

EXPERIENCE OF TEACHERS' LEARNING IN NATURAL DISASTERS: A CASE OF BAHAMAS

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Abstract: Using the Transformative Learning Theory lens, this qualitative case study examined the experiences of teachers as adult learners in the Northern Bahamas who taught before, during, and after a natural disaster. The initial findings of the ongoing study highlight the challenges faced by teachers during natural disasters, including disruptions to school infrastructure, limited access to resources, and heightened emotional stress. Despite these challenges, teachers demonstrated resilience by implementing adaptive strategies such as flexibility in class preparation, alternative teaching techniques, and collaboration with coworkers and community members. The emotional impact of natural disasters on teachers was also evident, with increased stress, anxiety, and burnout reported. Teachers emphasized the need for greater support systems and mental health resources to address these emotional challenges effectively. However, the study also revealed that teachers learned valuable lessons and experienced personal and professional growth through their experiences with natural disasters.

Keywords: transformative learning theory, Bahamas, natural disasters

Natural disasters are becoming more severe and frequent, exacting a staggering toll in terms of human and economic losses in recent years. Floods in Pakistan in 2010 killed nearly 2000 people, affected 20 million people, and submerged a fifth of the country (Thomas, 2017). In 2015, a heat wave in India killed 2,400 people, with temperatures averaging 40°C. Typhoon Ketsana hit Manila in September 2009, dumping more rain in a matter of hours than would typically fall in a month (Thomas, 2017). In January 2014, Jakarta was also hit by torrential rains, which brought the city to a halt. The recent earthquake in Turkey and the above occurrences are all evidence of climate change and its consequences (Hussain et al., 2019).

Climate change and natural disasters are confronting people worldwide. Thomas (2017) argued that no matter a country's advancement in education or economy, natural disasters impact every sphere of life, including the education sector and teaching and learning activities. Several studies have highlighted numerous challenges to teaching and learning in regions hit by natural disasters, such as limited access to bandwidth, physical conditions that are non-conducive for learning, and a lack of information technology infrastructure (Piryonesi & El-Diraby, 2021). However, Dahl and Millora (2016) argued that literature "on natural disasters has largely ignored individual learning and its consequences for school policy and programming" (p. 649). Therefore, our study aims to explore the impact of natural disasters on learning in disaster-prone regions from an adult

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learning perspective. We focused on teachers and administrators to better understand how they as adult learners make sense of the disruptions caused by natural disasters and how they navigate these disruptions. This study aims to contribute to the existing literature and help teachers and administrators be better prepared to deal with the impact of natural disasters on teaching and learning activities.

Literature Review

According to Dhal and Millora (2016) the study of natural disasters from an adult and lifelong learning perspective is a relatively new focus in educational literature. However, Norris and Murrell (1988)'s earlier study investigated the natural disaster impact on anxiety symptoms in older adults. Tsai (2001) investigated students' perspectives on earthquakes after a natural disaster struck Taiwan. Dhal and Millora (2016) studied lifelong learning from natural disasters especially in the context of Philippine.

There are several studies which focused on transformational aspects of natural disasters for adult learners (e.g., Chen et al., 2020; Choudhary et al., 2021; Sharpe, 2016; Thomas, 2017). Sharpe (2016) focused on transformational aspects of natural disasters. Similarly, Thomas (2017) explored economic transformation and policy change due to climate change and natural disasters. Chen et al. (2020) studied anxiety and resilience in face of natural disaster. Hussain et al. (2019) studied climate change impacts, adaptation, and mitigation in Pakistan. Manurung et al., (2020) focused on the perceptions of EFL learners in implementation of blended learning post natural disaster at a university in Indonesia. Hoffmann and Blecha's (2020)'s study showed that adults affected by natural disasters have increased learning motivation and are more open to learning new information and skills to help them manage and recover. Similarly, Choudhury et al. (2021) concentrated on transformational learning and resilience to shocks caused by natural disaster, in southern coastal Bangladesh. The researchers highlight the complicated interaction between transformative learning and resilience formed by social-cultural factors. Ruiz-Mallen et al. (2022)'s recent study specifically investigated the community climate. These studies offered insightful information about how people affected by disasters learn and transform.

Despite the growing body of literature on adult learning in the context of natural disasters and climate change, some gaps persist, presenting opportunities for further research. Current research has mainly concentrated on adult learners and communal transformational experiences. There is a need to explore educational context by focusing on viewpoints of other stakeholders like teachers, administrators, parents, community leaders, legislators, and non-governmental organizations. Our study specifically focused on teachers' learning experiences during and after natural disaster. We focused on teachers to better understand how they make sense of disruptions caused by a natural disaster and how they navigate these disruptions. We wanted to understand the transformational aspects of their learning process and learn how it impacted their teaching practices after experiencing a natural disaster.

