12-2022

Exploring the Path to Becoming a Female, Hispanic STEM Educator: A Phenomenological Inquiry

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EXPLORING THE PATH TO BECOMING A FEMALE, HISPANIC STEM EDUCATOR: A PHENOMENOLOGICAL INQUIRY

A Dissertation

by

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Submitted in Partial Fulfillment of the

Requirements for the Degree of

DOCTOR OF EDUCATION

Major Subject: Curriculum and Instruction

The University of Texas Rio Grande Valley

December 2022

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ABSTRACT

Saldaña, Cristina, Exploring The Path to Becoming a Female, Hispanic STEM Educator: A Phenomenological Inquiry. Doctor in Education (Ed.D), December, 2022, 111 pp., 2 tables, references, 56 titles.

This qualitative study sought to understand the lived experiences of the participants to identify factors that contributed to their decision of becoming a secondary STEM educator. Participants were identified through criterion sampling, which ensured that the participants were (1) female, (2) Hispanic, and (3) and teach mathematics, science, or engineering (subjects in the STEM field) at the secondary level (e.g. grades 9-12). Through a phenomenological approach, the participants participated in two interviews. The resulting narrative data was then coded and analyzed through an iterative process. The resulting codes were then analyzed to determine any emergent themes. Four themes and five subthemes were identified. Overall, the participants in this study attributed their road to the secondary STEM classroom to the value placed on education by their family, the support they received, and the emphasis their parents placed on the participants ability to be self-sufficient adults. Moreover, exposure and experience, or lack thereof, to career fields contributed to this decision. The decision to remain in the classroom stemmed from being able to give back to students and the collegiality that exists within their current placement.

DEDICATION

This accomplishment would not have been possible without the support of my parents, Maria Saldaña and Marcos Saldaña. Gracias a su sacrificio y apoyo incondicional hemos logrado este título. He aprendido mucho de ustedes y espero enseñarle el valor del trabajo, sacrificio, y de la educación a mis hijos así como usted nos inculcaron estos valores a nosotros. These lessons have encouraged me to work and accomplish the goals I have set for myself. This degree is as much theirs as it is mine. To my siblings and friends, thank you for your unconditional support throughout this journey. You believed in me and cheered me on every step of the way. We did it.

To my husband, Ruben, thank you for your thought provoking questions, love, and dedication to our children throughout this journey. These past three years were definitely an adventure. We started this journey when our sweet Catalina was six months old. Since then, we've added our lovely Aeliana to our growing family. Now, we end this journey awaiting the arrival of our baby boy. Your help and support throughout this time have ensured that I have maximized the time and adventures I have with our girls. Additionally, your dedication to your own learning has been inspiring. I look forward to learning and growing with you as you embark on your own graduate journey.

ACKNOWLEDGMENTS

I have an overwhelming amount of gratitude to Dr. Karin Lewis. From the beginning, you made sure that this first generation doctoral student was never lost and never felt alone. You provided guidance, awareness of the process, and established a culture of collaboration among those of us who have been working through our dissertation under your guidance. It has been a spectacular journey and I am very fortunate to have learned from you during this journey.

I also want to thank Dr. Angela Chapman and Dr. Jaír Aguilar for their guidance and support throughout this journey. As their student, I witnessed their enthusiasm and passion for the work that they do with our students and future educators and I knew that they would provide valuable guidance in this journey. Thank you for being part of my committee and providing invaluable feedback that has allowed me to think about my position as a researcher and prepare for what lies ahead.

Last, I want to thank classmates and accountability partners. You all provided lively discussions during class, engaged in a manner that went beyond what was required from us, and allowed me to guide and be guided. I am excited to see where your work leads you and to work with you all in the near future.

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

CHAPTER I

INTRODUCTION

National data captures a disproportionate representation of underrepresented groups in the current workforce. Statistics from the Census Bureau (2021) and the National Science Foundation (2021) show discrepancies between the population of Hispanic females in the United States and the proportion of Hispanic females currently employed in STEM fields. While approximately 9% of the United States population consists of Hispanic females (Census Bureau, 2021), Martinez and Gayfield (2019) found that approximately 1.7% of the STEM workforce is composed of Hispanic females. The disparities that exist in the STEM workforce are no secret. The literature identifies various factors, such as traditional gender roles, gender bias, and imposter syndrome (Collins et al., 2020; Degol et al., 2019; Tomasetto et al., 2011). These factors, among others, have been shown to influence STEM achievement and propagate the continuity of gender differences in STEM fields (Phipps, 2007; Tomasetto et al., 2011). Data illustrates the major disparity that exists within STEM fields of study as well as STEM careers (National Science Foundation, 2019).

