informed consent through forms that indicate this is a voluntary study the
participants will not be at risk for harm. Upon completion and acceptance of the proposal, I
contacted the Institutional Review Board for approval, which occurred prior to conducting the
study (Creswell & Poth, 2018). (See Appendix A for IRB approval letter.) Since the site is not a
particular school, but a community with many schools present, I will not need to gain site
approval. Once I secured the Institutional Review Board’s approval, the gatekeeper contacted
possible participants and utilized the IRB approved teacher and student recruitment scripts. (See
Appendix B for the IRB approved teacher recruitment script and Appendix C for the IRB
approved student recruitment script.) Participants responded favorably the gatekeeper, then
utilized the screening instrument to ensure they qualified for the study. (See Appendix D for the
IRB approved screening survey instrument.) Once qualified, the gatekeeper gave consent forms
to 20 students and 10 faculty members with the directions for a timeline and a template. (See
Appendix E for the IRB approved consent form for teacher participants and Appendix F for the
IRB approved consent form for student participants.) The gatekeeper also invited the students
and faculty members to encourage their friends to participate. The possible participants emailed
me the timelines and the consent forms to be considered for the study. Once I received the
timelines and forms, I began by conducting a pilot study of the interview questions with three students who were not involved with the study. I utilized the timelines to identify these students. (See Appendix G for the timeline activity template.) The students received a $20 Visa gift card for their time. From the remaining timelines, I chose eight student participants based on the following criteria: a minimum time without power, continued time attending school despite the infrastructural hardships, and the thoroughness that they employed in answering the open questions. The faculty members were chosen with similar criteria: a minimum time without power, the thoroughness of their open question answers, and a minimum of seven years in education at this point. Then I contacted my participants through email and scheduled Zoom interview times with the students and a Zoom time for my faculty focus group. The Zoom interviews involved me, the participant, and the translator and were audio and video recorded. The interviews were completed in English, but the translator helped ensure that words and phrases were properly understood by participants. (See Appendix H for the standardized interview questions.)

Following the interview process, I conducted a focus group discussion among the five educators and the translator through another Zoom meeting. This was also audio and video recorded. The focus group utilized the timelines again and discussed student answers that stood out as needing further clarification with educators that have been in the community. (See Appendix I for the standardized focus group questions.)

The Researcher’s Role

Patton (2015) asserts that the researcher is the primary instrument of inquiry in qualitative research and that a qualitative study is personal. This research is personal to me. My husband is of Puerto Rican descent and he has many relatives still residing in Puerto Rico. This
also affected my biases and assumptions during the study, one of which is my firm belief that all people deserve a voice. According to Patton (2015), “truth is a matter of consensus among informed and sophisticated constructors” (p. 123). Another bias that I have of the culture is that all Puerto Ricans are hardworking and resourceful. This led me to the assumption that students desire to attend school despite difficulties. Despite my biases, I wanted to be a truth seeker in this study. Patton (2015) explains that “qualitative designs are naturalistic to the extent that the research takes place in real-world settings and the researcher does not attempt to affect, control, or manipulate what is unfolding naturally” (p. 48). As the researcher, I did not want to manipulate what was unfolding, but view it without bias to get a better understanding of the perspectives of the participants in this study. I had no authority over the participants, gatekeeper, or translator. This helped them open-up to me about the situation and feel comfortable during the process. When analyzing the data, I utilized the process of bracketing to ensure that I set aside my biases and experiences to complete my study.

**Data Collection**

Patton (2015) asserts that in order “to increase the accuracy and credibility of findings,” research must include a triangulation of data collection methods (p. 106). Moustakas (1994) emphasizes that the evidence of phenomenological research comes from first-person reports. Triangulation of data is utilizing multiple data collection techniques and sources in order to validate research findings (Creswell & Poth, 2018). For triangulation of data to occur, I utilized the following three data collection methods: timelines completed by participants, semi-structured interviews, and focus groups. I began by collecting timelines. The timeline activity ensured the possible participants were qualified for the study and their willingness to be thorough in their explanations. Following the timelines, I conducted the semi-structured interviews with the
student participants. I was able to utilize some of the data from the interviews during my focus group with the faculty, which was my last data collection method, to gain further clarification.

**Timelines**

Monico, Ludwig, Lertch, and Mitchell (2020) describe timelines as being a tool to understand the experiences of participants. The researchers define timelines as “linear representations of time that place events in chronological order” (Monico et al., 2020, p. 2). Timelines are useful in both qualitative and quantitative data collection to provide reference points to aid recall during interviews (Rimkeviciene, O’Gorman, Hawgood & De Leo, 2016). Kolar, Ahmad, Chan, and Erickson (2015) found that timelines are useful in rapport building and having the participants as navigators to supplement the interview process. The timeline is similar to a journal activity, because participants were asked to write about memories during specific time periods.

For this study, the timeline included a template and instructions. (See Appendix G for participant timeline). I emailed the template, instructions, and the consent forms to the gatekeeper. The gatekeeper then emailed the participants a timeline, the instructions, and the consent form in order to enter the study. I had the potential participants email me the timelines and consent forms, and I utilized the timelines as part of the sampling process for participants and data collection. The timeline addressed the research question: “how do educators and students describe the impact of Hurricanes Irma and Maria on their daily lives?” The timeline also helped me identify participants that were more willing to share memories from the time period, which made them better candidates for the interview and focus group. The timeline instructions explained that participants should include any memories that they have for each timeframe that they would like to share. The timelines took participants about 20 minutes to
complete. The timeline began by asking about infrastructure items that the participants had readily available prior to the hurricanes. The timeline then instructed participants to write memories from various timeframes beginning with before the storms, during the storms, and several incremental time periods following the storms. The following milestones were a part of the prompt as well: "Please put specific memories of the first week following the storm?" “How long you were without power, water, telecommunications, and internet?” “When did things start to feel normal again?” “Please add any memories during the first year that you feel you would like to share?”

**Interviews**

The second data collection method that I utilized were semi-structured interviews with the student participants. Interviews are useful to understand participants’ point of view of their lived experiences (Creswell & Poth, 2018). Rubin and Rubin (2012) suggest the use of semi-structured interviews “when the researcher has a specific topic to learn about” (p. 30). Semi-structured interviews allow participants the ability to expound upon items that are important to them. With structured interviews, I would need to be rigid during the process and unstructured interviews allows free reign. However, with a semi-structured interview, I was able to keep the participants on topic through the questions but allow them to veer into additional items as they felt led to expound upon questions. The interviews were topical, I focused on specific facts or descriptions for a focused research question (Rubin & Rubin, 2012). Yin (2018) recommends asking “how” questions rather than “why” questions during the course of the interview to avoid creating a defensive environment. The interviews were conducted with the student participants via Zoom at a time that was convenient for the participants. The translator was also present during the interview. The interviews were conducted in English, but the translator was able to
assist with difficult phrases. The interviews were video recorded using the Zoom recording feature. I also audio recorded the interviews with my cellphone as a backup. I did not take notes during the interviews because I wanted to be completely focused on the participants. However, I did watch the recording of the interviews and took notes then for the analysis process. The interviews lasted about 30 minutes each. The interviews were transcribed through trint.com software. The interview and timeline data were analyzed for themes that were addressed during the focus group session with the faculty participants. I utilized the timelines during the interview to assist participants with recall (Rimkeviciene, O'Gorman, Hawgood, & De Leo, 2016). The interview questions for this phenomenological study are listed below:

1. Please state your name, age, year in school now, and year in school when the hurricanes hit.

2. Using your timeline as a reference, describe your recollection of the weeks following Hurricanes Irma and Maria?

3. What items were and were not accessible following the storms?

4. How long were you without each of those items?

5. Describe the impact of the hurricanes on your daily life.

6. How have your career goals been affected by the disaster?

7. Describe your emotions during that time?

8. Why did you and your family choose to stay in Puerto Rico?

9. List the technology available in your school before and after the hurricanes?

10. List what classes you were able to continue attending and what classes were canceled as a result of the hurricanes?

11. Describe your motivation for attending classes in that time frame?
12. What characteristics would you describe in yourself and your friends who continued attending school despite the hardships?

13. How is education important to you?

14. Will you please add anything else you’d like to tell me about your experience, even if it is something that I did not ask about?

The first question was to record demographic information and to ensure the participant meets the guidelines of the study. Question two was designed to understand the events following the hurricanes for the participants. The students also had their timelines to assist in recall of this time (Rimkeviciene et al., 2016). Questions three and four addressed the infrastructure loss for the students and the time frame of their loss. The infrastructure of Puerto Rico was severely damaged by the storms, with some areas experiencing power outages for over a year (Ficek, 2018). Question five asked students to assess the impact of the hurricanes on their daily lives. Torrence (2016) describes the resilience of a group following natural disasters. It was interesting to assess the students’ opinion of the impact of the hurricanes. Question six addressed students’ career aspirations. During some natural disasters, students are relegated to work in order to assist the families (Shah and Steinberg, 2017). Question seven was designed to understand the students’ stress and lower-level hierarchy issues as related to Hobfoll and Maslow (Hobfoll, 2001; Maslow, 1943). Question eight was designed to gain insight in each student’s reason for staying in Puerto Rico despite many families taking the opportunity to leave following the hurricanes (Llorens, 2018). Question nine addressed technology in the schools before and after the hurricanes. With the infrastructure damage, many technology items would be rendered useless to students (Ficek, 2018). Question ten addressed students’ ability to continue their studies, as some classes continued to meet while others did not (Ficek, 2018). Question 11
addressed the students’ motivation for continuing their studies which is important because according to Maslow (1943) the lower-level needs not being met would reduce or eliminate motivation to pursue the higher level needs. Question 12 gave students an opportunity to describe some of the characteristics that they believed assisted them in continuing their education despite previous studies showing that attendance is dramatically reduced following a natural disaster (Groppo & Kraehnert, 2017; Cook & Beachy, 2018). Question 13 addressed the idea that education is important to individuals for different reasons, but studies have shown that education can add to an individual’s well-being and happiness (Tan et al., 2020). Question 14 was a catch-all question that allows participants to discuss any items that they feel are important and I may have missed.

The interviews addressed the student portion of all the research questions. Questions 10-12 directly related to the central research question: what are educators’ and students’ perceptions of the characteristics necessary to persist with education in a difficult environment following a natural disaster? Questions 2-8 directly related to the sub-question: how do educators and students describe the impact of Hurricanes Irma and Maria on their daily lives? Questions 9-10 directly related to the sub-question: how do educators and students describe the learning environment before and after Hurricanes Irma and Maria struck Puerto Rico? Questions 11 and 13 directly related to the sub-question: how do educators and students describe the importance of education?

**Focus Group**

The final process of data collection was the focus group. Rubin and Rubin (2012) describe a focus group as a group of individuals who are representative of the population whose ideas are of interest. Krueger and Casey (2014) suggest a focus group should be conducted with
five to ten participants at a time who feel comfortable. The focus group in my study was conducted with five educators via Zoom at a time that was convenient for the participants. The translator was also present during the focus group. The focus group was conducted in English, but the translator was able to assist participants understanding difficult phrases. The focus group was video recorded using the Zoom recording feature. I also audio recorded the participants’ responses with my cell phone as a backup. I did not take notes during the focus group because I wanted to be completely focused on the participants. However, I did watch the recordings and took notes that were used in data analysis. The session lasted about 40 minutes. The focus group was transcribed through trint.com software. Focus group questions for this phenomenological study are listed below:

1. Will each of you please state your name, how many years you have in education, and what subjects you teach?
2. What characteristics did you see in students who persisted after the hurricanes?
3. What characteristics did you see in students who dropped out after the hurricanes?
4. What made you stay in Puerto Rico?
5. What curriculum adjustments did you make following the hurricanes?
6. Will you please describe the changes in the educational environment following the hurricanes?
7. What kind of emotional support did you receive after the hurricanes?
8. How did students’ interest level in education change following the hurricanes?