Research Questions

1. What were the lived experiences of teachers during the natural disaster, and how did they make sense of their experiences as teachers during crises?
2. In what ways did teachers change their teaching practices during and after experiencing a natural disaster?

Theoretical Framework

We used Transformative Learning Theory (TLT) by Mezirow (1978, 1991) as a theoretical lens because we wanted to explore the process of learning and understand learning as a kind of meaning-making process after experiencing a natural disaster. These life altering experiences are often considered transformative since they can challenge previously held beliefs and values.

Mezirow (2000) defined transformational learning as the process by which the learner transforms their taken-for-granted frames of reference (meaning perspectives, habits of mind, mind sets) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove truer or be justified to guide action. Mezirow (1978) presented the following ten step transformation process.

- A disorienting dilemma
- A self-examination with feelings of guilt or shame
- A critical assessment of sociocultural, epistemic or psychic assumptions
- Recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change.
- Exploration of options for new roles, relationships, and actions
- Planning a course of action
- Acquisition of knowledge and skills for implementing one's plan
- Provisional testing of new roles
- Building of competence and self-confidence in new roles and relationships
- A reintegration into one's life based on conditions dictated by one's perspective.

However, Mezirow (1991) condensed the preceding ten steps into four major main components of the transformational learning process: (i) experience, (ii) critical reflection, (iii) reflective discourse, and (iv) action. The process begins with experience. According to Mezirow (1978), human beings have different experiences, and learning occurs from processing these experiences through critical reflection. This process helps the learners reflect on and examine their underlying assumptions and beliefs that influence the way they make sense of these experiences. Overall, TLT is a useful framework because it focuses on how learners construct meaning from their experiences and transform their values, beliefs, and behaviors based on these newly learned experiences.

Research Design

This study employed a qualitative case study as its research methodology. We used a qualitative research design for our study because it allows the researcher to explore research within the context of the research phenomenon (Yin, 2013). According to Creswell (2014), a qualitative research approach is used to explore and understand the meaning individuals or groups ascribe to a social or human issue. Creswell (2014) mentions several qualitative research designs. One approach is a case study. According to Glesne (2011), case studies can provide researchers with a chance to conduct in-depth analysis of a person, place, or phenomenon because cases are bound in terms of space and time.

Data Collection

Bahamas as Case Study

For data collection, we chose the Bahamas as our research site for our case study because it has experienced many natural disasters and is particularly vulnerable to the impacts of climate change. According to Inter-American Development Bank (2023) Bahamas is among the countries which are most prone to climate related natural disasters. The report mentioned that over the last 20 years Bahamas is impacted by 14 major disasters especially hurricanes which resulted in 50,000 individuals and incurred US\$ 6.7 billion in damages. By selecting the Bahamas as the research site, the study can examine the specific challenges and experiences of individuals and communities in this context. The country's geographic location and susceptibility to natural disasters make it an ideal case study for understanding the impact of these events on adult learning. Furthermore, the Bahamas has a diverse population with varying levels of education and occupation, allowing for a rich and nuanced exploration of the demographic factors that intersect with the experience of natural disasters and climate change. Choosing the Bahamas as the research site provides a unique opportunity to investigate the interplay between natural disasters, climate change, and adult learning within a specific geographic and socio-cultural context. Studying the Bahamas can generate valuable insights into the adaptive capacities, transformative learning processes, and behavioral changes of individuals and communities in the face of environmental challenges. The findings from this study can inform the development of targeted interventions and policies to enhance resilience and adaptive capacities in similar regions worldwide.

Sampling

The study used purposeful snowball sampling to gather data, as suggested by Grosseohme (2014). Purposeful snowball sampling is a non-probability sampling technique that involves identifying initial participants with the desired characteristics or experiences relevant to the research topic. These initial participants are then asked to refer, or snowball, additional participants who meet the inclusion criteria. The advantage of purposeful snowball sampling is that it allows researchers to reach individuals who have specific knowledge or experiences related to a phenomenon. The process of

purposeful snowball sampling involved identifying the initial participants, contacting, and recruiting the initial participants, and snowball referrals, and continued recruitment and saturation. Overall, using purposeful snowball sampling in this study allowed us to identify and include individuals who deeply understand the impact of natural disasters and climate change in the Bahamas. This sampling method facilitated the collection of rich and diverse perspectives, experiences, and knowledge that may not be easily accessible through other sampling techniques.