At the early secondary level, these disparities are subtle. Students are typically required to take three math courses in the State of Texas to satisfy graduation requirements. Hence, those who teach Algebra 1, Algebra 2, and Geometry typically see an even mix of both males and females in their classrooms. From the time they take these courses to the time they reach

advanced mathematics courses available to them at the junior and senior level, such as calculus, statistics, and computer science, there is a shift. Those of us who teach these courses notice that there is an imbalance between the number of males and females taking the advanced courses required for pursuing STEM fields. Additionally, we notice different levels of confidence and future career goals between these two groups. In my Advanced Placement (AP) Calculus AB course, it is not surprising to hear engineering as a response from my male students, but a rare occurrence to hear it from my female students. There are currently sixteen students taking this course. Eleven students are female, five are male and all of them are Hispanic. Of the eleven females enrolled in the course, two of them are currently interested in pursuing STEM fields and all five of the males enrolled in the course are interested in pursuing engineering in college.

High school students are a very impressionable group (Leaper et al., 2012). Their lived experiences have contributed to their notions of and interest in the STEM fields. As such, the literature points towards representation in and out of the classroom, as well as role models as significant factors that play a role in the decision to dive into STEM fields (Hutton, 2019; Martin & Fisher-Ari, 2021; Rincon, 2020; Sahin et al., 2017; Sahin & Waxman, 2021; Stevenson et al., 2019). If we wish to promote diversity and the inclusion of Hispanic females in STEM, we must provide a constant visual for these young women, especially at the high school level, where there is a drop in interest in STEM for the girls in our region (Chapman et al., 2020).

In secondary education, however, we continue to see a disproportionate representation of female educators in secondary STEM classrooms. The Texas Education Agency (2021) reports that 70.8% of the teachers in the region are female and 91.1% are Hispanic. While these percentages may signal representation in the classroom, they are not entirely reflective of the demographics of secondary STEM educators. Hence, even in a region where the secondary

student population is predominately Hispanic and educators are also predominantly Hispanic, there is still a gender disparity in who is teaching STEM courses. At one campus of interest, for example, the mathematics department consists of eighteen educators. Of these, four are women and fourteen are men. The Advanced Placement and Dual Enrollment courses are taught by a female and a male educator. The science department at this same campus also consists of eighteen educators, ten of which are female and eight male. All but one of the Advanced Placement science courses are taught by the male teachers. Hence, even in a region where the secondary student and teacher populations are predominately Hispanic, a gender disparity still exists in who teaches the advanced STEM courses in high schools.

Statement of the Problem

To promote representation within the classroom, and in turn provide our female students with experiences that encourage them to follow and persist in STEM-related fields, it is important to identify the pathways that currently exist that motivate Hispanic females into STEM education, as well as the factors that contribute to their decision to continue serving our students in this capacity. Currently, the literature is limited in studying the lived experiences of Hispanic females and their journey into secondary STEM education. Morettini (2017) studied the role that race and lived experiences played in motivating educators to teach STEM-related courses and since none of the participants in the study identified as Hispanic, concluded that "more research should examine the decision to teach for Latinos" (p. 173), citing the growing number of Latino students across the country. Of the students serviced in Region One, which encompasses districts along the southern border from Laredo to Brownsville, 96.6% are Hispanic (Texas Education Agency, 2021).

There is no data available that investigates the chosen post-secondary education career path for students in this region. However, if the proportion of Hispanic females within Region One who aspire to pursue a STEM-related field are similar to the proportions in my own classroom, we know that many capable female students may be overlooking STEM fields for the reasons outlined in the literature. As such, there was a need to ensure that the experiences they gain in the classroom nurture their confidence and ability to pursue STEM fields and persevere in these endeavors (Collins et al., 2020). Knowledge gained from the lived experiences of current Hispanic female secondary STEM educators allowed for a review of both preservice and inservice teacher education that can place capable and nurturing educators that reflect the demographic sorely lacking in STEM related fields and serve as role models and mentors that provide our female students with the necessary support.