The first question was to record demographic information and to ensure the participant met the guidelines of the study. Questions two through three directly dealt with the focus of this research study by allowing educators to speak of differences they observed in students that were
able to persist in their education versus those that were not (Ferguson, 2018). Question four was designed to gain insight in the educators’ reasoning for staying in Puerto Rico despite many families who chose to leave following the hurricanes (Llorens, 2018). Question five dealt with the topic of curricular adjustments, which has been a trend for Puerto Rico’s education system over the last one hundred years (Maldonado-Valentin, 2016). Question six dealt with the changes since the hurricane as the education department had already planned some changes with the addition of more charter schools (Ferguson, 2018). Question seven addressed the need for emotional support that has been previously necessary due to possible post-traumatic stress disorder (Simmons & Douglas, 2018). Question eight related to the idea that students lacking resources and experience stress due to the lack of these resources may focus their attention on recouping the resources rather than seeking an education (Maslow, 1943; Hobfoll, 1989).

The focus group addressed the faculty portion of all of the research questions. Questions two and three directly related to the central research question: “what are educators’ and students’ perceptions of the characteristics necessary to persist with education in a difficult environment following a natural disaster?” Questions four related to the sub-question: how do educators and students describe the impact of Hurricanes Irma and Maria on their daily lives? Questions five and six directly related to the sub-question: “how do educators and students describe the learning environment before and after Hurricanes Irma and Maria struck Puerto Rico?” Questions eight directly related to the sub-question: “how do educators and students describe the importance of education?”

**Data Analysis**

Data analysis was conducted on all three collection methods: the timelines, interviews, and focus group. I utilized Braun and Clarke’s (2006) thematic analysis in order to facilitate this
process. Thematic analysis is “a method for identifying, analyzing, and reporting patterns (themes) within the data” (Braun & Clarke, 2006, p. 83). Themes are further described as “capturing something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set” (Braun & Clarke, 2006, p.87). The steps of thematic analysis are: familiarize yourself with the data, generate initial codes, search for themes, review themes, define and name themes, and produce the report (Braun & Clarke, 2006).

The timelines were completed before the student participants were accepted into the research study. I was first concerned with the thoroughness that the participants employed in filling out their timeline. This gave me an idea of which participants were particularly interested in sharing the story of their lived experiences. Barry (1997) recommends the use of timelines before interviews to code for themes that would be expanded upon during the interview stage. Following this advice, I began data analysis with the timelines, before the interviews and focus group were conducted. This allowed me to address any additional ideas during the interviews and focus group. The timelines were written in English and Spanish, and they could be completed in either language. Anything in the timelines in Spanish were translated into English by the translator. Barry (1997) suggests that timelines be analyzed by looking for emerging patterns and differences. Following this process, I took and combined the timelines into one large timeline. One item of interest was when different participants were able to recover their infrastructure items. Kolar, Ahmad, Chan, and Erickson (2015) assert that timelines should be coded for content and form, and researchers can also compare differences among participants. Following this process, the timelines were coded for similar experiences. I also looked for major
themes and when they occurred for the participants. I took the timelines and looked for subthemes that emerged.

Upon completion of the initial analysis stage for the timelines, I conducted the interviews and focus group. To prepare for data analysis, the interviews were transcribed through trint.com transcription software, and any phrases not in English were translated. The interview transcriptions were emailed to the participants for their review to assure validity (Creswell & Poth, 2018). Once the interviews were transcribed and translated, I read through the interviews and began data analysis. I utilized the following steps created by Rubin and Rubin (2012) to analyze the interviews. In order to facilitate this process, I began by taking the transcripts and adding them to a Microsoft Word document. I used the comment function in Microsoft Word to add my codes to the documents. Miles, Huberman, and Saldana (2014) offered the following: coding—assigning symbolic means to information compiled, generating pattern codes, jotting—commenting throughout transcripts using the Microsoft Word function of “comments,” and analytic memoing—a brief narrative that documents a researcher’s reflections during the data collection process. I coded excerpts that had relevant concepts and themes and looked across all interviews to summarize items that were coded similarly. I looked for symbolic meanings throughout the transcripts and I generated pattern codes as I looked for my themes. I sorted and compared the items across different subgroups and integrated textual descriptions to create a complete picture from the different interviewees. Creswell and Poth (2018) define textual descriptions as descriptions with specific examples of what occurred. Finally, I combined these descriptions and themes to learn about the lived experiences of the participants and ensured that the findings were generalized so they could apply to other settings.
I utilized the same steps created by Rubin and Rubin (2012) to analyze the focus group, and I also employed the advice of Krueger and Casey (2014), which is specific to focus groups. Krueger and Casey (2014) insist that before beginning the analysis process for a focus group, one must focus on the planning process to ensure good data is available by determining if some questions should be answered by everyone present and anticipating the discussion to consider probes that may be used. The focus group was video recorded via Zoom and a transcript was created through the transcription software was competed. With the transcription, I began the process of analyzing the data. The focus group results were analyzed by coding, which is “placing similar labels on similar things” (Krueger & Casey, 2014, p. 146), which put the comments into categories. Krueger and Casey (2014) offer the following items to use the concepts and prioritize the analytic themes: frequency, extensiveness, intensity, specificity, internal consistency, participant perception of importance.

**Trustworthiness**

Trustworthiness addresses credibility, dependability, transferability, and confirmability, four terms created by Lincoln and Guba (as cited in Crewell & Poth, 2018). Patton (2015) explains that triangulation is a term from land surveying, where one point is not enough to understand your location, and as a researcher utilizing multiple methods of data collection will strengthen the trustworthiness of a study. The triangulation of data was accomplished through the use of timelines, interviews, and focus groups as collection methods.

**Credibility**

the findings were reached and utilize concrete details to improve credibility. Creswell and Poth (2015) offer member checking, taking data and analysis back to the participants to judge for accuracy, as a way to increase the credibility of a study. During this study, I offered the participants the opportunity to review their transcripts and work as I formulated themes and trends from the data. I had the opportunity to engage the participants interested in following up with the study during the themes and trends formulation process. The translator is a district certified Spanish translator for my school district, which will also add credibility to the study. The use of a literature review also adds credibility to the study (Cohen & Morrison, 2018). To increase the credibility of this study, I utilized concrete details of the procedures, ensured the participants were available for member checks following the data collection process, remained engaged with the participants for a few weeks through the data collection process, utilized direct quotes from participants, and lastly exposed my possible biases and subjectivities.

**Dependability and Confirmability**

Cohen and Morrison (2018) define dependability as “consistency and replicability over time” (p.268). Miles, Huberman, and Saldana (2014) describe dependability as the quality and integrity of a study. The translator helped ensure that all terms were understood by the participants during the study. Creswell and Poth (2018) offer auditing of the research process as a way to increase dependability and confirmability. Cohen and Morrison (2018) suggest respondent validation to increase dependability. To increase dependability, I consistently adhered to the data collection methods and had participants available for the auditing process externally and internally. Triangulation of data also ensures the dependability of the study. In order to accomplish this, I analyzed the data from the timelines, interviews, and focus group to ensure they were consistent with one another.
Lincoln and Guba describe confirmability as the means to establish that data and interpretations were not the “figments of the inquirer’s imagination” (as cited in Patton, 2015, p. 685). Patton (2015) offers the advice to search for negative cases to improve trustworthiness. To increase the confirmability of my study, I searched for those negative cases in this instance differing opinions from the norm in my group of participants.

**Transferability**

Cohen and Morrison (2018) define the transferability of a study as not being “bound by the specificities of the particular study in question and must be able to apply to other situations” (p. 723). Creswell and Poth (2018) advise the researcher to create rich, thick descriptions so the reader can make decisions about the transferability of a particular study. To increase the transferability of the study, I provided rich descriptions in order that other readers and researchers can determine the transferability of my study to their situations.

**Ethical Considerations**

To address ethical considerations, I did the following procedures recommended by Creswell and Poth (2018): I found a gatekeeper that works and lives in the community to help get local participants. I submitted this study for IRB approval. I contacted potential participants sent by the gatekeeper to gain informed consent. I worked within the culture along with the gatekeeper to respect the Puerto Rican culture when discussing the study. I discussed the purpose of the study with the participants. When analyzing data, I bracketed out my biases in order to get the most accurate results from the study. I respected the privacy of the participants through the use of pseudonyms. I reported honestly and provided copies to the translator and participants of the final report and verified my findings. I also ensured the integrity of the data and privacy of
my participants through the use of password-protected video, audio, and word processing files. I will destroy the files after the completion of the study.

Summary

The purpose of this transcendental phenomenological study was to determine the characteristics of educators and students in education who persisted in their studies following Hurricanes Irma and Maria. The hurricanes destroyed most of the infrastructure in Puerto Rico in September 2017. While studies on natural disasters (Ho, Frankenberg, Sumantri, & Thomas, 2017; Lee, 2018; Moreno & Shaw, 2018; Vu & Noy, 2015), education and well-being (Jongbloed, 2018), and natural disasters and well-being (Hamama-Raz, Palgi, Leshem, Ben-Ezra, & Lavenda, 2017; Phipps & Ozanne, 2017) exist, there is little research that combines all three. This study will focus on the characteristics necessary for students to persist in higher education despite the natural disaster that occurred disrupting their daily lives.

This chapter focused on the research designs, research questions, the sites, participants, procedures, role of the researcher, data collection methods, data analysis, trustworthiness, and ethical considerations for this study. This study was completed in a community in Puerto Rico and involved seven students and five educators. The IRB approval was obtained before data collection. The data collection methods were timelines, interviews, and focus groups. The researcher was the primary instrument of analysis through coding, memoing, and summarizing the data. Particular attention was given to maintain the trustworthiness of the study including utilizing concrete details, providing rich descriptions, coordinating an auditing process, utilizing direct quotes from participants, and looking for negative cases or subjects that disagree with the other participants. To ensure ethical considerations were met, I password protected all related files, provided pseudonyms for the schools and participants, respected the cultural differences of
the participants, reported honestly, and provided copies of the study for the participants. In chapter four, I explore the findings of the study. In chapter five, I articulate the conclusion and implications of the study.
CHAPTER FOUR: FINDINGS

Overview

The purpose of this transcendental phenomenological study was to determine the characteristics of educators and students who persisted in their studies following Hurricanes Irma and Maria. With most of the infrastructure destroyed during the storms, participants were without power for months following the storms. Despite this, schools still opened to their students, even if they met in parking lots under tents to provide. The study’s theoretical frameworks were Maslow’s (1943) hierarchy of needs theory and Hobfoll’s (1989) conservation of resources theory. Chapter four presents the results of the study. The research questions guiding this study were:

CRQ1. What are educators’ and students’ perceptions of the characteristics necessary to persist in a difficult environment following a natural disaster?

SQ1. How do educators and students describe the impact of Hurricanes Irma and Maria on their daily lives?

SQ2. How do educators and students describe the learning environment before and after Hurricanes Irma and Maria struck Puerto Rico?

SQ3. How do educators and students describe the importance of higher education?

All participants completed a timeline journal before being admitted into the study. The timeline required participants to detail when infrastructure items were restored and other memories during different time frames for the year following the storms, approximately between September 2017 and September 2018. This activity was designed to help refresh the participants’ memory of the timeframe. It also ensured the participants qualified for the study based on their lack of consistent access to power and water for an extended period of time.
Eight student participants were chosen from the timelines received to be interviewed. Five faculty participants were chosen from the timelines received to be in a focus group. Due to travel restrictions in the wake of the COVID 19 outbreak in 2020-2021, the interviews and focus group for this study were conducted via the Zoom platform. The interviews and focus group were video and audio recorded through the Zoom software. The interviews and focus group were also audio recorded with my cell phone as a backup. The audio files were then uploaded and transcribed through Trint software.

I transcribed, read, coded, and identified themes while memoing on each of the three instruments completed by participants. The four themes found during data analysis are: need to socialize, continuing education, the desire to stay in Puerto Rico, and barrier to leaving. This chapter presents these findings. Then, the answers to the research questions are provided. Included in the results are participant quotations from the timelines, interviews, and focus group.