Participants

The study focused on the experiences of 10 teachers from the Northern Bahamas who taught before, during, and after a natural disaster. The eligibility criteria required the teachers to have direct teaching experience during all three phases. The study received approval from an Institutional Review Board (IRB) for the interview protocol, ensuring ethical considerations were met. Interested teachers in the Northern Bahamas were invited to participate in the study. Out of the 15 invited teachers, ten chose to participate, forming the final sample for the study. The participants were two male and eight female teachers and their age ranged from 30-49 years. All the teachers interviewed held a bachelor's degree or higher. They had teaching experience from 7-15 years at primary, secondary, or high school. The subjects they taught included English, Mathematics, Health Science, General Science, and Biology. The participants represented different regions of Bahamas such as New Province, Grand Bahama, and Long Island. All the participants were assigned pseudonyms for the study.

Interview

The interview is the most common source of data collection in qualitative research methodologies, especially in case studies (Yin, 2013). According to Bernard (2012), a researcher must conduct several interviews to obtain data for high-standard research. The researchers conducted semi-structured interviews for approximately one hour with each research participant. An Institutional Review Board (IRB) approved the interview protocol, and the researchers obtained the interviewee's consent before the interview process using the consent forms. All the interviews were conducted via Zoom during May and June 2023. During the interviews, the team of interviewers took notes to document the details and responses provided by the teachers. These notes captured vital points, quotes, observations, and relevant interview information.

Data Analysis

After the interviews were conducted, the research team transferred the recorded details from the interview notes onto a designated data sheet or template. Subsequently, the team uploaded the recorded details to a qualitative data analysis software called NVivo. NVivo is a commonly used software tool for managing, organizing, and analyzing qualitative data, allowing researchers to code, categorize, and explore patterns within the data (Røddesnes et al., 2019). Using NVivo, the research team can use the software's features to facilitate the analysis and interpretation of the collected data (Røddesnes et al., 2019).

It can support the team in identifying themes, conducting in-depth coding, and generating insights from the teachers' experiences and perspectives. The combination of note taking during interviews and subsequent data entry and analysis using NVivo demonstrates a systematic and rigorous approach to analyzing the qualitative data obtained from the interviews with the teachers.

Findings

Natural Disaster as Disorienting Dilemma

Teachers facing challenges during natural disasters, such as disruptions to infrastructure and limited resources, align with transformational learning theory. These disorienting dilemmas prompt teachers to reflect critically and adapt their teaching practices. Savannah shared challenges specifically related to teaching and learning and how she dealt with them.

You were there with dusty floors and no tiles. I did not have a chalkboard to write on or teach. So, I remember teaching long division on the basketball court... And then I went to Bellevue later that afternoon, and I asked for the same kind of paper that you printed the house plans on. Can give me some of that for me, please? and they were so nice they didn't even charge me... I put it up that same afternoon... I wrote some morning work on it just to test it out.

Savannah's experience exemplifies teachers' challenges in the aftermath of a natural disaster. She had to teach in unconventional settings without proper resources. She creatively used alternative materials and spaces to adapt, such as teaching long division on a basketball court and utilizing laminated paper as a white board. Savannah's experience demonstrates resilience and adaptability, exemplifying transformative learning as teachers engage in reflective thinking and problem-solving to overcome obstacles and continue providing education. This highlights the transformative nature of learning during times of crisis.

Emotional Impact and Teacher Well-being

Natural disasters have a significant emotional impact on teachers, leading to increased stress, anxiety, and burnout. Ashley shared:

Oh, man, that was a struggle that year for me personally. For me personally, it was a struggle because, you know, I had to mentally push on some days that I did not feel like I could push. There were days that I did not feel like coming to work. We just felt heavy. It just felt like a lot. And so, it was... it was a lot. And then, for students as well, try to motivate and encourage them. Sometimes I need motivation. I need encouragement. So, it was just a difficult, difficult year that specific year... But I will not dismiss the fact that it was a tough year for everybody.

Ashley not only mentioned her personal struggles but also pointed to collective hardship. Savannah said:

I would tell the Government to ease up if you allow me to say that. I say that because when a storm happens, they say, oh, we care about you and all of this. But then you expect the teachers to be right back in the classroom, performing at their maximum. And some of these people lost loved ones and their houses, and they need more time to get it together. So, I think I need to do a thorough assessment... if the teachers are not well, they will not teach because, as simple as it sounds... But I am saying that this shakes people right up. It affects everyone, even family members of people who do not live where it is happening. It affects them as strangers in foreign lands, hearing about what happened. It affects them in some way. So, for the person who actually went through it, you do not demand so much of them so soon.

Savannah raises concerns about the expectations placed on teachers immediately after a natural disaster, noting that teachers may need more time to recover emotionally and physically. She advocates for a thorough assessment of teachers' well-being and emphasizes natural disasters' significant emotional impact on individuals and their communities. This highlights the importance of considering teacher well-being and providing appropriate support during challenging times.