Purpose of the Study

The purpose of this study was to investigate the positive experiences that encouraged Hispanic females into the secondary STEM classroom, as well as the experiences and opportunities that have allowed them to remain in the secondary STEM classroom. As such, a phenomenological approach was used to explore these experiences, due to its attention to "describing what all participants have in common as they experience a phenomenon" (Creswell, 2013, p. 76). Doing so allows for the nurturing of these paths throughout preservice and inservice education to ensure that highly qualified, enthusiastic, and supportive Hispanic female educators are in the classroom, where they can encourage Hispanic female students to pursue career paths they may have considered closed to them otherwise, particularly in Region One.

Research Questions

This study sought to identify and explore the positive lived experiences that encouraged Hispanic females to become secondary STEM educators, particularly in the region of interest – the Rio Grande Valley. The research questions that guided this study were the following:

1. What are the positive experiences that encourage Hispanic females to go into STEM education?
2. What learning opportunities and experiences have kept Hispanic females in STEM education?

Both research questions are centered on the educator and are not intended to limit the scope to preservice or inservice educational experiences. Rather, the goal was to identify mentorship opportunities, educational opportunities, pivotal moments in their educational experiences, among others, that promoted this career pathway.

Given that there is plenty of literature regarding the negative experiences that female students both within STEM and STEM education (Collins et al., 2020; Degol et al., 2019; Tomasetto et al., 2011), this study focused on the positive aspects. This allowed for a focus on enhancing what is currently in place, creating a space that encourages this pathway. Aligned to promoting representation and supportive role models in the classroom is the need to ensure that, once in the classroom, educators are receiving the necessary support to encourage them to remain in the classroom or serve in a similar capacity. As such, the second question focused on the opportunities that Hispanic female secondary STEM educators have encountered promote their persistence in secondary STEM education.

Significance

Data from the Census Bureau (2021) and the National Science Foundation (2021) highlight the disparities between the percentage of Hispanic females that the general population is composed of and the percentage of Hispanic females that occupy positions in STEM related fields. This is a disparity that begins to appear long before they are prevalent in the statistics. In upper-level mathematics and science courses, such as the ones I teach, the decrease of female Hispanic students enrolled is alarming, particularly compared to the composition of the lower-level mathematics courses.

While there are many factors that contribute to the lack of representation in upper-level mathematics courses, and in turn STEM-related fields (Collins et al., 2020; Degol et al., 2019; Tomasetto et al., 2011), I focused on a factor that promotes the representation of Hispanic females in STEM fields. Role models and representation have been identified in the literature as a positive factor that may contribute to the reversal of this trend (Hutton, 2019; Martin & Fisher-Ari, 2021; Rincon, 2020; Sahin et al., 2017; Sahin & Waxman, 2021; Stevenson et al., 2019).

The region of interest for this study is composed of primarily Hispanic students (Texas Education Agency, 2021), hence the representation for our female students would be Hispanic female educators. By identifying the positive factors that have led Hispanic females into the STEM classroom, those who develop programs for and teach preservice mathematics educators can enhance current programs to ensure entry to and continuation in the classroom. This literature aided in satisfying the need identified by Morettini (2017), namely the need to identify the factors that lead Latinos into the classroom. Specifically, this research addressed the factors that motivated Hispanic females into the classroom, particularly in the Rio Grande Valley.

Sahin et al. (2017) note that encouragement of STEM educators are significant variables in determining factors that influence STEM career pathways. Collins et al. (2020) were motivated to move into the STEM classroom after experiencing disappointments as practicing professionals in STEM fields and noted the significance of sharing their own experiences and supporting female students' interest in STEM related fields. By acknowledging and understanding the experiences of our Hispanic female educators, teacher preparation courses can learn to incorporate their experiences in preservice education and professional development to ensure they provide our students with the necessary support, particularly those underrepresented in STEM fields.

Positionality

Growing up, education was nonnegotiable. We had to go to school every day, attend every class, and do the best that we could do so that we could be successful. After all, my parents often stressed that they did not make the sacrifices that they did to come to the United States so that we would be without an education. Had they not considered our education as important, they would say, they would have stayed in Mexico and raised us in the *rancho*. My parents had, at most, a sixth-grade education. They worked long hours at warehouses, the *labor*, and factories. They often told us that if they had had the opportunity to attend school growing up, they would have done it to attain better jobs and a more secure future. Using their own experiences as examples, they demanded that we not take the opportunities we were given for granted. There grew the idea that a good education would lead to a good job, one that did not require the manual labor that they endured day in and out so that they could provide the necessities to my siblings and me.