**Participants**

To maintain the confidentiality of the participants, pseudonyms were assigned to protect their identities. There were two groups of participants: students and faculty. All participants are Latinx and reside in Terra Bonita, Puerto Rico. All students were fluent in English, and all but one teacher was fluent in English. Frederica had limited English skills and communicated with the assistance of the translator. Spanish was the primary language for all participants. Age details were only collected from the student participants. Table 1 provides a detailed overview of the student participants in the study. Table 2 provides an overview of the faculty participants.
Table 1
Student Participant Information

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Gender</th>
<th>Age</th>
<th>Year in School During Hurricanes</th>
<th>Current Year in School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karla</td>
<td>F</td>
<td>19</td>
<td>10th Grade</td>
<td>Sophomore in College</td>
</tr>
<tr>
<td>Cristian</td>
<td>M</td>
<td>18</td>
<td>9th Grade</td>
<td>Sophomore in College</td>
</tr>
<tr>
<td>Jesus</td>
<td>M</td>
<td>19</td>
<td>11th Grade</td>
<td>Freshman in College</td>
</tr>
<tr>
<td>Sahari</td>
<td>F</td>
<td>18</td>
<td>10th Grade</td>
<td>Sophomore in College</td>
</tr>
<tr>
<td>Isaias</td>
<td>M</td>
<td>18</td>
<td>10th Grade</td>
<td>Sophomore in College</td>
</tr>
<tr>
<td>Josue</td>
<td>M</td>
<td>18</td>
<td>9th Grade</td>
<td>Freshman in College</td>
</tr>
<tr>
<td>Martin</td>
<td>M</td>
<td>19</td>
<td>11th Grade</td>
<td>Sophomore in College</td>
</tr>
<tr>
<td>Omar</td>
<td>M</td>
<td>19</td>
<td>10th Grade</td>
<td>Sophomore in College</td>
</tr>
</tbody>
</table>

Karla
Karla is a 19-year-old female and is currently a sophomore in college. Karla is studying to be a social worker. Karla is very involved with her local church. At the time of the hurricanes, Karla was in 10th grade. Karla described the Puerto Rican people as “trying to make the best of every moment,” and she really personified that attitude during her interview. Karla was happy and pleasant and so thrilled to help with the study. Karla emphasized that they spent a lot of time cleaning and helping their neighbors deal with all the debris from the storm, and she expressed frustration that many people needed help, but she was unable to provide it. Karla was without power for six months.
Cristian

Cristian is an 18-year-old male. Cristian is currently a sophomore in college, and he is studying to be a tool and die maker. At the time of the hurricanes, Cristian was in the ninth grade. Cristian was without power for seven months. Before the hurricanes one of Cristian’s favorite activities was playing video games. Cristian made an excellent participant, because he was very thorough in sharing his experiences through his timeline and the interview. Cristian described celebrating his birthday in March 2018 at a trampoline park, but he felt a bit guilty because there were still people with “blue tarps as roofs” during that time. Cristian did offer that his grades were impacted by the time he was unable to attend classes regularly, and his school day was reduced to just three hours a day from the date that school resumed following the hurricanes until Christmas break.

Jesus

Jesus is a 19-year-old male, and he is currently a freshman in college majoring in graphic design. At the time of the hurricanes, Jesus was in the 11th grade. Jesus was a bit shy during the interview, but it was obvious that he was passionate about sharing his story. Jesus lives in a very rural zone, so debris in the roads really hindered their ability to go and get things they needed. Jesus was without power for six months, and his school did not have power until January. The classes met inside and outside of the school for several months following the storms. Jesus did not have water at home until December, so they utilized a cistern of water. When asked why he and his family stayed in Puerto Rico following the storms he responded, “It’s just since we are living here, we’re going to suffer the same fate as everybody else on the island.”
**Sahari**

Sahari is an 18-year-old female, who is currently a sophomore in college majoring in finance. At the time of the hurricanes, Sahari was in 10th grade, and she was without power for four months. Sahari is very active in her church attending three days a week normally, and she enjoys spending her free time with her family. Sahari’s home was severely damaged during the storms, so her family stayed at her grandparents’ house until they were able to make the repairs. Sahari’s school resumed meeting for only two hours a day and they met inside the classrooms, and she described it as quite miserable because it was so hot and dark inside. Sahari turned 15 during the aftermath of the storms, and her *quinceanera* (the 15th birthday party for Latinx girls that acts as a coming out party) was delayed which disappointed her, because they had been planning it for a long time.

**Isaias**

Isaias is an 18-year-old male, who is currently a sophomore in college. Isaias is studying to be a social worker, and he loves sports and plays basketball. Isaias is very committed to his church attending three times a week. At the time of the hurricanes, Isaias was in the 10th grade, and he was without power for four months. Isaias’ grandparents live very close to him and he remains in Puerto Rico to be close to them. Isaias was offered a chance to go and study in North Carolina but chose to stay with his family, and he also felt that he was strong and fit and should stay so he could help his family and neighbors with issues they were facing. Isaias has a wonderful personality, and he even used the phrase, “I can’t help but chuckle,” when describing their times meeting at school under tents. Isaias also felt it was a blessing because he met neighbors he never knew existed.
Josue

Josue is an 18-year-old male, who is a freshman in college studying psychology. At the time of the hurricanes, Josue was in the ninth grade, and he was without power for five months. Josue is very committed to his church and spoke of God more than any of the participants, and he has a wonderfully upbeat personality. Josue dressed very professionally for the Zoom interview, which really impressed me. Josue did describe getting very frustrated with how long it took for the power to return. Josue’s family had a pool which they utilized for washing themselves for a few weeks following the storms. In answering the final prompt on the timeline to add anything else he would like to describe he wrote, “I had a very hard time and it was very scary, but it was definitely a learning experience. I learned to appreciate a lot of things.”

Martin

Martin is a 19-year-old male, who is currently a sophomore in college majoring in engineering. At the time of the hurricanes, Martin was in the 11th grade, and he was without power for seven months. Martin’s father is a police officer, so he worked a lot following the storms. Martin’s family was able to obtain gas easier because of his father’s position. Martin’s grandmother was being treated for cancer during this timeframe, so he was very stressed. Martin also says that he now suffers from anxiety, and he had several anxiety attacks during that timeframe. Martin was committed to continuing his education to be a good example for his younger sister. Martin also had the opportunity to leave and go to Pennsylvania but chose to stay.

Omar

Omar is a 19-year-old male, who is currently a sophomore in college. At the time of the hurricanes, Omar was in the 10th grade, and he was without power for eight months, because he lives in a rural area. Omar argued that they were fortunate, because there were people that he
knew that did not have power for a year. I believe Omar was nervous during the interview, because he kept walking around the house carrying his phone. Omar gave excellent answers despite this. Omar spent weeks with his family clearing debris with a machete to provide a passage to a river that they brought water from in order to flush the toilets, and he says that he actually picked up the skill of telling time by the sun’s location from working outside so much following the storms. Omar is currently studying to be a chiropractor, and he has always wanted to be some type of doctor ranging from ophthalmology to obstetrics.

Table 2

Faculty Participant Information

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Gender</th>
<th>Years in Education</th>
<th>Subjects Taught</th>
<th>School Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yari</td>
<td>F</td>
<td>7</td>
<td>Special Education</td>
<td>Public School</td>
</tr>
<tr>
<td>Alana</td>
<td>F</td>
<td>15</td>
<td>History</td>
<td>Private School</td>
</tr>
<tr>
<td>Federica</td>
<td>F</td>
<td>11</td>
<td>Physical Education</td>
<td>Public School</td>
</tr>
<tr>
<td>Ariel</td>
<td>F</td>
<td>18</td>
<td>Science</td>
<td>Private School</td>
</tr>
<tr>
<td>Iris</td>
<td>F</td>
<td>17</td>
<td>Chemistry</td>
<td>Private School</td>
</tr>
</tbody>
</table>

Yari

Yari is a special education teacher who works in a public high school. Yari just completed her master’s degree, so during the time after the hurricanes she was also attending school part-time. Yari has taught for seven years. Yari has always taught in Puerto Rico. Yari actually recorded some of the sounds during the storms, and she still has those recordings. Yari lives in a rural neighborhood, so after the storm she described the area as looking like it was burned. Yari’s family then went and stayed with her uncle for a few weeks, but it was eight months before their power was restored.
Alana

Alana is a history teacher who works in a private high school. Alana currently teaches Puerto Rican history to tenth graders, and she also is the Middle Years Program Coordinator at her school. Alana has a Masters in Arts in Teaching, and she has taught for 15 years. Alana has always taught in Puerto Rico. Alana has twin boys, which keeps her very busy. It was obvious that Alana really loves her school, and she was very proud of how the school handled the trials in the aftermath of the storm. “It was very much a team environment.” Alana felt that one of the benefits of the experience was that it strengthened them as a community, “We really came together as a community. Looking back now, we were kind of all in it together.”

Federica

Federica is a physical education teacher who works in a public high school, and she also assists at the education camp which is an afterschool program. Frederica has taught for 11 years. Frederica has always taught in Puerto Rico. Frederica has a son and a daughter. Frederica was very enthusiastic to help, and even recruited one of the other teachers. Frederica has limited English skills but was able to contribute to the focus group with the assistance of the translator. Frederica’s timeline was completed in Spanish and translated by the translator.

Ariel

Ariel is a science teacher who works in a private high school. Ariel has taught for 18 years. Ariel has taught in Puerto Rico and abroad during her years of teaching, but she insists that she would never want to live anywhere else again. Ariel also insisted that Puerto Ricans are particularly resilient because they have to be. Ariel is a single mother of two. During the storms, Ariel and her family went to her brother’s house. Following the storms, Ariel spent some time with her children sleeping in her classroom at school, so they could use the electricity. Because
Ariel lived near a hospital, the electricity was restored a little faster than in other areas but it still took four months. Ariel described teaching in the school library for a time with no power and just a whiteboard.

**Iris**

Iris is a science teacher who works in a private high school. Iris is also the Science Department Chairperson, and she has taught for 17 years. Iris has always taught in Puerto Rico. Iris’ husband works in the Puerto Rican Electric Company, so they felt it was his duty to stay in Puerto Rico and assist with the repairs. Iris described the aftermath of the storm as a time to fight, “I’m here and we got to fight this through.” Iris was very easy going, and she made it sound easy to adjust her curriculum and classes to fit their new situation, “we just figured out another way of doing it.”

**Results**

The focus of this study was to understand the characteristics that allowed students in Puerto Rico to continue their education despite tremendous hardships. This study also sought to understand the factors which caused the participants to choose to stay in Puerto Rico despite many residents fleeing the area. The data were collected utilizing the following instruments: timelines, interviews, and a focus group. All participants contributed a timeline. There were eight student participants interviewed and five faculty members participated in a focus group. The interviews and timelines were then transcribed. Then the three instruments were carefully read and analyzed. A codebook was created and utilized throughout data analysis. The codebook was used to keep track of code names and descriptions as well as inclusion and exclusion criteria. I then defined, organized, and interpreted the data collected. Lean coding was then employed to create 16 open-codes to be used to categorize the data.
Theme Development

Four themes and several sub-themes were identified from the data analysis of the participants’ timelines, interviews, and focus group. The themes were derived from open-codes from statements during the data collection processes. These codes emerged through Moustakas (1994) process of phenomenological research, which includes collection, analysis, and horizontalization. The open-codes, themes, and subthemes are presented in Table 3 below.

