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Latinas' Reinvention as STEM College Students in Pandemic Times at a Hispanic-Serving Institution

Hilda Cecilia Contreras Aguirre
New Mexico State University, USA

ABSTRACT

This study explores the challenges Latina students pursuing Science, Technology, Engineering, and Mathematics (STEM) faced during the pandemic and how they overcame such problems with resilience. This qualitative study focused on seven Latina college students at a Hispanic Southern border institution (HSI). The research methods included interviews, observations, and document analysis to explore their experiences. The findings reveal that there were various strategies employed to cope with the new online academic requirements, maintain their mental well-being, and stay connected with their family and colleagues. The study emphasizes the importance of faculty training in online teaching and the need for faculty and administrators to be flexible in understanding post-pandemic on-campus life for students.

Keywords: Latinas, Mental well-being, Peer support, Post-pandemic life, Resilience, STEM, Virtual learning.

INTRODUCTION

During the COVID-19 pandemic, college students faced increasing challenges due to disrupted learning structures. As a result, they had to quickly adapt to a new form of academic instruction and develop new strategies and techniques to persist in their studies. As an underrepresented student population, Latinas pursuing STEM degrees call for investigating the preparation and skills they use to alleviate academic, financial, and emotional challenges. Latinas in STEM programs remain highly underrepresented. According to the National Center for Science and Engineering Statistics (NCSES) (2021), Latinas attained 2.10% of Computer Science degrees in 2018. They also achieved 2.85% in Engineering, 4.82% in Mathematics and Statistics, and 4.83% in Physical Sciences. Despite the college degree attainment, the enrollment of women of color has increased disproportionally to the number of students attaining bachelor's degrees, especially in STEM (NCSES, 2023; National Science Foundation [NSF], 2017).

The stress and mental health issues caused by the pandemic have seriously affected college students in different aspects of their lives, particularly in their lack of motivation to stay focused on college responsibilities (Albelbisi & Yusop, 2019; Aguilera-Hermida, 2020). Increased stress levels have been greater for borderland communities historically suffering from socioeconomic disadvantages and financial limitations (Scutti, 2020). The Hispanic-serving institution (HSI) is in a borderland area where racial, social, and economic inequalities are commonly experienced by people living in the community. Studies have shown that Latinas' resilience is crucial for success as STEM college students, due to the multiple disadvantages they face in and out of classrooms and on college campuses (González & Wilson, 2020; National Girls Collaborative Project, 2021). Latinas also reported that self-determination and self-esteem are significant factors in adapting to STEM degree programs (Venegas & Espinoza-Wade, 2020). In addition, the reinforcement of a strong science identity, the adoption of leadership skills, and the involvement in mentoring practices are strategies employed by resilient Latinas (Contreras Aguirre & Banda, 2019; Verdin & Godwin, 2018).

During the COVID-19 pandemic, the lack of additional support provided by institutions, especially by HSIs, for minoritized students such as Latinas highlights the urgent need to study distinct factors that contribute to their success as college students (Hispanic Association of Colleges and Universities (HACU), 2020; National Girls Collaborative Project, 2021). These study findings could also reflect the experiences of other minoritized students who have struggled to adapt to college life and are seeking to learn good practices implemented by their peers.

Purpose of the Study

The purpose of this study is to capture the stories of a selected group of Latina STEM students, including the ongoing difficulties they faced due to the pandemic and their acts of strength and resilience in overcoming these issues. As a minority group in STEM academic programs, Latina STEM college students' underrepresentation is often linked to gender issues, making both aspects interconnected.

Research Question

What major acts of resilience have Latina STEM college students engaged in during the COVID-19 pandemic?