When my parents spoke of the better job that we could attain with our education, they told us we could be doctors, or lawyers or teachers. I think that I was the only one of my siblings that took this to be a literal statement, because these were the only careers paths I focused on. I honestly believed that these were my only options, and no one really challenged this idea. I was naïve about career choices all through high school, and even throughout my first weeks in college. By the time I graduated college, I narrowed down my already narrow list of career choices to education, and I declared myself an education major whose concentration was secondary mathematics education.

Once I began my postsecondary education, I was exposed to the various fields that had been available for me to choose from. I befriended aspiring engineers, chemists, accountants, and computer scientists. All fields that had been, up until that first semester of college, unfamiliar to me. Over the course of my first year, I learned more about what they did and what they wanted to do with their degrees once they graduated and I would often find myself thinking why I did not know these fields existed. Why was I not exposed to or encouraged to pursue these fields by either my parents or teachers? While I remained committed to my chosen career and do not regret the outcome of this choice, I have found myself wondering what I would be doing had I been familiar with these fields throughout my upbringing. Would I still be a teacher, or would I have chosen a different career?

These are the thoughts that define the conversations I have with my students regarding college and career pathways. One group that I focus on are my female students. As a Hispanic female, I understand that we could be raised to believe that there are certain roles we are meant to fulfill. For example, even though my mother taught my sister and I that we should secure a career so that we would never rely on a man in the future, she expected and demonstrated that it

would be our responsibility to take care of the home. These conflicting expectations can interfere with our education and what others believe we are capable of accomplishing.

STEM fields are not free of bias or experiences that make individuals who look like me feel like we do not belong or that we cannot accomplish what we have set out to do. As a graduate student, I encountered professors who would ignore my questions or would score my work lower than those of my male peers, even though the assignment had been collaborative and we had similar work. As a secondary mathematics teacher, I work with a lot of males. When I was pregnant with my first child, I was speaking to one of my male colleagues about my aspirations to begin a doctoral program. Pointing at my very swollen belly, he told me that it did not look like it was something that would happen any time soon.

Experiences shape our perceptions and challenge what we perceive as true. Like my parents, I put my experiences on display so that my students can learn from what I have been through and use it as a steppingstone to where they wish to go. I had a very limited view of my career choices, and as a result I interject as many of these fields into my lessons. By connecting certain aspects of my lesson to the work done by engineers, computer scientists, and chemists, I hope to encourage more of my students to pursue fields in STEM. The conversations I have with my students do not exclude my experiences and how they have shaped my way of thinking. I let them know that I faced particularly challenging moments that they may face as well, particularly my female students. At the end of the day, however, I tell them what my parents would tell me when I doubted myself. *Tu puedes, mija*. *Échale ganas.* Just like my parents always provided their unwavering support and inspired me to be more, I hope to inspire my students to persevere and accomplish what they set out to do. I also aspire to present my students with the role models

that I was never exposed to so that they know becoming an engineer or computer scientist is not impossible.

In regards to my position as a researcher, it is important to clarify why I chose the term Hispanic to identify the participants in my study. As someone from the region of interest, I personally identify as a Hispanic female. At first, Hispanic was just a term that I saw on the check boxes when I would fill out questionnaires or other formal documents that asked about my ethnicity. For the longest time, I thought very little of it and how it represented me. Around me, family, friends, and colleagues used the same language and considered themselves Hispanic. Thus, considering myself a Hispanic individual was something I did not give a second thought to. Over time, however, I have learned that it is not a term that is accepted by all individuals. This realization had me consider what it meant for me to identify as a Hispanic individual. Hispanic is a term that, from my understanding, refers to individuals who come or are descendants of individuals from Spanish speaking countries. As the daughter of two Mexican citizens and being a Spanish speaking women myself, I realized I am comfortable in identifying as Hispanic. While I cannot say with absolute certainty that all of my colleagues consider themselves as Hispanic, I reflected back on conversations had with colleagues and how Hispanic is a term that often came up when we characterized ethnicity. Hence, in consideration of these conversation and my own position on the term, I chose Hispanic over other terms.