Table 3
Theme Development

<table>
<thead>
<tr>
<th>Open-Codes</th>
<th>Enumeration of open-code appearance across data sets</th>
<th>Themes</th>
<th>Subthemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boredom</td>
<td>6</td>
<td>Need to Socialize</td>
<td>Concern for One Another Need for Normalcy</td>
</tr>
<tr>
<td>Infrastructure Issues</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frustration</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schooling Offered</td>
<td>23</td>
<td>Continuing Education</td>
<td>Schools Pre and Post Hurricanes Future Career Plans Value of Education Characteristics of Persistent Students</td>
</tr>
<tr>
<td>Classes Attended</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career Goals</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Majors</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perseverance</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characteristics</td>
<td></td>
<td>Desire to Stay in Puerto Rico</td>
<td>Puerto Rico is their Home Sense of Community</td>
</tr>
<tr>
<td>Neighbors Assistance</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Pride</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English Skills</td>
<td>4</td>
<td>Barriers to Leaving</td>
<td></td>
</tr>
<tr>
<td>Jobs</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Need to Socialize

The first theme to emerge was the need to socialize. One sincere desire that came through from speaking with the students and faculty participants was their need to socialize with their
friends after the hurricanes. Schools are a community in themselves with many people spending more time at school than at home. With the infrastructure issues after the hurricanes, participants were only able to communicate with friends in person. Schools became an obvious meeting point for the participants. This issue provided the first sub-theme of the area: concern for one another. The second sub-theme to emerge was a desire to continue their previous daily routines. The students wanted the sense of normalcy that school can provide. The need to socialize was a primary answer to the central research question, “What are educators and students’ perceptions of the characteristics necessary to persist in a difficult environment following a natural disaster?”

**Concern for One Another**

A recurring problem that the students emphasized was that due to the lack of communication devices during that period; communication with friends was impossible except in person. The students were concerned that their friends could be hurt, have lost their homes, or lost loved ones. School facilitated this communication process since this was where they developed friendships before the hurricanes. Cristian stated, “I have some friends that I went to see in school,” when asked about why he attended school during the period. Karla expressed her concern for her friends’ well-being and how school offered the opportunity to check on them,

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I think that the principal reason that I wanted to go back to school is because I wanted to go back to society. I literally couldn't communicate with any of my friends. I usually got to see my friends and talk to them when we went to school. And I got to know that they were OK. We went to school because I didn't get to communicate with them due to the signal failing.
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Omar also reiterated this idea through his statement, “One was our friends, we wanted to see them. We went to see they were like, OK, because obviously we have no communication, we
kind of like see if they are alright or not.” Josue generally would go to school to see his friends, during the interview, he discussed the first time he heard a signal on his phone and how he immediately tried to contact his friends to check on them,

Again, I think I came to talk to my friends after Maria. . . I even remember where I was, I was walking through the neighborhood because we started getting signal all of a sudden and we were like, oh, my God. And then we started moving to see where the signal was close. And I remember I went to like this other house, like in the neighborhood. And then we got signal there. And then I checked up on all my friends. I was like writing to everybody, you know, checking up on everyone and was like, are you OK? Are you OK? Are you OK? And then there I learned that one of my friends lost his house.

Teachers were also concerned about the safety and well-being of their friends and other students. School offered the perfect meeting place for this group. The teachers found themselves very worried about the students’ safety, so when the students began coming back to school it was a great relief for them. They spoke of the relationships they had built with students, and how they recognized the students appreciated the relationships more following the storms. Ariel stated,

I think we started seeing the benefits of the relationships they had with their teachers prior to the hurricane and the storms, and I think that one of the things that led them to want to come back to school were those relationships.

Teachers were concerned for one another and their students, and students were similarly concerned. Schools are a community, because teachers and students spend the majority of their waking hours together in this environment. Maria referenced how the school gave people a place to come and be reunited, “I think the fact that the school opened up its doors to become like a meeting place, not just a school that was a huge emotional support for all of us.”
**Need for Normalcy**

A very important sub-theme to emerge from the data was the students’ need for normalcy. In order to properly address this, I want to look at the students’ daily lives before the hurricanes. The timeline activity began with two important contextual items address their life before the hurricanes: “what infrastructure items did the students have reliable access to and for them to tell me about their daily lives before the hurricanes.” Every participant stated that they had reliable services for internet, electricity, water, cell phone with good signal prior to the hurricanes. However, Omar clarified that he would lose power from time to time during storms because of the remote area where he lived, and Jesus said cell phone signal could be weak in certain spots. In their responses for their daily lives, Karla, Cristian, Sahari, Isaias, and Josue wrote that church was an integral part of their daily lives. Every student participant included a description of school as well. Furthermore, the students described, "hanging out" with friends, playing video games, and going out with their families as an important part of their daily lives.

For many students, school represents normalcy. Their ability to go to school brought them closer to their previous state and reminded them of less stressful times. Consequently, routine was found to be important for young people, and school becomes necessary for their routine. Many of the teacher participants agreed that routine and normalcy were important factors to improve students’ mental health. One student Josue described why he was so interested in going back to school as soon as possible,

I think it was to feel some sort of normalcy, like going to school or going back home chatting with your friends. I think our school really opened up to feel some kind of normalcy, to make the students feel like, OK, no matter what, you're going to get an education, you're going to feel at least somewhat normal. So, yeah, I think my motivation
was obviously to complete my education no matter what, and to feel some kind of normalcy, you know, actually get me up and make me do something because I wouldn't do anything the whole day. So it would actually give me something to do.

The lack of normalcy was very stressful for the participants. They yearned for life to get back to normal and they relied on their faith a great deal during this time. Josue spoke of his frustration with the longevity of the situation,

I think from the start of November, I started to really, like, lose it. I started getting distressed. I would see everybody getting their power back. And, you know, when you see everybody else getting their power back and you don't have power, it makes you go crazy. And every day I would wake up and I'd be like, then when this is going to be over, I used to pray at night. I'd be like, God, please make this stop. Please just help us, help me. I was emotionally drained. I was tired…. and just wondering when things would go back to normal, fearing that things will not go back to normal in a short time, you will have to wait longer.

It became a part of the teachers’ jobs to provide some normalcy for the students. Ariel spoke of the teachers’ desire to give this back to the students,

We kind of tried to jump back in pretty quickly to give the kids a sense of normalcy. I think we all felt that that was what we had to do, just continue to go and be gentle when we needed to be gentle.

The need for normalcy seemed to be a recurring theme from both groups of participants. Normalcy and routine could represent safety for young people, which is a lower level need according to Maslow. Attending school provided students with the routine which was comforting to them in the aftermath of such a tremendous disaster in their young lives.
Continuing Education

The second theme to emerge from the research was that of continuing education. Students and faculty members addressed many issues that referred to the importance of education. The sub-themes that emerged were schools pre and post hurricanes, future career plans, value of education, and the characteristics of persistent students. This theme related to sub-question two, “How do educators and students describe the learning environment before and after Hurricanes Irma and Maria struck Puerto Rico,” and sub-question three, “How do educators and students describe the importance of higher education?”

Schools Pre and Post Hurricanes

The student and faculty participants both discussed the schools pre and post hurricanes. One student, Karla, stated that computers were used regularly in class for just about two years before the hurricanes hit. Immediately after the hurricanes, the use of computers was impossible. All the participants confirmed that all of the core classes met, but the electives were canceled for a short time. For a time, some students were able to attend classes under tents outside of the school for a portion of the school day. Homework was dramatically reduced, because without power, students were working by candlelight after dark.

As schools were being rebuilt, technology was added. According to Sahari, “the school decided to invest in things like computers and laboratories, so we had more technology.” Another item added was more emotional support. As stated by Federica, “We worked on emotions to strengthen those and assist with emotional problems that they might have.” There were also more counselors available at the schools. Ariel spoke about foregoing uniforms due to the hardship of cleaning them; this helped the students feel more relaxed at school and more of a second home. Ariel’s school also incorporated more community service into the students’
expectations, to help the students understand the importance of giving back to the community that had helped them in challenging times. Alana discussed some small adjustments to the curriculum which added more geography and also more climatology. Lessons were added to address things like electricity as well, to capitalize on students’ new appreciation for the important infrastructure item.

**Future Career Plans**

Because some student participants were young, only 14 at the time of the hurricanes, their career plans were not necessarily decided upon before the hurricanes. In other cases, the students changed their career plans due to the circumstances; the disasters changed their desire for certain careers. One student Karla described her career change and the reason,

I guess knowing all the damage that went to other people and all the help they needed and couldn't have it and me not being able to give it to them, it was very frustrating. And it was a very important factor in me deciding to study social work and wanting to dedicate my life and to helping communities and giving help to people that need them.

Martin, however, decided to change career path because of the campus location he originally wished to attend with his major,

I wanted to study astronomy and end up in another campus of the university, but because of many disasters, the quakes, the hurricanes in that area . . . I decided not to study over there, and I changed completely my career from astronomy to engineering now. So, yeah, they were affected.

**Value of Education**

Students and teachers emphasized the value of education throughout the interviews and focus group. One of the teacher participants, Ariel, mentioned that the school invited the seniors
to come and assist with the cleaning and setup of the school, so students were able to return. They had large numbers of students participate. The seniors knew this was a critical time to be in school in order to deal with college applications and scholarships, so they were eager to do anything to help facilitate the cleaning and setup. Students also emphasized their desire to continue their education to finish on time with their classmates. The students continued to attend and maintain their classes so they could graduate and pursue their college degrees.

Students discussed the value of education during the interviews. They spoke about why education was so important to them as an individual. Three students, Martin, Josue and Sahari had profound quotes. Martin discussed how his parents emphasized the importance of education, to him in his quote,

Without education, you don't have anything. Oh, my dad and my mom had always told me that. A person can take everything from you but your education and the things that you have learned and experiences, they cannot take that away from you.

Earning advanced degrees was also important to the participants. Josue, who has aspirations of earning an advanced degree in college stated,

For me education is really important because it gives me security . . . so I know that if I study psychology and become a psychologist, then I know I'm going to have more job security because I actually went to college and got a degree and got a Ph.D. So education for me is really important.

Despite her youth, Sahari was very mature as she spoke of the importance of education and was proud of how hard she worked to obtain and continue her education,
It's very important for me, like many important people have said that knowledge is power. With knowledge, we can achieve many things. So my education for me is my first priority. I study in high school and now in university.

It was poignant to hear the passion in the students’ voices when they spoke of how education would impact their lives. The teachers all spoke of how education was important to the Puerto Rican people as a whole. It is a part of their culture. It was also obvious from the students that even though their families might be a driving force for them pursuing education, the students felt that education was an important facilitator for them to successfully make their way in the world.

*Characteristics of Persistent Students*

The central question of this study dealt exclusively with this particular theme: the characteristics of persistent students. I felt that it was important to begin by giving the students the chance to explain their feelings on what characteristics they and their persistent classmates possessed. Following the students quotes, I am offering the teachers’ opinions.

The students described many characteristics that enabled them and their friends to continue attending classes under such difficult circumstances. Many students seemed more emotional during this question than others. To me their pride in themselves and their classmates really came through as they discussed this topic. Martin described how happy he was that this terrible time gave his friends the opportunity to excel,

They were very brave. My friends, a couple of my friends lost their homes and still they have gone to school and they were very brave. I’m happy . . . the worst happiness, because Puerto Rico rose up and united. And all my friends were united, were brave and
admirable . . . and they were really helpful. From that time we help each other and it was
good to have them around.

Josue described the culture of his fellow students,

We always make the best of everything. We always make the best of every situation,
joking around, messing around. Like no matter what happened, we would go and chase
our dreams and chase our education no matter what. So I would say that we are a very
strong group of individuals.

The pride in her heritage is evident from Karla, who really personified the happy go lucky
attitude of the Puerto Rican people stated,

Well, I think that we Puerto Ricans and I say that we as people, we actually blast through
stuff. We just make jokes and look for the bright side and everything. We just all are very
silly and we persevere through the hardships and we always look for the best. We are
always, always reinventing ourselves and trying to make the best of every moment.