To address the emotional toll incurred by experiencing natural disasters, teachers stressed the need for greater support systems and mental health resources. Ashley said:

Teachers are people too. Teachers are people, too. It's important to factor in mental health days. We can't pour from empty cups. And so I would say that. You know, listen to the cries of the teachers who would need more mental health days to just catch themselves and give the students a better atmosphere for learning a better atmosphere for learning. And yeah, that's it.

Ashley's account highlights teachers' personal and collective struggles during natural disasters, emphasizing the need for greater support systems and mental health resources. She emphasizes addressing teachers' mental health needs and creating a supportive environment for teachers and students to thrive.

The theme of emotional impact and teacher well-being aligns with transformative learning theory, as natural disasters serve as disorienting dilemmas, prompting teachers to reassess their beliefs and values. The emotional toll experienced by teachers highlights the need for self-care and support systems. Their reflections and advocacy for change demonstrate critical reflection and dialogue, contributing to personal and professional growth. This theme underscores how natural disasters can catalyze transformative learning by challenging existing perspectives and promoting the recognition of teachers' well-being as integral to effective education.

Adaptation and Resilience Strategies

The theme of adaptation and resilience strategies aligns with transformational learning theory as it highlights the transformative process that occurs when teachers navigate and overcome challenges. Teachers' ability to adapt their approaches, seek collaboration, and find alternative ways to engage students reflects a shift in their thinking and practice.

Melanie said:

...collaborating more with teachers. You may have to come out of your comfort zone. So you go and, you know, ask for help.

Isabel said:

I would not say relax, but they want us to focus, as they should. because of what they had going on, you had to find different ways to engage them. We had to find different ways to help motivate and encourage them. Whether it was, you know, throughout a lesson, or maybe one lesson, or one day, you just sit down and talked to them.

By embracing new strategies and stepping out of their comfort zones, teachers demonstrate transformative learning by expanding their capabilities and finding innovative solutions to address the unique circumstances brought about by natural disasters. This theme emphasizes the importance of continuous learning and growth in adversity, key aspects of transformational learning theory.

Lessons Learned and Professional Growth

Teachers identified valuable lessons from their experiences with natural disasters, such as the importance of emergency preparedness and building resilient school communities. Many teachers reported personal and professional growth, citing increased adaptability, problem-solving skills, and a greater appreciation for the role of education in disaster recovery and resilience-building. Natalia said:

Hurricane Dorian has drawn more attention and caused me to focus a little bit more on adaptability. A lot of times, as educators, you get caught in the rhythm of teaching. And what your norm has become. We don't always think about making modifications, but I think it proves that if you do divert from the curriculum, if you do stray away for whatever those reasons are, perhaps you need a little bit more differentiation of instructions. You need to review a concept as opposed to moving forward. It has proven that sometimes you can pause to accommodate learning or cater to children more and then continue to progress because we were forced to do it with Dorian. Yet still, the children learned. The children were prepared for the national examinations.

Melanie also shared:

You know you want to keep in contact with people in case you need help. You also develop a better relationship with your parents, so you can communicate with them when school is closed.

Natalia's experience during Hurricane Dorian led to lessons in adaptability and the importance of making modifications in teaching. She realized the value of pausing to accommodate learning and saw that students could progress despite disruptions.

Melanie's experience highlighted the significance of maintaining communication with others for support during crises, particularly with parents. This experience emphasized building relationships and effective communication channels in challenging times.

Discussion

This study explored teachers' experiences in the Bahamas before, during, and after natural disasters. This study contributes to the existing literature by exploring teachers' experiences in the Bahamas, a region prone to natural disasters. The preliminary findings align with theoretical perspectives on transformative learning, as teachers mentioned feeling disoriented after experiencing a natural disaster. However, they adapted to new circumstances and demonstrated resilience. The study also shows shifts in their worldviews, self-concepts, and capacity-building in response to the challenges faced. This study adds to the growing body of research on the impact of disasters on education and highlights the unique context of the Bahamas. The preliminary findings also emphasize the importance of teacher support systems during and after natural disasters. Providing teachers with adequate resources, training, and mental health support can enhance their ability to cope with the emotional toll of such events and foster their overall well-being. Additionally, the identified adaptive strategies employed by teachers during natural disasters provide valuable insights for teacher training programs, highlighting the need for ongoing professional development that equips educators with the skills and knowledge to navigate challenging circumstances.

Overall, this study highlights the critical role of teachers in the face of natural disasters and underscores the need for continued support, preparedness, and resilience-building efforts. By addressing the challenges identified and implementing recommendations derived from this research, educational institutions and policymakers can work towards creating a more resilient and adaptive educational system that ensures continuity of education even in the most challenging circumstances.

Limitations

While this study provides valuable insights, there are limitations to consider. The small sample size and focus on a specific geographical area restrict the generalizability of the findings. Future research could expand the scope by including a more extensive and diverse sample, examining long-term effects, and exploring the effectiveness of specific intervention strategies.

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