Second, STEM is a term that carries different meanings to different individuals. Quite often, STEM refers to just Science, Technology, Engineering, and Mathematics. For me, however, it is more than just a collection of disciplines. It is something that is interdisciplinary and spans beyond the four aforementioned fields. At the moment, STEM disciplines currently encompass those found in the social sciences, such as psychology. This is something that I am

aware of and accept as true. However, for the sake of this study and in consideration for the courses that are taught at the secondary level, S.T.E.M., as defined in the following section, will be considered as a collection of the four disciplines—Science, Technology, Engineering, and Mathematics.

Definitions

The following terms are relevant to the present study.

1. *Role Model* – adults to whom youth look up to and desire to be like (Hurd & Zimmerman, 2014)
2. *Secondary School Level* – some or all grades from Grade 6 though 12 (Texas Administrative Code)
3. *S.T.E.M.* – an acronym typically used to reference a set of educational and occupational fields or domains (Xie et al., 2015, p. 332)
4. *S.T.E.M. Educator* – an individual who teaches a STEM course

CHAPTER II

LITERATURE REVIEW

The statistics regarding females and Hispanics in STEM are startling, even more so when we look at the intersection of these two characteristics in STEM. According to the Census Bureau (2021), STEM fields continue to be dominated men, who comprise 73% of all STEM workers, but only 52% of the working population and 49.2% of the general population. The National Science Foundation (2021) reported that as of 2019, of those employed in STEM fields, only 9% were Hispanic or Latino. Additionally, while approximately 9% of the general population are Hispanic females (National Science Foundation, 2021), only 1.7% of the STEM workforce is comprised of Hispanic females (Martínez & Gayfield, 2019). These statistics point towards a disproportionate underrepresentation of Hispanic females in STEM fields.

A plethora of factors hinder Hispanic females from entering or persisting in STEM fields. These factors are routinely identified and analyzed by the literature (Kao, 2015; Martinez & Guzman, 2013; Mkhize, 2017; Moss-Racusin et al., 2015; Phipps, 2015; Seo et al., 2015), leaving a need to investigate how we can create spaces in education where Hispanic females develop the necessary confidence to enter and thrive in these fields. The literature directs us towards an educational space where role models and representation are present, such that they allow Hispanic females to gain the necessary confidence to pursue careers in STEM, rather than shun the field altogether due to the possible negative experiences (Hutton, 2019; Morel-Baker,

2017). While not all students have parents in STEM-related fields, or exposure to STEM practitioners through other means, they all have educators that they interact with daily who can provide the necessary support, encouragement, and experiences that make a difference in the career trajectory of any student.

Importance of Role Models and Representation in STEM

When it comes to promoting STEM-career interest, the research outlines factors such as STEM-related courses taken and success in such courses, exposure to STEM, parents, and teachers (Martin & Fisher-Ari, 2021; Sahir & Waxman, 2021; Sahir et al., 2017; Tey et al., 2020). Additionally, the literature identifies role models and representation as factors that have an impact on the gender and ethnic differences that are present in STEM education that affect a students' interest in STEM fields (Bench et al., 2015; Chapman et al., 2020; Colman, 2020; Rincon, 2020; Sharkawy, 2015; Van Camp et al., 2019; Yu & McLellan, 2019). While role models can take the form of historical figures that have made meaningful contributions to a field or cause, teachers can also fill these shoes and provide a more impressionable and constant influence, creating a case for studying the positive factors that influence Hispanic females into STEM education.

Whether they are aware of it or not, teachers play a significant role in motivating students to pursue STEM-related careers. Sahir et al., (2017) found that STEM teacher encouragement was a statistically significant factor in predicting interest in STEM-related fields for students at a large, diverse public charter school in Texas. This longitudinal study examined formal and informal STEM-related experiences from 9th to 12th grade (Sahir et al., 2017). In studying the same public charter school in Texas, Sahir and Waxman (2021) later found that aside from parents, teachers were the second most influential factor in STEM career interest. Additionally,

"STEM teachers' expectations statistically significantly predicted students' STEM major interest in college" (p. 50).

When researching Hispanic females, Morel-Baker (2017) found that role models, specifically teachers and parents, were motivating factors for these participants to pursue STEM-related fields. All twenty-four of the participants in this study were Hispanic females majoring in STEM-related fields at a 4-year university. In indicating the role models that influenced them in pursuing STEM fields, all twenty-four participants indicated teachers, particularly secondary-level STEM content teachers, in piquing that interest (Morel-Baker, 2017).