The teachers spoke about the students with an amazing amount of pride. They discussed
how students didn’t just make coming to school a priority but were also able to assist in making
it happen. Maria described the story of how the headmaster called on the high school seniors to
come in and help them clean the school and grounds, and the students volunteered in droves.
They did not just show up and continue their classes, but they came to help facilitate the process
of reopening the schools. Alana spoke of how the students were truly resilient, but they also
realized that their relationships with their teachers were also important to them,

The characteristics that I see in our students and I saw back then and I still see them, is
our students are very resilient and they are very motivated in general. And after the
hurricane in particular, I think we started seeing the benefits of the relationships they had
with their teachers prior to the hurricane and the storms. And I think that one of the things that led them to want to come back to school were those relationships and the fact that we really were everybody was going through it. None of us had power for months. None of us had access to things like gasoline, even things like groceries in the grocery store. So we kind of it was a very much a team environment.

Based on the data, the Puerto Ricans have a coping mechanism that they use to help them through difficult times; they are aware of the issues they may face. They understand that the government will not necessarily respond to an emergency, so they are prepared. Ariel spoke of how students were tough because they were accustomed to difficult times,

One thing that characterizes all Puerto Ricans that have lived in Puerto Rico and grown up in poverty, is that we are used to things not working. We are used to the electricity being unreliable. We are used to the government not helping us, really, which means that we do not count on those things in the aftermath of a hurricane. We know that as a community we need to come together and help each other out because we cannot rely on the government.

Ariel argued that the students of Puerto Rico were more resilient because they understood that they had to rely on themselves and one another. The teachers also argued that the culture put a great value on education which was instilled in their students. They also described the culture as “family-oriented.” The teachers were very proud of the culture of their people and especially of the culture of their students.

Desire to Stay in Puerto Rico

The third theme to emerge from the data was the desire to stay in Puerto Rico. The participants had strong ties to their homeland, and they did not wish to leave. The first sub-theme
to emerge was that Puerto Rico is their home. Regardless of the infrastructure damage, the participants felt that it was right for them to remain there. The second sub-theme to emerge was a sense of community. Neighbors banded together to assist one another with security issues, and they shared food and water with one another. Another highlight of their sense of community was the participants’ strong ties to their churches. This theme related to sub-question one, “How do educators and students describe the impact of Hurricanes Irma and Maria on their daily lives?”

**Puerto Rico is Their Home**

The participants were all adamant of their wish to remain in their home. Many of the student participants were offered opportunities to go and stay with relatives that lived abroad during the aftermath of the storms. Martin was offered the chance to leave but stated, “We were thinking about sending me to my grandma, but my grandma lives in Pennsylvania. But I couldn't bear to leave.”

Josue credited God with taking care of them and felt that it was not His will for them to move because there was still things to be accomplished in their communities,

I would like to say because God didn't want us to move, because I'm a firm believer that things happen for a reason. So maybe he didn't want us to move because there was still work to do here. So. Yeah, I think we stayed because there was still more to experience, there was still more to live and we knew that we were going to be all right, you know, after everything.

It could be debated that if someone never experiences life outside of their homeland, they may be reluctant to try something new. In contrast to this idea, Ariel offered her reasoning for staying.
In my case, I have lived outside of Puerto Rico for two years, and for me, there's nothing that can take me out of here. So it was all about just working through it and finding a way to get back to whatever normal we wanted to get back to.

Alana had spent much longer outside of Puerto Rico but agreed with Ariel,

I did go to college in the States and I lived outside of Puerto Rico for eight or nine years, but I never felt the way I feel when I'm here. So for me, it's not an option. The hurricane or no hurricane, we have to accept hurricanes as part of where we live and in this geographic location and also climate change. So it just wasn't an option.

Both women recognized that despite leaving their homeland for a time that Puerto Rico would always be their home. They intended to keep it that way, no matter the hardships that they may endure because of it. Their love for their island and their students was apparent during the focus group session.

### Sense of Community

The other sub-theme under the theme desire to stay in Puerto Rico that emerged was the sense of community among Puerto Ricans. The participants were very committed to their churches and their neighborhoods. Before the storms, many of the participants identified church as an integral part of their daily lives attending as many as three times per week. Their faith in God also assisted them in maintaining their positivity through the events. Yari stated, “I have never had the goal leaving Puerto Rico here, I have my family, friends, church and work.” Josue who is very active in his church, credited God with the strength to overcome,

But when I think about everything that I went through and how much I had to push through, honestly, it's something that I that I'm very proud of and something that I owe everything to God because he helped me through when I was distressed, when I was in
fear, like, honestly, my saving grace, it was it was him all the time. Like every time I thought it was going to lose it all, like he held me.

Karla who always looks at others around her and hopes to one day give back to the community stated,

I always say that I'm one of the lucky ones because thanks to God, I didn't have all that hardship. But there are so many people that died, so many people had lost everything, so many people that did not have the half of the things that I had.

While the church and God were important aspects of the participants’ commitment to their communities, they also discussed how their pride in Puerto Rico kept them firmly entranced in their homeland. Alana stated,

It just has never been an option, no matter what happens. And I think that a lot of us who are local to Puerto Rico are bullish about Puerto Rico. You know, we have a very strong sense of community and a home here. And honestly, we were used to things not always going our way in terms of government efficiency, power line, stuff like that. So the hurricane, yes, it was a terrible time and it was a big challenge, but it wasn't it didn't change anything from my perspective. As I said, I have family in the States and I have family here, but I don't want to live anywhere else.

The teacher participants also discussed how the community would rise up in times of need. This helped the people of Puerto Rico recognize that there were people there to assist them. Ariel discussed this and the need for schools to rise to the occasion and become the center of the community that students needed,

You've got groups of people that get organized and start reaching out. For me, for example, social media . . . was incredibly important because that's how I knew where I
could go to help or where I could go to get help. And it never in my case came from the
government at all. It was always some community outreach program that was developed.
So like open kitchens were placed in different areas that if you didn't have food, you
could just walk by or go and say, I have 15 people on my street, we don't have electricity,
and they would give you 15 plates of food so that they could eat. So I think that's what
allowed us to survive this whole thing.

The issue with the government also encouraged the citizens to work to take care of themselves.
Alana reiterated how the people of Puerto Rico always were self-reliant and family-oriented,

I think that we are very used to relying on ourselves, on each other. This is a very family-
oriented place. It's a very family-oriented culture. And one of the positive side effects of
having a government that does not work efficiently and never really has, at least in the
last 50 years, and is that we have learned to survive with each other. And that is the
difference. That is the reason our students came to us at the school. And it's not just the
school I have. We have friends that teach elsewhere. And it was the same thing. The
schools became a community center.

The participants also discussed their commitment to their communities. They were
committed to assisting their neighbors and received assistance from their neighbors throughout
the challenging times. Cristian in response to the question on his timeline to add anything he
would like to describe about the event reported,

I think this whole experience was bittersweet. We went through many hardships, but it
moved us to treat better and help those around us, and also have closer relationships with
family, friends, and neighbors.

Isaias on his timeline reported for the period of October to November 2017,
Little by little, neighbors and other folk began to hand out necessities, as did we whenever we got supplies from the US . . . I met neighbors I never knew existed, and all the kids would play basketball in the court. Ariel when asked to add anything on her timeline that she would like to describe reported, More than anything, our native sense of community is, in my opinion what helped us through the aftermath of hurricane Maria. Knowing that there were people willing and wanting to help gave us hope and helped us rebuild.

Community was emphasized by both faculty and student participants. Commitment to their churches, families, and neighbors was a recurring idea. The participants’ pride in their homeland remained in-tack despite the fact that they may have issues with their government’s responses to disasters, because they felt that as a people they would work hard to care for one another. This is an important aspect of community, the ability of a group to bond together during times of troubles.

**Barriers to Leaving**

Students and teachers addressed two barriers to leaving Puerto Rico during their interviews and focus group session. The first was employment. The fact that they were able to maintain their employment kept them on the island versus having to go and find jobs elsewhere. The second was the language barrier for non-English speakers.

Employment was a major concern for Puerto Ricans. If they were able to maintain their jobs, it was too risky to go to the mainland where employment was uncertain. Karla states, “And thanks to God, they didn't lose their jobs,” referring to her parents and why they chose to stay in Puerto Rico. Another issue with leaving was that family members had jobs that were in infrastructure repair or other essential services. Martin’s father is a police officer, so despite
being offered the personal opportunity to leave, he could not leave his father and mother. Iris also spoke of this in the focus group,

    OK, so in my instance, my husband works in the electric company in the Puerto Rican Electric Company. So for him it was his duty to stay here and to help out. So in my situation, it was never an option. It never came up. I did have the option to leave, but it was like a non-negotiable. It was like a no. Why would I leave? Like, I'm here and we got to fight this through.

    The English language was the second barrier for leaving Puerto Rico. One of the teachers, Federica admitted to struggling with English, “In my case, it has never been an option to move from my island, because of my family, also my command of English is quite limited.” Martin a student who was very proficient in English referred to his parents’ language issues, “The primary barrier was because my dad and my mom doesn't know English.” While all the student interviews were conducted in English with very little translation, many of the students referred to their parents’ lack of English skills.

    Many Puerto Ricans attempted to make new lives on the mainland, but were unsuccessful. At around eight months after the storms, Martin’s timeline reflected, “Around this time people who weren’t successful in the U.S came back.” Alana also referenced families leaving Puerto Rico but returning,

    So for a lot of families, it was just easier to pack up and go temporarily. And if they had that financial ability, they would do that. But then, as they said, they said most of those families ended up coming back unless they were not local to Puerto Rico.

Where so many people left the island for a time while there was no electricity, as they got word that the service was restored they chose to return.
Research Question Responses

For many months following Hurricanes Irma and Maria, the people of Puerto Rico were without power and reliable access to water, yet the student participants chose to pursue their education and the faculty participants maintained an educational environment for students to learn. The interviews, timelines, and focus group session yielded many interesting responses to the research questions. The faculty and student participants shared their ideas about the characteristics necessary to persist with education following a natural disaster, the impact of the Hurricanes Irma and Maria on their daily lives, the learning environment before and after the hurricanes in Puerto Rico, and the importance of higher education.

Central Research Question

The central research question was “What are educators’ and students’ perceptions of the characteristics necessary to persist in a difficult environment following a natural disaster?” The theme continuing education addressed this issue with the sub-theme characteristics of persistent students dealt exclusively with the central research question. The students and teachers both contributed to the answer to this central question. The students argued that the characteristics necessary to persist included bravery, helpfulness, happiness, and a desire “to chase their dreams” despite hardships. The teachers replied that students were resilient, relationship oriented, tough, and accustomed to hardships. The people of Puerto Rico are a resilient, strong, and fun-loving group. The students were able to persist with their schooling in a difficult environment following a natural disaster. These qualities all assisted them in doing that. They stayed the course in this difficult time, so they could pursue their dreams.
Sub-Question One

Sub-Question one was “How do educators and students describe the impact of Hurricanes Irma and Maria on their daily lives?” This question was addressed in the themes concerning the need to socialize and desire to stay in Puerto Rico. The participants described terrible hardships. All the participants had power loss from between four and seven months. Fresh water was an issue for on average two or more months for all participants as well. It was a terrible catastrophe that stressed them out and with some even led to post-traumatic stress disorder (PTSD), where the fear of a recurrence plague some of them today. Jesus on his timeline addressed this issue in response to the final area where he could add anything he wanted to describe,

I had never in my life experienced such a catastrophe. Seeing how our daily routines were drastically changed from one day to another really made me think and reflect on how natural disasters can happen any day, and that we are not fully prepared for catastrophes of this scale.

The participants also gained an appreciation of life before modern conveniences as Yari wrote on her timeline for the time frame of February through April 2018 that she had just gotten water back and this concluded the job of carrying water daily, “My cousins and I had the amazing experience of going to the well of water where our grandparents would go to look for water.”