LITERATURE REVIEW

Latinas in STEM Programs at HSIs

Latinas represent 30 million, or 18.1%, of the female population in the United States, with 34% in the 0-19 age range (United States Census Bureau, 2019). Therefore, many Latinas are currently school-aged and entering college. In terms of college enrollment, Latina students' enrollment has increased in the last 20 years; however, they remain highly underrepresented in some STEM disciplines (American Association of University Women [AAUW], 2019). For example, in engineering, 4,582 Latinas were enrolled as full-time, first-year students out of 133,005 students (NCSES, 2018). The mismatch between the number of Latinas expressing a desire to pursue STEM disciplines and those who enter STEM degree programs warrants immediate attention from researchers. This includes considering cultural factors and interventions to foster resiliency for Latinas seeking STEM careers. Prior scholarship has repeatedly shown that Latinas face considerable and varied barriers to entering STEM majors and fields, especially compared to males pursuing STEM degrees (Contreras Aguirre, 2019; National Girls Collaborative Project, 2021; O'Brien et al., 2015). Scholars have documented a continued lack of support in higher education directly influencing minority degree attainment (Villa et al., 2016). This includes: 1) lack of funding for institutions that mostly enroll Latinx students; 2) limited supportive spaces that reinforce students' sense of belonging; and 3) insufficient informal and formal STEM learning environments (HACU, 2020; National Girls Collaborative Project, 2021). HSIs are diverse in student demographics, structure, type, funding, governance, and Carnegie classification (García, 2019b). Consequently, it is difficult to find a single approach that appropriately serves Latinx students across HSIs (García, 2019b). In 2022, 15.6% of all STEM college degrees were conferred to

Latinos, with half of those degrees awarded to Latinas. There was a 6% increase in Latina STEM degree achievement from 2013 to 2022 (NCSES, 2023). In terms of employment, "6.42 percent of STEM employees identified as Hispanic/Latina," a low percentage compared to the 66% of White women in STEM-related positions (US Equal Employment Opportunity Commission, 2019). There is a strong relationship between the success of Latinas and that of the nation in terms of population representation and critical support for the U.S. economy, despite facing educational, health, and economic inequities (AAUW, 2019). This makes it critical to study Latina students at the college level and their role in disciplines of national interest.

The Resilience of Latinas Because of Community Strength

The Latino population, characterized by a determination to succeed, strong loyalty to family and community, and pride in its roots and legacy, has faced the havoc of social and economic inequalities in a country that exalts Whiteness over any other skin color (Contreras Aguirre, 2019; García, 2019a). The role of People of Color in increasing the numbers of higher education enrollment is perceived as positive for integrating them into the workforce (Martinez & Gayfield, 2019). Despite this positive trend, Latinas' low college attainment numbers in STEM are often blamed on their academic performance or lack thereof, rather than on the educational system. Often, Latinas' low retention numbers criticize their lack of interest and motivation to persist in STEM (Fernández et al., 2020). González and Wilson (2020) noted that resilient Latinas have distinct supportive networks including family, community, and institutions. Also important is Latina students' membership in student organizations, which cultivates feelings of belonging and inclusion, increasing their sense of empowerment to access student services and resources (González et al., 2020; Kim et al., 2020). In addition, Venegas and Espinoza-Wade (2020) found that self-determination and self-esteem are important factors in adapting to the STEM college environment. Developing a strong science identity, adopting leadership skills, and participating in mentoring practices are other strategies that strengthen Latina students' resilience (Contreras Aguirre, 2022; Contreras Aguirre & Banda, 2019; Verdin & Godwin, 2018). Other scholars (Kim et al., 2020; Rodríguez et al., 2020; Verdin & Godwin, 2018) have highlighted the importance of understanding the intersection of Latinas' multiple identities that support the development of their social and academic belongingness. Latinas' science identity is developed by achieving a strong connection between their cultural and community wealth and the knowledge acquired from STEM academic programs through collaboration with peers and professors (Contreras Aguirre, 2023; Rodríguez et al., 2020).

Impact of COVID-19 on the Borderland Communities

Borderland communities along the US-Mexico border compose 50% of the Latina/o demographic (The Southern Border Communities Coalition, 2021). In DA County (2017), approximately 90,000 people at the lower end of economic status face a critical lack of access to basic infrastructure, such as paved roadways, clean water, and electricity. Other important needs include the lack of full healthcare coverage and even adequate access to healthcare facilities. According to the United States-Mexico Border Health Commission (2014), people in the border area are more likely to lack private insurance and health coverage, leading to a lack of awareness of chronic diseases such as obesity and diabetes, which are common among the Latino population. Such conditions may increase the incidence of major complications when people get infected with COVID-19. Additionally, individuals' race and ethnicity aggravate "the pre-existing racial and health inequalities already present in U.S. society" associated with the pandemic (Van Dorn et al., 2020, para. 4). The economic stagnation in the border communities exacerbated the challenges of facing a pandemic on top of the existing financial, health, and living conditions. The next issue to be addressed is mental health.