In these studies, the teacher was credited for creating a space of high expectations and a love for the field of study (Martin & Fisher-Ari, 2021; Sahir & Waxman, 2021; Sahir et al., 2017; Tey et al., 2020). Sahir and Waxman (2021), for example, noted that participants characterized these teachers as passionate individuals who brought their subject to life. Moreover, for these reasons, participants claimed that these STEM teachers "affected [their] intentions when it came to STEM fields" (Sahir & Waxman, 2021, p. 51). Morel-Baker (2017) found that for the participants in the study, those who influenced them to pursue STEM-related fields were genuine and authentic and challenged them to push further.

These characteristics juxtapose those of educators who create a hostile environment for Hispanic females in STEM classrooms. Stevenson et al. (2019), for example found that the participants—three Latina high school students in Georgia—experienced discriminatory acts based on "assumptions made on the basis of their appearance, Spanish fluency, and English capacity" (p. 9). These judgements led to acts such as moving students to ESL classrooms and assumptions that the student was not able to comprehend the content (Stevenson et al., 2019). Unfortunately, similar deficit assumptions about Hispanic females are present throughout post-

secondary education and STEM fields (Valenzuela, 2020). Aguirre et al. (2020) studied the STEM experiences of 10 Latina students enrolled at a Hispanic-Serving institution and found that due to the aforementioned assumptions the participants of the study experienced "an ongoing struggle to demonstration [their] intelligence to both male peers and professors" (p. 816).

Teachers as role models can inspire students to pursue STEM fields of study and, ultimately, STEM careers. Van Camp et al. (2019) found that for females in STEM, role model identification was "positively related to STEM identity, STEM belonging, intentions to pursue a STEM career, and… STEM GPA" (p. 665). In promoting the participation of Hispanic females in STEM fields, however, the research also indicates that representation is crucial (Aguirre et al., 2020; Martin & Fisher, 2021; Moakler & Kim, 2014; Monarrez et al., 2021; Rincon & Rodriguez, 2021; Van Camp et al., 2019). Being taught by an individual who looks like them and has experienced some of the hardships that are typical of female Hispanics in STEM allows for a mentorship-type of support that these students may not receive otherwise (Martin & Fisher, 2021). The literature illustrates that along with role models, representation can positively impact Hispanic female students and their STEM career interest development, further highlighting the importance to identify the factors that encourage Hispanic females into STEM education.

For Hispanic females, representation in the classroom is one that can go a long way, and is, in fact, something that is sought. Aguirre et al. (2020), for example, noted that participants in the study gravitated towards individuals who shared similar characteristics in the absence of faculty who reflected their demographics. These participants "considered the absence of Latina professors in their [Science and Engineering] programs problematic and verbalized their interest in having someone who looks like them in the learning space" (p. 818). Rincón and Rodriguez

(2021) echoed these results. In the absence of representation amongst faculty, seeing individuals who reflected their demographics assisted female, underrepresented students to move past existing barriers faced by "women, minority, and first-generation college students in STEM in order to recognize themselves as successful STEM college students" (Rincon & Rodriguez, 2021, p. 155). In a quantitative analysis, Rincón (2020) found that "Cohort-level Latinx student representation was a significant predictor of retention [in STEM]" and that a "1% increase in cohort-level Latinx student representation in a STEM subfield was associated with a 16% drop in departure from the university" (p. 445).

To promote STEM fields, students must have access and exposure to the STEM careers that are available, as well as the necessary academic support to ensure their persistence in the field (Coleman, 2020). Actions, such as formal and informal STEM opportunities can mitigate the "change in the characteristics, attitudes, and academic achievement of Hispanic females from elementary to high school" (Chapman et al., 2020, p. 723). Regarding a child's K-12 education, Hutton (2019) noted that "encouragement and access to information early and often… from STEM professionals who look like them or come from similar backgrounds" (p. 18), indicating that representation at the primary and secondary level can be an opportunity for the promotion of STEM fields at these levels. Given the evidence supporting the need for Hispanic female representation, Martin and Fisher-Ari (2021) indicate that this "is a source of strength that should be fostered within education offerings" (p. 1085). As such, we must look towards Hispanic female educators and their road towards STEM education so we can foster the same path for those who share the desire to educate future generations.