Sub-Question Two

Sub-question two was “How do educators and students describe the learning environment before and after Hurricanes Irma and Maria struck Puerto Rico?” The theme that addressed this issue was continuing education with the sub-theme schools pre and post hurricanes. The participants addressed the addition of technology that had begun just two years before the hurricanes that was rendered useless due to the infrastructure issues. Immediately following the
hurricanes, schools dealt with the infrastructure issues by meeting for a few hours a day under tents in parking lots and in the classrooms and dealt with issues with heat and lack of working bathrooms. Schools also had to lessen the students’ loads for homework since the students would be working in the dark. After the infrastructure was repaired, the schools made investments in better technology. The curriculum was also adjusted to include more emotional development areas. The curriculum also was increased to utilize the students’ new appreciation for subjects like geography, climate change, and electricity.

**Sub-Question Three**

Sub-question three was “How do educators and students describe the importance of higher education?” This question was addressed with the theme continuing education and the sub-theme the value of education. The students felt that education was their key to security in the future, and that education was something that you could not lose. This is interesting considering the losses they suffered as a result of the hurricanes. They realized that education could not be washed away with a storm. The students also emphasized the value that was placed on education through their parents. They were taught to appreciate education at home. The teachers also reiterated that by discussing the education oriented culture that Puerto Rican families possess. The students realize that education is their way to better themselves and they owe it to their families and communities to pursue that.

**Summary**

The purpose of this transcendental phenomenological study was to determine the characteristics of educators and students who persisted in their studies following Hurricanes Irma and Maria. The participants lost power for four to seven months following the hurricanes, and they lost water for two to four months. Despite this, the teachers of Puerto Rico continued to
teach, even as they had to revise their curriculums and teach without technology during extremely limited hours and in difficult circumstances from libraries to tents in parking lots. The students of Puerto Rico attended these makeshift classrooms and continued to pursue their educations despite distractions at home from all of the extreme issues the families were facing. The students even contributed to the reopening of their schools.

There were eight student participants and five faculty participants involved in this study. The students ranged in age from 18 to 19 years old. There were two females and six male students. All of the students are currently attending college. The students spoke excellent English. The five faculty participants were all female. They had between 7- and 18-years’ experience teaching. There were two science teachers, and one each of physical education, special education, and history teachers. Three teachers worked in a private school and two teachers worked in a public school.

Four themes and eight sub-themes emerged from the data analysis. The themes were need to socialize, continuing education, desire to stay in Puerto Rico, and barriers to leaving. The need to socialize included the sub-themes: concern for others and the need for normalcy. Students and faculty participants were able to visit with friends at schools which assisted them in knowing they were ok. Routine and normalcy were an important item that students craved following the storms, and school was able to provide that. Continuing education included the sub-themes: schools pre and post hurricanes, future career plans, value of education, and characteristics of persistent students. Schools were improved following the hurricanes, because as they were rebuilding and replacing items, the technology increased. Some students adjusted their career plans due to campus locations and newfound desires to assist others. The value of education was instilled in students early on at home, and students believed that education was the key to a safe
and secure future. Persistent students were brave, admirable, helpful, happy, resilient, and accustomed to hardships. The desire to stay in Puerto Rico included the sub-themes: their home and sense of community. The participants emphasized their love and commitment for Puerto Rico. Where several had lived abroad and others had the chance to leave, they felt compelled to stay and fight through the hardships with their friends and families. Religion was an important part of many of the participant’s daily lives. They were committed to staying in order to assist their neighbors in surviving the hardships. The barriers to leaving were employment and English language skills. Participants and their family members had employment that kept them on the island. While all but one of my participants were fluent in English, many of their family members were not.

The central research question involved the perceptions of the characteristics necessary to persist in education following a natural disaster. The participants felt that they were brave, admirable, helpful, happy, willing to chase their dreams, resilient, tough, relationship-oriented, and accustomed to hardships. Sub-question dealt with how participant described the hurricanes impact on their daily lives. They described it as a “great catastrophe” that caused them to live for between four and seven months with very few modern conveniences. Sub-question two dealt with learning environment in Puerto Rico. While they were rebuilding and replacing, schools improved the technologies available to students and teachers. Schools also began to deal with students mental health issues. The curriculum was adjusted to tap into the students’ newfound curiosity about electricity and the geography of Puerto Rico.
CHAPTER FIVE: CONCLUSION

Overview

The purpose of this transcendental phenomenological study was to determine the characteristics of educators and students who persisted in their studies following Hurricanes Irma and Maria. Chapter five presents the results of the study. The chapter presents a discussion through an interpretation of the findings in the study, the summary of thematic findings, implications for policy and practice, theoretical and empirical implications, delimitations and limitations, recommendations for future research, and a conclusion of the entire study.

Discussion

Despite Maslow and Hobfoll’s assertions that students should not be following through with their educations in situations like this, they did so. The students should have been focused on obtaining the necessary resources to cover their basic physiological needs. However, the students of Puerto Rico overcame their difficulties to pursue education, which they felt was a valuable resource. The discussion section addresses the following areas: interpretation of findings, implication for policy, theoretical and empirical implications, limitations and delimitations, and recommendations for future research.

Interpretation of Findings

This section will explore the summary of thematic findings and the following interpretations of findings: the importance of family, the positivity of the people, and the need for community. There were extreme hardships the students of Puerto Rico faced as Isaias described cleaning a roof and looking at the mountains behind him, “There were fallen trees everywhere, it looked like an atomic bomb hit.” Despite this the students of Puerto Rico continued to pursue their education.
Summary of Thematic Findings

The following themes emerged from the data analysis of this phenomenological study: the need to socialize, continuing education, desire to stay in Puerto Rico, and barrier to leaving. The need to socialize included the sub-themes: concern for one another and the need for normalcy. The schools became a meeting place for all the participants. This added to their desire to attend school, so they could communicate with each other since cell phones were inoperable. Students also craved the normalcy and routine that school provides. This added the element of safety to their lives that was missing. The theme continuing education included the sub-themes: schools pre and post hurricanes, future career plans, value of education, and characteristics of persistent students. Where the schools had begun adding computers and other new technologies for the previous two years before the hurricanes, schools began implementing new technologies as they rebuilt and refurbished their schools following the hurricanes Students adjusted their career plans due to campus location issues and new desires that they embraced to assist others in their career choices. A recurring theme from the students and teachers was that education was incredibly valuable to the people of Puerto Rico. The culture of the Puerto Rican families was to embrace education. The characteristics of the persistent students included the following: resilience, strength, bravery, positive attitudes, and self-reliance. The third theme was a desire to stay in Puerto Rico and included the sub-themes: their home and sense of community. The participants emphasized that despite they may have had the option to leave Puerto Rico, they would not consider it because this was their home. Their commitment to Puerto Rico was evidenced throughout statements during their interviews and the focus group. Their pride in their island was evident. The sense of community is very strong in Puerto Rico. One issue with government corruption is that ensured that the community must care for themselves. The people
of Puerto Rico would step up to do this. The people were also very committed to their churches, which meant they had other micro-communities to depend on in hard times. The final theme: barriers to leaving involved the employment the participants or their families had in Puerto Rico or the limited English skills of the participants or their families.

**The Importance of Family.** The importance of family was a driving force for the participants to stay in Puerto Rico and also to continue with their studies. Many of the participants had the option to leave when daily life was challenging; however, they chose to stay and fight through it because of their love for their families. As Ariel stated, the Puerto Ricans are a very “family-oriented” culture. Also, the students worked hard at continuing their education, because they recognized the importance of education due to their familial beliefs. The people of Puerto Rico understand that higher education is a lifeline that their children can embrace to improve their situations. They want to give their children this opportunity, so they make getting an education a top priority. This attitude carries over to the students of Puerto Rico. They worked hard to continue their studies despite the other hardships they were facing.

**Positivity of the People.** The people of Puerto Rico have an innate happiness about them. They tend to see and make the best in every circumstance. All the participants referenced how their personal story of the hurricanes was less severe than others. They all referred to the time they were without and struggling as less severe than their neighbors. I think this uncomplaining attitude is a defining point for these people. Isaias stated that despite the hardships, they were able to gather and just sit and talk and eat with their neighbors, but that is because as Puerto Ricans, “they always find a good moment within the bad times.” They are happy regardless of the situation. They have a joy for life that is heartwarming. Listening to their stories upset me, because I felt so bad for them. At the same time they were smiling and happy. They thanked God
for taking care of them, and they recognized that whatever hardships they faced others had much worse circumstances than they had. Jesus described the people of Puerto Rico as having “a surviving spirit.” This reaffirmed what the literature

**Need for Community.** The Puerto Rican culture showed a strong need for community. The people in the communities learned to rely on one another. Llorens (2018) described the movement, “I will not quit on Puerto Rico,” which evidences the people’s commitment to their community. They were accustomed to a corrupt environment where they could not just depend on the government to care for them. The community would rise to that challenge. The participants were all involved heavily with their churches, and the churches also fed into their communities. Organizations came through to assist the people in the communities, and the people made it a point to volunteer to help manage those organizations. The students of Puerto Rico also bought into this attitude that if something needed to be done, they could do it as evidenced by Ariel’s experience “big groups of students started coming, signing up to help clean the school so that we could start school back again.”

**Implications for Policy**

This study yielded the following implications for policy: schools need to remain open to give students that sense of normalcy, universities and secondary schools need to find ways for students to become part of the school community, the need for educators to continue to be flexible, and the need for teachers to be prepared to assist students with traumas and disasters. Due to the need for normalcy that the students addressed, the schools should work especially diligently to remain open for students. During the 2020/2021 COVID pandemic, many schools were closed; this profoundly impacted students. The students have a strong need for normalcy as evidenced by this study; therefore, students will crave and fight for normalcy despite missing
many other physiological needs. The students of Puerto Rico desired to continue with their daily lives, so they could feel the security that normalcy provided. The students need that security today no matter the circumstances.

In the findings of this study, the sense of community that the schools were able to develop was also critical in assisting the students in persisting with their educations. Students were given a sense of community when afforded the opportunity to take ownership of their educational environment, as evidenced by the cleanup activities which involved them. Universities and secondary schools need to assist students to get involved through organizations and other community enrichment programs, so students will feel the ownership needed for their schools to enable them to persist in their educational endeavors.

The teachers of Puerto Rico showed their flexibility when they adjusted their curriculums, standards, teaching methods, and expectations to match the issues facing the students. The students today are facing many local and global issues. Teachers are having to rethink methods and procedures about educating students. This flexibility is one thing that makes the teaching profession so special. Educators have always needed a great deal of flexibility, and this is still true today. In an ideal world all students would come to school ready and excited to learn, because there would be nothing distracting them from this purpose. Unfortunately, distractions are inevitable. In the wake of COVID, students have had to quarantine and have been very sick, which has been a major disrupter of schools. Therefore, teachers must be extremely flexible.

The need for teachers to be prepared to assist students with traumas and disasters is another important implication for policy. Students today are facing traumas from natural disasters, COVID pandemic illnesses and familial losses, charged political environments, abuse,
violence, loss of loved ones, and many other issues. Teachers need preparation to assist students through these traumatic events and others. It is difficult for students to persist with their education when their emotional and mental health is suffering. The incorporation of trauma assistance in professional development for teachers will assist them in handling this extremely difficult issue for teachers.

**Theoretical and Empirical Implications**

Two theories formed the framework for this study: Maslow’s (1943) hierarchy of needs and Hobfoll’s (1989) conservation of resources theory. The literature available primarily focuses on retention rates and test scores, both of which have been negative following a natural disaster (Groppo & Kraehnert, 2017; Cook & Beachy, 2018; Nguyen & Minh Pham, 2018; Guilbert et al., 2015). Unlike the previous studies, this study focused on the positive cases where students did continue to pursue their educations and the characteristics that defined those students.