The Pandemic and its Mental Health Effects

The pandemic has brought multiple mental health issues to people's lives. One of these, described by Keyes (2002) as languishing, refers to a loss of interest and motivation to perform daily duties and activities. A dominant emotion during the pandemic was "a sense of stagnation and emptiness. It feels as if you are muddling through your days, looking at your life through a foggy windshield" (Grant, 2021, Para. 3). In addition, the pandemic has dramatically impacted students' levels of academic engagement, with many experiencing a lack of motivation before and after (Albelbisi & Yusop, 2019; Aguilera-Hermida, 2020). Collective grief was another feeling experienced by individuals who perceived "the loss of normalcy, the fear of economic toll, and the loss of connection" (Berinato, 2020, Para. 4) as a result of the pandemic. Anticipatory grief is linked to an uncertain future and thoughts that something bad will happen to us or our loved ones were a collective feeling (Berinato, 2020). Individuals who find meaning in times of grief give sense and light to those negative feelings. During the pandemic, people found meaning and purpose by using technology to connect with others and enjoy outside moments (Berinato, 2020). College students coped with increased feelings of loneliness, isolation, stress, and anxiety leading to higher probabilities of depression and suicidal thoughts (Lawson et al., 2021; Son et al., 2020; Wang et al., 2020). These feelings were a result of switching to

online courses, stay-at-home orders, limited public events, and a lack of social interaction (Lawson et al., 2021). Other effects included variations in sleeping routines, worries about academic achievements, and difficulty with concentration (Son et al., 2020).

Challenges Concerning Online Learning

Aguilera-Hermida (2020) and Hussein et al. (2020) studied different challenges that students faced with online classes. They found that situational and environmental factors, such as studying from home with distractions and noises as well as struggling to balance family duties and school responsibilities, were significant difficulties. Online education-related issues included problems with understanding class content, lack of support services, miscommunication with professors, and unstable internet connectivity. Additionally, emotional elements linked to a lack of motivation due to the quarantines and negative feelings such as stress, anxiety, and concerns caused by COVID-19 were reported.

In addition, the lack of interaction with professors and peers was one of the most salient difficulties students faced, and this was directly related to a lack of motivation (Aguilera-Hermida, 2020). Overall, students considered online learning more difficult, especially during a pandemic when educational institutions used an "emergency online delivery method" (Aguilera-Hermida, 2020, p. 6). Students also reported positive aspects of online learning, such as gains in technological skills and self-efficacy as learners. Self-efficacy improved students' sense of task completion, effort, resilience, and achievement, boosting their academic expectations and performance (Alghamdi et al., 2020; Aguilera-Hermida, 2020). Freedom and convenience are two main characteristics of online learning, allowing students to take classes and complete assignments anytime and anywhere (Hussein et al., 2020). Aguilera-Hermida (2020) noted the importance of faculty and staff in providing the appropriate tools, technology, and training for academic performance, as well as supporting students through a positive and meaningful online learning environment.

CONCEPTUAL FRAMEWORK

The conceptual framework that guided this study was the Latina resilience model (González, 2020). Building upon the community cultural wealth model (Yosso, 2005), which includes an asset-based perspective of minoritized students, this framework focuses on Latinas' cultural values, behaviors, and knowledge (González & Wilson, 2020).

These three elements interact to build resilience, effectively reinforcing Latinas' self-reliance and inner beliefs about their success as STEM students. The Latina resilience model includes a cycle with four

different contexts where Latinas typically navigate and show tenacity: home, school, college, and the workplace (González & Wilson, 2020). The model is not linear but cyclical, with each context affecting the others as Latinas move from home to college and from college to the workplace (González & Wilson, 2020). This model considers Latinas as a group, a new generation, and a broader category with high interaction among their race, gender, and a "borderland" space (González &Wilson, 2020, p. 5). Anzaldua (1987) described "borderlands" as characteristics of individuals, such as distinct languages and knowledge based on previous experiences. This intersectionality makes Latinas unique, bringing diverse experiences to college and challenging contexts as STEM students, professionals, and citizens.