Hispanic Female STEM Educators

To look at the ways we can encourage and support Hispanic female educators to enter and thrive in STEM education, we look toward the literature to determine what has been studied so far and how we can supplement the current conversation on the topic. While the literature is limited, insight gain is not taken for granted. Cultural capital (Monarrez et al., 2021) is cited as motivation to enter STEM education for Hispanic educators. Additionally, race (Morettini, 2017) and disillusionment with STEM professions due to the deficit mentality of others (Collins et al., 2020) have been cited as a motivating factor for underrepresented STEM educators (Morettini, 2017).

In reflecting on the experiences that led them to become STEM educators, Collins et al. (2020) make connections to the importance of their current position at their respective institutions situated in Texas, Tennessee, and California. As STEM practitioners, Collins et al. (2020) faced stereotype threat, imposter syndrome, and the voices of colleagues that told them they were not made for the STEM field. While these obstacles hindered their advancement in their desired field, it paved the way towards the STEM classroom. One of the authors, for example, found refuge in teaching. During this time, this author notes that recognition of commonalities between the students serviced and their own experiences (Collins et al., 2020). The author notes that this awareness came with the thought that "[she] could make a difference if [she] served as a teacher for at least a few years" (p. 173). As a trained engineer, this author reflected on the hardships faced while practicing and saw that they had the power to "inspire and help students realize their true potential," (p. 174).

The factors faced by the authors are, unfortunately, not unique. Females studying STEM or practicing in STEM fields are faced with these contextual complexities within the STEM

pathway (Gallard-Martínez et al., 2019). For Collins et al. (2020), these contextual complexities became a source of inspiration once they were within the classroom. The struggles endured by the authors helped guide the educational experiences they provided their students. Furthermore, these experiences allowed them to understand and provide their female students with the necessary support to thrive within and beyond their classrooms (Collins et al., 2020). While the literature currently does not corroborate these ideas for Hispanic educators, it does provide us with a possible avenue through which to explore Hispanic female STEM educators' motivation to enter the field.

Morettini (2017) studied the connection between race and the motivation to become STEM educators. Of the thirteen participants in Morettini's (2017) study, six individuals were African or African American, one was Korean, one was Filipina, and the remaining five were white. Morettini (2017) highlights the experiences that these STEM educators shared with the researcher and how it related to race. Of the participants in the study, race was either found to be a motivating factor to pursue education or a played a key role during their first-year teaching experiences (Morettini, 2017). African American participants in the study identified race as a motivating factor due to the negative educational experiences endured (Morettini, 2017). One participant, for example, shared that he felt that "his White teachers did not see his academic potential behind his darker skin" (Morettini, 2017, p. 170). Female participants in the study shared their experience with race and gender and how these experiences motivated them to pursue education. One of the female participants tied these experiences with "her desire to help African American students, females in particular, think about careers in the STEM fields such as the career she previously had in engineering" (Morettini, 2017, p. 170).

Monarrez et al. (2021) connects cultural wealth to Latinx STEM teacher motivation. For this study, 15 participants were identified and selected, all of which were STEM majors and identified as Latinx. The resulting themes were "past experiences with teachers, making a difference as a teacher, focus on content area, and helping the community" (Monarrez et al., 2021, p. 169). Familial, aspirational, navigational, and emergent resistant capital informed the data analysis, leading to the conclusion that through these forms of capital, participants found a "foundation for forming their teaching personas" (Monarrez et al., 2021, p. 175). This persona was tied to the desire to fight for their students, based on their own experiences, so that they can promote a positive path for their students (Monarrez et al., 2021).

Educational and professional experiences influence an individual's decision to become a STEM educator (Collins et al., 2020; Monarrez et al., 2021; Morettini, 2017). While these studies did not specifically highlight the motivation for Hispanic females, they do identify the contextual factors that encourage minorities and females into STEM education. Thus far, the literature highlights some of the negative encounters current educators faced that led to their decisions to become STEM educators, as well as the positive role that familial capital played in said decision. While there is a healthy amount of literature outlining how stereotype threat and gender bias are intertwined in the STEM educational experiences of females and minorities (Bench, et al., 2015; Kao, 2015; Plante et al, 2018; Ross, et al., 2012; Tomasetto et al., 2011), there is a limited amount of research that addresses the connection between the experiences of Hispanic females and their motivation to become STEM educators. Morettini (2017) specifically addresses the need to understand this motivation, citing the increasing population of Latinx students.