Maslow (1943) believed that human needs exited in a pyramid or hierarchy. The tiers from the lowest level to the highest are: physiological needs (air, water, food, and shelter), safety needs (personal security, employment, and health), love and belonging (friendship, intimacy, and family), esteem (respect, self-esteem, status, and freedom), and finally self-actualization (the desire to improve oneself) (Maslow, 1943). Maslow included physiological needs and safety needs as the bottom two tiers of his hierarchy. He emphasized that people had to have their lowest level needs met first, before the higher level needs would be considered by an individual. This theory was not viable for this study because the people of Puerto Rico are a contradiction of Maslow’s hierarchy. Even though love and belonging was the third tier of his hierarchy, the students had such an overwhelming desire to see their friends they were less concerned with their first and second tier needs. There are many instances in this study where students described
attending school this would place them in the third tier of Maslow's (1943) hierarchy. The students desired to see their friends, because they were concerned and missed them. Considering water was an issue during this time where there was enough to survive but not thrive, it does not make sense that the students would work so hard to fill this third tier issue without the first tier issue being met. I believe that because their friends were not safe and therefore their friends’ second tier needs may be unmet disturbed them so much that they put their friends’ possible needs above their own. I also believe that love and belonging are actually much more important needs for this particular group. Maslow’s theory put love and belonging on the third level, which means that it was contradicted in these circumstances.

The second issue that emerged from the data analysis was the desire by student participants for normalcy. School is such a major part of a young person’s routine, and young people crave routines. I believe that this is also a safety item for students. Therefore, it should be included in their safety needs which is a second tier need for Maslow. With school being open and students being able to go each day, the participants expressed this joy at having this normalcy returned. It made them feel safe and secure, and it also brought the reassurance that everything eventually would get better.

Hobfoll’s (1989) conservation of resources theory emphasized that people are stressed when resources are lost or could be potentially lost. During the timeframe following the hurricanes, stress was a terrible issue for the students. One student even had a mild case of PTSD where when the lights had recently gone off just for a few minutes he nearly had a panic attack thinking they would not come back on. I believe that stress did play a role in the students’ wishes to attend school. At that point in time, students felt helpless to contribute to their families’ resources, but higher education offered them a means to assist their families long-term. The
culture of the area asserted that education was a resource that could not be taken away. The students believed this, and they made sure to continue acquiring this precious resource. Karla’s quote illustrates this, “Education for me is everything, because without it, I have nothing.” Hobfoll's theory was viable as a framework in the study, because despite the amount of resources the students were lacking, education was also a resource from their perspectives and one that they endeavored to obtain.

There are minimal studies addressing this topic of schooling following a natural disaster. Previous studies regarding schooling and natural disasters have focused on the negative cases: the amount of students that dropped out of school and the learning lost for students that did continue attending classes (Groppo & Kraehnert, 2017; Guilbert et al., 2015; Nguyen & Minh Pham, 2018). The studies focused on the amount of students that are unable to pursue their education and the reasons behind this. Two such reasons are the household loss of assets and income and the families’ need for children’s labor to cope with the disasters (Cook and Beachy, 2018). Studies that deal with the positive cases as in this study are extremely rare. This study centers on the students that were able to persist with their education despite dealing with extreme hardships from loss of homes and family members. This study addressed a positive case where the students not only did not drop out, but they also successfully completed their high school degrees and are pursuing higher education. The students of Puerto Rico persevered in their studies through their strength of character. They believed that higher education was valuable for them to pursue despite the lack of other resources. Consequently, the empirical implications of this study is that it addresses a gap in the literature.

There were several studies that addressed the long-term impact of natural disasters, where the researchers looked at natural disasters that were from seven years prior to five hundred years
prior (Caruso, 2017; Vu & Noy, 2015; Lynham, Noy & Page, 2017). The disaster addressed in this study is still relatively young, therefore future studies could explore the long-term impact. The impact on well-being was well researched with many studies identifying improvements and decreases in personal well-being (Hamama-Raz et al., 2017; Lindahl et al., 2016; Adeagbo et al., 2016). One interesting study addressed how well-being could be predicted following a natural disaster by exploring an individual’s family connections (Hamama-Raz et al., 2017). The findings from my study have similar results as the students and faculty participants all had good family connections which led them to continue to pursue their dreams while dealing with the immediate consequences of the storms. Many of the participants’ families joined other families to pool their resources.

Psychiatric disorders were addressed in one study that found that 30 months following a natural disaster students’ psychiatric health showed improvement (Felix et al., 2011). My study concurred with the findings of Felix et al.’s study as most of the participants reported good mental health, and only one was now suffering with PTSD four years later. Conzo (2017) found that people were less willing to take risks following a natural disaster with prolonged disruptions to the daily routines. My study contradicted the findings of Conzo, as the participants depended on one another to survive the prolonged disruptions; they trusted one another more following the disasters than before. Studies have shown that stress impaired a learner’s ability to acquire new information (Kluen et al., 2017). My study did not directly address learning process, but found that students were able to overcome this obstacle enough to graduate from high school and begin college. Heersink, Peterson, and Jenkins (2017) argued that voters punished incumbent politicians following a natural disaster, and my study concurred as the participants blamed the government for their excessive hardships.
Limitations and Delimitations

The primary limitation of this study included the inability to conduct the research in person. Due to the COVID pandemic, travel to Puerto Rico was impossible. Fortunately, the technology industry responded well to the outbreak and there were many digital platforms to choose from to conduct the meetings. I chose the Zoom platform because it was user friendly for everyone involved and reasonably inexpensive. It also offered me the opportunity to record, and it has transcription features as well.

There were several delimitations in this study. The primary and secondary delimitations dealt with the location of the study. The third delimitation was the minimum age requirement of the student participants. The fourth delimitation was the minimum amount of teaching time for the faculty participants.

The first delimitation of the study was utilizing Puerto Rico for the setting even though natural disasters occur all over the world. I chose Puerto Rico due to my familial ties to the island and because of the abundance of coverage of the disaster. As I read articles about how students attended schools that had no power or water, all while dealing with issues at home, it occurred to me that this was a rather unique opportunity for research. I have often heard about how students basically disappear from schools following a natural disaster, but these students did not. They worked to continue their education. I wanted to understand the educational climate and the culture of the students in this exciting phenomenon. The articles that I read inspired me to study this.

The second delimitation of the study was the choice of Terra Bonita as the specific area within Puerto Rico to conduct the study. Terra Bonita offered an excellent setting for this particular study, because it had an abundance of educational institutions. The area sustained
significant impact from the storms, lost power and water for several months minimum up to a year in some places, had a population demographic and socioeconomic status that represented the island well, and hosted a family friend that acted as my gatekeeper.

The third delimitation was the minimum age requirement of 18 for the student participants. This ensured that consent forms only were required of the participants and not of the parents. This also meant that students were older when the disaster occurred. Utilizing younger students would not have yielded the true information that was required for this study. The students needed to be old enough to actively choose whether or not to attend school. A child that was only eight or nine at the time of the disaster would do whatever their parents insisted they do.

The fourth delimitation was the minimum amount of previous teaching experience for the faculty participants. I felt it was important to have teachers that were in the system for three years prior to the hurricanes, so they could adequately address the issue of changes within the schools following the storms. Without their previous experience, they would not be able to accurately compare the educational environment after the hurricanes to the one before them.

**Recommendations for Future Research**

Given the limitations and delimitations of this study, I would recommend several areas for future research. Further studies need to be conducted in areas following a natural disaster. Another study that needs to be conducted includes studying the effects on education following natural disasters or crisis in any region. Further studies need to be conducted on older students particularly college students. Studies to investigate strategies to assist students in self-regulating during a crisis to ensure they have the tools and the desire to continue their education also need to be conducted. Another study that utilizes the parents’ perspectives to explore their perceptions
of the students’ characteristics that allowed them to persist. Further research to explore other ways to improve the perception of education in communities should be conducted. There should be further research on how to define normalcy and how to ensure it.

**Conclusion**

The purpose of this transcendental phenomenological study was to determine the characteristics of educators and students who persisted in their studies following Hurricanes Irma and Maria. The theoretical framework of this study was Maslow’s (1943) hierarchy of needs and Hobfoll’s (1989) conservation of resources theories. This study challenged those long held theories, because students’ lower level needs were not met following the hurricanes, and they were under a tremendous amount of stress due to resource loss. The students were able to continue pursuing their studies, when they should have been unable to do so. There were 13 participants chosen to take part in the study from Terra Bonita, Puerto Rico: eight students and 5 teachers. All participants created a timeline. The students then participated in interviews and the teachers in a focus group. The data was coded and analyzed.

The study yielded four themes and eight sub-themes during data analysis. The themes were the need to socialize, continuing education, desire to stay in Puerto Rico, and barriers to leaving. The sub-themes were concern for one another, the need for normalcy, schools pre and post hurricanes, future career plans, value of education, characteristics of persistent students, their home, and sense of community. The students of Puerto Rico were resilient and took ownership in their educational endeavors as evidenced by their assisting schools to reopen by clearing debris. With the absence of communication devices, they were desperate to speak with their friends to ensure their safety, so they utilized their schools as a community center to meet in person. Their need for love and belonging eclipsed their lower level needs during this time.
frame. They relied on one another and their teachers. In the end, they were examples of how education can help a group following a natural disaster.
References


Appendices

Appendix A: IRB Approval Letter

June 15, 2021

Cyrenna Moreno
Susan Quindag


Dear Cyrenna Moreno, Susan Quindag:

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:101(b):

Category 2.(iii). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:

The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by §46.111(a)(7).

Your stamped consent form(s) and final versions of your study documents can be found under the Attachments tab within the Submission Details section of your study on Cayuse IRB. Your stamped consent form(s) should be copied and used to gain the consent of your research participants. If you plan to provide your consent information electronically, the contents of the attached consent document(s) should be made available without alteration.

Please note that this exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
Research Ethics Office
Appendix B: Teacher Recruitment Script

Hello Potential Faculty Participant,

A friend of mine and graduate student in the School of Education at Liberty University, Cyrenna Moreno, is conducting research as part of the requirements for a doctoral degree. The purpose of her research is to gain an understanding of the perceptions of the characteristics necessary for students to persist in their educational endeavors in a difficult environment following a natural disaster, and I am helping her to locate eligible participants to join her study.

Participants must have taught in Puerto Rico for the last seven years, reside in an area that was significantly affected by the hurricanes Maria and Irma, which hit the island in September 2017, and be available for validity purposes following the research. Participants, if willing, will be asked to complete a timeline journal activity (20 minutes) and a recorded focus group session (60 minutes). Names and other identifying information will be requested as part of this study, but the information will remain confidential.

Would you like to participate? [Yes] Great. [Gatekeeper asks screening questions.] [If criteria is met:] Could I get your email address so Cyrenna can contact you to send you the timeline journal activity and set up a time for an interview.   [No] I understand. Thank you for your time.

A consent document is provided as the first page of the timeline journal activity. The consent document contains additional information about Cyrenna’s research. If you choose to participate, you will need fill-out the timeline and submit it to her via email. If chosen to participate you will receive an email from Cyrenna with another copy of the consent form attached. You will need to sign the consent form and send it back to her via email. Doing so will indicate that you have read the consent information and would like to take part in the study.

Participants will receive a $50 Visa gift card for participating in the study.

Thank you for your time. Do you have any questions?
Appendix C: Student Recruitment Script

Hello Potential Student Participant,

A friend of mine and graduate student in the School of Education at Liberty University, Cyrenna Moreno, is conducting research as part of the requirements for a doctoral degree. The purpose of her research is to gain an understanding of the perceptions of the characteristics necessary for students to persist in their educational endeavors in a difficult environment following a natural disaster, and I am helping her to locate eligible participants to join her study.

Participants must be 18 or older, attended classes prior to September 2017 in Puerto Rico, continued attending classes for the year following September 2017, reside in an area that was significantly affected by the hurricanes Maria and Irma, and be available for validity purposes following the research. Participants, if willing, will be asked to complete a timeline journal activity (20 minutes) and a recorded interview (45 minutes). Names and other identifying information will be requested as part of this study, but the information will remain confidential.