Figure 1
Latina Resilience in Model STEM
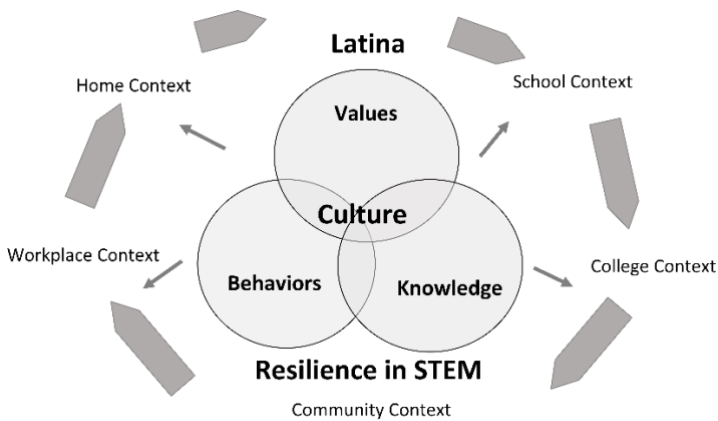
Source: (González & Wilson, 2020)

According to Yosso's (2005) model, students of color use resilience throughout their lives by employing their talents, strengths, and values. Other scholars have found academic resilience among Latina students, with personal drive, a strong internal locus of control, family support, advocacy, and mutual respect contributing significantly to their personal, academic, and professional achievements (Graff et al., 2013; López et al., 2020). Aligned with this research, the Latina resilience model (González, 2020) emphasizes the influence of Latinas' culture in developing certain values, generating knowledge, and adopting responsive behaviors as a form of resistance.

RESEARCH METHODS

Using a qualitative case study approach (Yin, 2014), this study employed semi-structured interviews to identify the new challenges and barriers that Latinas pursuing STEM degrees faced amid the pandemic. The researcher interviewed seven participants at a single institution. The pandemic and the limited number of people allowed on campus made it difficult to reach more students. Participants met the following criteria: (a) identify as Latina, (b) enrolled in STEM, (c) be an undergraduate student, and (d) attend the south-border university. All interviews were conducted via Zoom, a tool extensively used during the pandemic. The study received IRB approval #20574.

Data Collection

Data collection started in the fall of 2020, with the support of the Chicano Program, Ethnic Studies, and selected student organizations in distributing an invitation email. Potential participants reached out to the researcher by email to set individual meetings for the interviews based on their availability. The seven participants were in the 20-26 age range, mostly junior and senior students, and represented Engineering and Biology. Before the interview, participants read and signed a consent form and completed a demographic survey, which included information such as their hometowns, unemployment status, and on-campus involvement. The researcher conducted the interviews using a semi-structured interview protocol to guide the conversation via Zoom with each interview lasting about 35-50 minutes. Questions focused on participants' interest and motivation to pursue a STEM discipline, the impact of COVID-19 on their personal, academic, and professional lives, and the types of support for their academic success. Observations during the interviews and a reflexive journal were also employed to triangulate the data (Lincoln & Guba, 1985) and better capture participants' impressions, reactions, and feelings. Participants selected pseudonyms to protect their identities, which were used in the Findings section.

ANALYSIS

The interview audios were transcribed using Rev, a transcriptionist professional company, and the transcripts were then uploaded to Dedoose, an online website for data analysis. The researcher used inductive analysis, reading the transcripts several times until patterns emerged, which later became themes and categories (Lincoln & Guba, 1985). The researcher then began unitizing the data, identifying pieces of information that have meaning regardless of their length. Each piece of information was assigned to a named category, and groups of categories were organized under themes. The analysis

included several readjustments to ensure that the researcher addressed the purpose of the study and the research questions (Glesne, 2016). The researcher also utilized documentation from the observations and journal entries to complement the information provided by participants.

Study's Trustworthiness

The following techniques were used to ensure the study's trustworthiness: 1) Credibility: The researcher employed observations during the Zoom interviews and triangulated the data by collecting information from different sources, such as interviews, journal entries, and observations. And 2) Transferability: The researcher developed and requested participants to fill out a demographic survey to collect additional information. Furthermore, a purposeful sample allowed the identification of a homogenous group of participants according to the selection criteria (Lincoln & Guba, 1985).