Would you like to participate? [Yes] Great. [Gatekeeper asks screening questions.] [If criteria is met:] Could I get your email address so Cyrenna can contact you to send you the timeline journal activity and set up a time for an interview?  [No] I understand. Thank you for your time.

A consent document is provided as the first page of the timeline journal activity. The consent document contains additional information about Cyrenna’s research. If you choose to participate, you will need fill-out the timeline and submit it to her via email. If chosen to participate you will receive an email from Cyrenna with another copy of the consent form attached. You will need to sign the consent form and send it back to her via email. Doing so will indicate that you have read the consent information and would like to take part in the study.

Participants will receive a $50 Visa gift card for participating in the study.

Thank you for your time. Do you have any questions?
Appendix D: Screening Survey Instrument

Questions for Possible Student Participants:

1. Are you at least 18 years old?
2. Do you live in an area that was significantly affected by the hurricanes Maria and Irma in September 2017?
3. Were you attending classes in this area before September 2017?
4. Did you continue to attend classes during the year following September 2017?
5. Will you be available after the study for validating procedures?

Questions for Possible Faculty Participants:

1. Do you live in an area that was significantly affected by the hurricanes Maria and Irma in September 2017?
2. Have you taught in this area for at least the last seven years?
3. Did you continue to teach after the hurricanes despite the power outages and lack of resources?
4. Will you be available after the study for validating procedures?
Appendix E: IRB Approved Consent Form-Teacher Participants

Consent

**Title of the Project:** The Lived Experiences of Students and Faculty in High School and College Following a Natural Disaster: A Phenomenological Study  
**Principal Investigator:** Cyrenna L. Moreno, MS, Liberty University

---

**Invitation to be Part of a Research Study**
You are invited to participate in a research study. In order to participate, must have taught in Puerto Rico for the last seven years, reside in an area that was significantly affected by the hurricanes, and be available for validity purposes following the research. Taking part in this research project is voluntary.

Please take time to read this entire form and ask questions before deciding whether to take part in this research project.

---

**What is the study about and why is it being done?**
The purpose of the study is to document the lived experiences of students and educators that were working and studying in Puerto Rico during the year following Hurricanes Irma and Maria, which destroyed much of their infrastructure in September 2017. Despite the fact that this area was without power for over a year following the storms, students continued to attend classes and educators continued to teach them. This study will identify some of the characteristics that made this persistence possible for this group of people.

---

**What will happen if you take part in this study?**
If you agree to be in this study, I would ask you to do the following things:
1. Complete a timeline journaling activity which will take approximately 20 minutes.
2. Participate in a Zoom focus group session with other educators that will take approximately 60 minutes.

---

**How could you or others benefit from this study?**
Participants should not expect to receive a direct benefit from taking part in this study.

Benefits to society include a better understanding of the events following Hurricanes Irma and Maria and of the characteristics that help students persist in their education following a natural disaster.

---

**What risks might you experience from being in this study?**
The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

---

**How will personal information be protected?**
The records of this study will be kept private. Published reports will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records.

- Participant responses will be kept confidential through the use of pseudonyms. Focus Group will be conducted in a location where others will not easily overhear the conversation.
- Data will be stored on a password-locked computer and may be used in future presentations. After three years, all electronic records will be deleted.
- The focus group session will be recorded and transcribed. Recordings will be stored on a password locked computer for three years and then erased. Only the researcher will have access to these recordings.
- Confidentiality cannot be guaranteed in focus group settings. While discouraged, other members of the focus group may share what was discussed with persons outside of the group.

<table>
<thead>
<tr>
<th>How will you be compensated for being part of the study?</th>
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<tbody>
<tr>
<td>Participants will be compensated for participating in this study. You will receive a $50 Visa gift card that will be mailed to your home address following the focus group.</td>
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<tr>
<th>Is study participation voluntary?</th>
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<tr>
<td>Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.</td>
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<tr>
<th>What should you do if you decide to withdraw from the study?</th>
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<tr>
<td>If you choose to withdraw from the study, please contact the researcher at the email address/phone number included in the next paragraph. Should you choose to withdraw, data collected from you, apart from focus group data, will be destroyed immediately and will not be included in this study. Focus group data will not be destroyed, but your contributions to the focus group will not be included in the study if you choose to withdraw.</td>
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<tr>
<th>Whom do you contact if you have questions or concerns about the study?</th>
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<tr>
<td>The researcher conducting this study is Cyrenna Moreno. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at [redacted] or [redacted]. You may also contact the researcher’s faculty sponsor, Dr. Susan Quindag at [redacted].</td>
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<tr>
<th>Whom do you contact if you have questions about your rights as a research participant?</th>
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<tr>
<td>If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at [redacted].</td>
</tr>
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</table>

Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered
and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

<table>
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<tr>
<th>Your Consent</th>
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<tr>
<td>By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. You will be given a copy of this document for your records. The researcher will keep a copy with the study records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.</td>
</tr>
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</table>

*I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.*

☐ The researcher has my permission to video-record me as part of my participation in this study.

Printed Subject Name

____________________________________

Signature & Date

____________________________________
Appendix F: IRB Approved Consent Form-Student Participants

Consent

**Title of the Project:** The Lived Experiences of Students and Faculty in High School and College Following a Natural Disaster: A Phenomenological Study  
**Principal Investigator:** Cyrenna L. Moreno, MS, Liberty University

<table>
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<tbody>
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<td>You are invited to participate in a research study. In order to participate, you must be 18 or older, must have been attending classes prior to September 2017 in Puerto Rico, must have continued attending classes for the year following September 2017, reside in an area that was significantly affected by the hurricanes, and be available for validity purposes following the research. Taking part in this research project is voluntary.</td>
</tr>
</tbody>
</table>

Please take time to read this entire form and ask questions before deciding whether to take part in this research project.

<table>
<thead>
<tr>
<th>What is the study about and why is it being done?</th>
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<tbody>
<tr>
<td>The purpose of the study is to document the lived experiences of students and educators that were working and studying in Puerto Rico during the year following Hurricanes Irma and Maria, which destroyed much of their infrastructure in September 2017. Despite the fact that this area was without power for over a year following the storms, students continued to attend classes and educators continued to teach them. This study will identify some of the characteristics that made this persistence possible for this group of people.</td>
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<tr>
<th>What will happen if you take part in this study?</th>
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<tr>
<td>If you agree to be in this study, I would ask you to do the following things:</td>
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<tr>
<td>3. Complete a timeline journaling activity which will take approximately 20 minutes.</td>
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<tr>
<td>4. Complete a video recorded interview via Zoom which will take approximately 45 minutes.</td>
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<tr>
<th>How could you or others benefit from this study?</th>
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<tbody>
<tr>
<td>Participants should not expect to receive a direct benefit from taking part in this study.</td>
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</tbody>
</table>

Benefits to society include a better understanding of the events following Hurricanes Irma and Maria and of the characteristics that help students persist in their education following a natural disaster.

<table>
<thead>
<tr>
<th>What risks might you experience from being in this study?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How will personal information be protected?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The research team will protect all personal information collected in this study to ensure confidentiality and privacy. All data will be stored securely and will not be shared with third parties without your consent.</td>
</tr>
</tbody>
</table>

The records of this study will be kept private. Published reports will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records.

- Participant responses will be kept confidential through the use of pseudonyms. Interviews will be conducted in a location where others will not easily overhear the conversation.
- Data will be stored on a password-locked computer and may be used in future presentations. After three years, all electronic records will be deleted.
- Interviews will be recorded and transcribed. Recordings will be stored on a password-locked computer for three years and then erased. Only the researcher will have access to these recordings.

How will you be compensated for being part of the study?
Participants will be compensated for participating in this study. You will receive a $50 Visa gift card that will be mailed to your home address following the interview.

Is study participation voluntary?
Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

What should you do if you decide to withdraw from the study?
If you choose to withdraw from the study, please contact the researcher at the email address/phone number included in the next paragraph. Should you choose to withdraw, data collected from you, will be destroyed immediately and will not be included in this study.

Whom do you contact if you have questions or concerns about the study?
The researcher conducting this study is Cyrenna Moreno. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at [email protected] or [phone number]. You may also contact the researcher’s faculty sponsor, Dr. Susan Quindag at [email protected].

Whom do you contact if you have questions about your rights as a research participant?
If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu.

Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

Your Consent
By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. You will be given a copy of this document for your records. The researcher will keep a copy with the study records. If you have any questions about the
study after you sign this document, you can contact the study team using the information provided above.

*I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.*

☐ The researcher has my permission to video-record me as part of my participation in this study.

________________________________________
Printed Subject Name

________________________________________
Signature & Date
### Appendix G: Timeline Activity

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Hurricanes</td>
<td>I had reliable access to the following:</td>
<td>o Internet</td>
</tr>
<tr>
<td>Irma &amp; Maria</td>
<td></td>
<td>o Electricity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Cell Phone with Good Signal</td>
</tr>
<tr>
<td></td>
<td>Tell me a little about your daily life before the hurricanes.</td>
<td></td>
</tr>
<tr>
<td>During Hurricanes</td>
<td>Please describe any memories from the storms. Please tell me when you</td>
<td></td>
</tr>
<tr>
<td>Irma &amp; Maria</td>
<td>lost electricity, water, internet or cell phone signal.</td>
<td></td>
</tr>
<tr>
<td>(September 2017)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Week following</td>
<td>Please describe the first week following the storms. Please tell me</td>
<td></td>
</tr>
<tr>
<td>the hurricanes</td>
<td>how you obtained necessities like food and water.</td>
<td></td>
</tr>
<tr>
<td>(September 2017)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
October-November 2017

Please describe any memories of occurrences you have during this time period. Please add when items like electricity, water, internet or cell phone signal were restored.

December 2017-January 2018

Please describe any memories of occurrences you have during this time period. Please add when items like electricity, water, internet or cell phone signal were restored.

February-April 2018

Please describe any memories of occurrences you have during this time period. Please add when items like electricity, water, internet or cell phone signal were restored.
<table>
<thead>
<tr>
<th>Time Period</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>May-July 2018</td>
<td>Please describe any memories of occurrences you have during this time period. Please add when items like electricity, water, internet or cell phone signal were restored.</td>
</tr>
<tr>
<td>August-September 2018</td>
<td>Please describe any memories of occurrences you have during this time period. Please add when items like electricity, water, internet or cell phone signal were restored.</td>
</tr>
<tr>
<td>After September 2018</td>
<td>Please describe when you felt things were back to normal.</td>
</tr>
<tr>
<td>Any time Frame</td>
<td>Please feel free to add anything else you would like to describe about the event in this space.</td>
</tr>
</tbody>
</table>
Appendix H: Standardized Interview Questions

Interview Questions Instrument

1. Please state your name, age, year in school now, and year in school when the hurricanes hit.

2. Using your timeline as a reference, describe your recollection of the weeks following Hurricanes Irma and Maria?

3. What items were and were not accessible following the storms?

4. How long were you without each of those items?

5. Describe the impact of the hurricanes on your daily life.

6. How have your career goals been affected by the disaster?

7. Describe your emotions during that time?

8. Why did you and your family choose to stay in Puerto Rico?

9. List the technology available in your school before and after the hurricanes?

10. List what classes you were able to continue attending and what classes were canceled as a result of the hurricanes?

11. Describe your motivation for attending classes in that time frame?

12. What characteristics would you describe in yourself and your friends who continued attending school despite the hardships?

13. How is education important to you?

14. Will you please add anything else you’d like to tell me about your experience, even if it is something that I did not ask about?
Appendix I: Standardized Focus Group Questions

Focus Group Questions

1. Will each of you please state your name, how many years you have in education, and what subjects you teach?
2. What characteristics did you see in students who persisted after the hurricanes?
3. What characteristics did you see in students who dropped out after the hurricanes?
4. What made you stay in Puerto Rico?
5. What curriculum adjustments did you make following the hurricanes?
6. Will you please describe the changes in the educational environment following the hurricanes?
7. What kind of emotional support did you receive after the hurricanes?
8. How did students’ interest level in education change following the hurricanes?