Researcher Positionality

As a first-generation Latina scholar, I am passionate about the education and progress of Hispanic college students pursuing STEM degrees. In my various positions at HSIs, I have served as an instructor, mentor, tutor, and advisor to minority undergraduate and graduate students, mostly Hispanics. As a researcher, I have conducted several studies addressing the experiences of minority and underserved students in college, covering topics such as advising, mentoring, tutoring, learning, and socializing.

FINDINGS

The following is a summary of findings that emerged from the data analysis.

Academic and Personal Adjustments

Participants revealed that they had to quickly adapt to the new academic environment while also dealing with the effects of the pandemic on their personal lives. Fast academic adjustments and the presence of sick people around them increased their stress levels and made them feel physically and mentally vulnerable. One significant concern was the possibility of contracting the virus. On this subject, Maria commented, "The most stressful thing was…the fact that it's a respiratory disease and that there's not really anything that could just like keep you out of the loop of getting COVID." Family concerns about students' safety were also significant. As Reyna stated, "My mom just worrying about me, not only about my school and about my grades but also about my physical health." Following the Centers for Disease Control and Prevention (CDC) measures, government guidelines, and institutional recommendations, participants adopted prevention strategies. For example, Isabel kept a small bubble of close friends

and mentioned, "My closest friends, we still hang out in person, because I only have two or three close friends…we're just going to stay safe and always hang out together." Alex emphasized the importance of keeping a safe distance, repeatedly saying, "We have to be six feet apart." These actions were taken to prevent contracting and spreading of the virus, especially among immunocompromised people.

Difficulties staying focused and being accountable as college students became a struggle with family and pets nearby. Maria said, "Because I'm at home. I'm just lying around. And I tell myself, you got to do your work. Come on, go back to studying, and it's hard because I'm just at home." Similarly, Isabel added, "It was very stressful at first because we weren't used to having the whole family in the house all the time." In turn, Reyna shared, " I feel like I'm just in my room. I'm in the same area constantly and time just blurs together with different things. And it's pretty crazy." Despite these challenges in staying motivated and interested in their academic performance, Reyna made some small but important changes in her routine. She stated, "I've had to learn how to change my study habits to the point of taking smaller breaks. The ones I didn't know that I would take or consciously take…having to maximize my productivity." Another participant, Maria, stayed on campus as a strategy to stay connected with her peers and focus on her studies. Preferring to study with her friends from college rather than alone, Maria decided to stay close to campus.

Another area of concern was the unpredictability of the future and how we could return to our pre-pandemic lives. Alex mentioned, "I want it to be normal, but it's kind of like walking on eggshells. I don't know how normal we can be." Reyna added:

> I think one of the most stressful aspects is the uncertainty of what's going to happen next, not necessarily with the pandemic itself, but in the opening and closing of buildings, the new regulations in place of the constant change, and not having a specific pattern or consistency, I think has been really, really stressful.

Academically, Reyna pointed out the importance of staff, faculty, and administrators "in being more flexible and understandable" with students as they transition back to in-person activities on campus, especially with freshmen who may lack information about on-campus services and programs.

Another challenge was the stress caused by the absence of in-person interaction with family members. Luna noted, "So, it makes it harder to go see my family like we used to." Isabel declared, "I have only seen my grandma twice since the pandemic when I used to see her almost every weekend. So, that definitely... miss seeing my grandma." Alex mentioned," I

wanted to see my family, but I didn't want to subject my mom to anything because of my roommates, so I didn't really get to see my family as much as I wanted." AB expressed, "You take for granted how many times I was able to see my family because that's very important to me to see my family."

In the absence of close human interaction, Reyna opted for "making time to see people, as simple as going to get some ice cream." She added, "Just having basic human interaction really boosted my mental health." Using the phone or through Zoom and FaceTime, participants kept interacting with family members and friends.

Increased Technological Use and Skills

Participants agreed that the Spring 2020 semester, when all courses and activities switched online, was the most stressful for both professors and students. The sudden change to online learning brought distinct challenges but also new opportunities to acquire other skills. Alex recalled, "It didn't really transition. It just kind of all at once, everything kind of happened. I work on campus too, so the first thing was, I couldn't go in to work anymore." Maria added, "I used to go and like study in the library with a bunch of my friends and now that's not really possible since you can't have big groups together."

Organizing study groups for the hardest classes was one strategy AJ, Maria, and Luna used to perform better academically. Luna mentioned, "I review the lectures, but what helps me the most is when you connect with people and make a study group." Similarly, Isabel added:

Now, we study together on Zoom or just make Zoom meetings and say, "Hey, do you want to study for this exam tomorrow   on Zoom?" And it's still weird to me because I'm not used to   that, but it's a slow adjustment to get used to that.

For Luna and Isabel, preparing for exams and working with their peers were connected to their success in college. Reyna used a special application, commonly used by computer science students, to keep connected with her friends. She said, "Discord is probably the biggest one that I used. It's a computer app. It's also a phone app…being able to meet with my friends online and play video games has been very, very big, helpful thing." This quote reflects the importance of staying connected with others using apps.

Other types of adaptation happened in teaching and testing in an online format. Reyna expressed, "The format of online… every professor adapted differently" and "the testing format, I think, was very difficult to get used to as well because every professor that I have is done it differently," causing more stress and adjustment time to the new educational format.

Isabel mentioned, "I think that professors definitely assigned more homework, and they made their exams more difficult" This difficulty was alleviated by having responsive professors. Isabel noted, "Some professors did a really good job at adjusting to online and they would answer their emails really quickly, or they were always there for their office hours." This resulted in students feeling heard and having better attitudes towards their online courses.

However, participants' relationships with faculty also changed. The virtual component fractured interactions with professors, leaving students feeling alienated, isolated, and misunderstood. Reyna said, "We're just overloaded with work, and especially not having a spring break has really, really burnt us out to the point where we even second-guessing continuing either in our major or college in general." This quote highlights a common sentiment among many college students about staying or leaving college.

Similarly, Isabel expressed, "[Professors] wouldn't answer their emails…. they wouldn't be in their office hours for Zoom and that was really frustrating." Some professors lacked skills in teaching online. AB mentioned, "For weeks, I had my professor using his mouse to draw pies and squares and math equations that are hard to understand without having a chalkboard. So, it was difficult to do well on exams having that problem. Isabel added, "A lot of professors did a bad job and their classes became much more difficult…their understanding of technology wasn't really good." Professors' technological skills were at stake and questioned by students.

Throughout the interviews, participants expressed difficulty learning and staying engaged in hands-on lab activities that happened virtually. They also highlighted differences in difficulty levels between technical classes with laboratories and more theory-based courses.

Participants realized that establishing open communication was key to a good relationship with their professors, especially in a virtual academic context. Showing honesty and communicating with professors when unexpected events happened proved effective. Alex stated, "Last semester when my grandma passed, I made sure to tell my professors, "Hey, my grandma's in hospice…. I'm sorry if I'm not active in class…" When she did pass, they were able to understand it wasn't just an excuse." This quote echoes other students' experiences of losing relatives and enduring difficult moments.

Participants experienced new situations where they had to be responsive and take the initiative to pass their courses. There were circumstances and attitudes from others that participants could not control, but they showed determination and willingness to adapt to an even more

challenging academic context. As a result, these Latina participants continue their path to attaining their STEM college degrees.

DISCUSSION AND CONCLUSIONS

In this study, participants shared the ongoing difficulties they coped with during the pandemic, as well as their acts of strength and resilience to overcome academic and personal issues. These challenges were not particular to Latina college students, but given their low representation in most STEM programs, the pandemic added more stress and isolation. The research question framing this section aimed to understand the major acts of resilience that Latina STEM college students engaged in during the COVID-19 pandemic.

The first theme – Academic and Personal Adjustment - addressed how participants balanced their mental health. Multiple aspects caused emotional distress, including: 1) concerns about contracting the virus themselves or family members, especially those who were immunocompromised; 2) difficulties staying focused on classwork and assignments, and a lack of motivation and interest in their duties as college students; 3) worries about the future, including life on and off-campus after the pandemic; and 4) sadness due to the lack of interaction with family members such as grandparents, nieces, and nephews. These factors resulted in high levels of stress, sadness, and hopelessness; feelings associated with grief according to Berinato (2020).

Berinato (2020) identified two types of grief experienced during the pandemic: collective grief, which stems from a perceived lack of normalcy, economic unpredictability, and loss of human interaction; and anticipatory grief, which arises from uncertainty about the future and negative thoughts about what will happen. Despite these feelings, participants demonstrated resilient characteristics, with self-determination and self-esteem (Venegas & Espinoza-Wade, 2020) playing a critical role in their adjustment and mental well-being. Participants provided numerous examples of actions, strategies, and behaviors that helped turn negative feelings into ones with sense and meaning (Berinato, 2020). Likewise, Schulten (2021) found that students redirected negativity into reflection, advocacy, and even creativity.

This study supports the findings of Berinato (2020) and Schulten (2021), as participants found meaning in valuing their interaction with family and friends, being more accountable for their school and free time, and feeling grateful for the technology that kept them connected to those they cared about most. These examples illustrate specific values, behaviors, and knowledge used at home and in college to navigate challenging moments, which

according to González (2020) helped reinforce Latinas' inner beliefs and self-reliance as STEM students.

Adjusting the academic requirements in a virtual environment proved challenging for both students and faculty. The second theme covered the increased use of technology in academic-related aspects. Participants revealed critical stages of adaptation during the first semester when all classes and on-campus activities switched to the online format. Many professors lacked the knowledge and skills to teach online, and participants complained about the limited interaction between students and professors, especially with those who did not answer emails or phone calls. This behavior triggered feelings of isolation, alienation, and frustration. Some professors made little to no effort to learn effective online teaching techniques, using the same methods as if they were teaching in person. These findings aligned with Aguilera-Hermida's (2020) and Hussein et al.'s (2020) studies, which highlighted the difficulties college students faced by switching to online learning amid a pandemic.

To counter these challenges, participants took a resilient approach (González, 2020). As courses became more difficult in terms of workload and testing, some participants formed study groups using Zoom. Additionally, to cope with virtual learning, participants decided to keep open communication with faculty and reach out to professors as needed. Some scholars (Alghamdi et al., 2020; Aguilera-Hermida, 2020) documented positive outcomes of online learning, including gains in technological skills, self-efficacy, task completion, effort, resilience, achievement, freedom, and convenience. Latinas used their talents, strengths, and experiences to advocate for themselves and continue their STEM college pathways even in tough moments (González, 2020; Yosso, 2005).

Vocalizing the experiences of minoritized students struggling because of COVID-19 in fields where they remain highly underrepresented provides insight into Latinas' experiences as STEM college students. This study aimed to contribute to the current literature on Latinas' challenging contexts and their acts of resilience. Latina STEM students not only have to meet high academic program requirements but also support each other in difficult moments. Their cultural values, shared knowledge, and adaptive behaviors in the virtual education environment are important assets. By learning from the experiences of Latina undergraduate students in STEM, institutions of higher education can identify the needed resources and support needed to assist in their persistence and completion.

IMPLICATIONS

This study reported the experiences of Latina STEM college students; however, other students were likely affected by the pandemic as well.

Teaching online requires certain abilities, such as knowledge of the platform used and course structure. Furthermore, the quality of the interaction between the student-professor and the feedback provided is also critical in the virtual environment. It is challenging for faculty to keep students motivated and interested in the course content without interaction. Research conducted by Aguilera-Hermida (2020) found that students reported the lack of interaction with professors and peers as one of the most significant difficulties faced.

Policy and practice implications include: 1) training faculty to promote a positive, meaningful, and interactive online environment to foster academic engagement and learning, 2) reinforcing good online practices and the use of technology through policies should be an institutional priority as online education has grown post-pandemic, and 3) promoting continuous student feedback and improvement in online education may help students feel heard and valued by institutions.

Future Research

Further research may explore the post-pandemic life of college students and the consequences of the pandemic in terms of the wider availability of online education. Other research could focus on the economic, social, and educational pandemic impacts on youth and their interest in going to college.

Study's Limitation

The study targeted a small subset, specifically Latina college students in STEM at a single institution. Additionally, it utilized purposive sampling and did not explicitly include participants from non-STEM programs, other genders, or ethnicities.

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HILDA CECILIA CONTRERAS AGUIRRE, Ed.D. is a STEM education researcher at New Mexico State University. She focuses her research on qualitative/mixed-method studies addressing minority and underrepresented STEM student college performance and persistence and faculty diversity at Hispanic-serving institutions (HSIs). She is the Principal Investigator of the Research-Oriented Learning Experiences in Engineering and the Latinidad STEM Mentoring programs funded by the National Science Foundation.