Region Demographics

Currently, we see that the demographics of teachers in STEM do not match those of students. A comparison between the demographics of Texas students and Texas STEM educators reveals a discrepancy in representation when it comes to ethnicity and gender. Demographic data released by the Texas Education Agency (2021) notes that as of the 2020-2021 school year, 52% of all students in Texas were Hispanic and 48.9% of all students were female. When it comes to the demographics of educators who received a mathematics teaching certificate as of the 2017-2018 school year, 64.5% were female and 26.4% were Hispanic/Latinx (Ramsay, 2018). Of those with a science teaching certificate, 62.3% were female and 25.6% where Hispanic/Latinx (Ramsay, 2018). While the percentage of White mathematics and science teachers has declined since the 2008-2009 school year, White educators still account for most of the newly certified mathematics and science teachers (Ramsay, 2018). The Texas Education Agency (2021) reports that only 24.44% were Hispanic or Latinx compared to the 52.88% White newly certified mathematics educators during the 2019-2020 school year. In science, those percentages are similar. Of the science educators who entered the profession in the 2019-2020 school year, 24.35% were Hispanic or Latino and 54.77% were White (Texas Education Agency, 2021).

At the local level, these numbers are different. Region One (2021), which encompasses eight counties along the South Texas Border, reports that 96.6% of students serviced in this area are Hispanic, a stark difference from the percentage of Hispanic/Latinx students serviced at the state level. Servicing these students is a teacher workforce that is composed of predominately Hispanic females. Of all teachers in Region One, 70.8% are female and 91.1% are Hispanic (Texas Education Agency, 2021). At a glance, it may appear that within Region One representation is occurring. A closer look at individual campuses, however, paints a different

picture. At a high school situated in Region One, out of the 18 mathematics teachers servicing students, only four are female. At a specialty high school within the same district in Region One, out of the five mathematics teachers, only one of them is female and out of the five science teachers, again, only one is female. While these numbers are not representative of all mathematics and science departments in our regions, it does highlight the fact that in STEM courses, representation is an issue.

Theoretical Framework

To create learning environments that encourage Hispanic female students to aspire to pursue and thrive in STEM fields, this study sought to understand the motivating factors that drive Hispanic females into STEM education through the lens of Gottfredson's (1996) Theory of Circumscription and Compromise. This theory was most appropriate to use in this study based on the literature and my personal motivations that have led me into the field. The literature pointed towards factors such as gender, culture, family, and an individual's surroundings as key in career motivation. Gottfredson's Theory of Circumscription and Compromise frames an individual's career choice through such a lens and discusses how, beginning in early childhood, an individual is already actively making decisions that will lead them to their ultimately chosen vocation.

Gottfredson's (1996) Theory of Circumscription and Compromise outlines the process through which individual's begin to narrow down potential vocational fields and the factors that contribute to one's chosen vocation. The purpose for such a theory was to address the question regarding "the origins of individual and group differences in career development" (Gottfredson, 1996, p. 179). As a child, one casts a very wide, sometimes quite unrealistic, net regarding career

choices. Throughout the process of circumscription, a child begins identifying the career fields which are not acceptable based on a myriad of contextual factors (Gottfredson, 1996).

The first stage of circumscription occurs when a child is between the ages three and five and is focused on a child's orientation to size and power (Gottfredson, 1996). At this age, children begin to recognize adult roles and, interestingly, the "concrete… observable differences in gender… and report same-sex preferences for adult activities including employment" (Gottfredson, 1996, p. 192). The second stage, which occurs when a child is between the ages six to eight, is focused on a child's orientation to sex roles (Gottfredson, 1996). It is at this stage that children begin narrowing what is within the realm of career possibilities due to sextype more than any other factor (Gottfredson, 1996).

During the third stage, which occurs when an individual is between the ages nine to thirteen, the orientation to social valuation becomes more pronounced. At this stage, individuals continue to prune their potential vocational choices based on how an occupation is perceived within their own families and community, as well as the value a potential career can add to their adult life (Gottfredson, 1996). At this stage, factors such as socioeconomic background play a heavy role in allowing an individual to determine the level of so-called prestige that certain careers bring and the classified prestige varies across the socioeconomic background of the individual. What may be considered prestigious in one community may not be considered prestigious in another (Gottfredson, 1996). From the age of fourteen to adulthood, individuals have an orientation to the internal and unique self when it comes to career choices. Here, an individual begins to seek actual career choices within those that they deemed acceptable in earlier stages (Gottfredson, 1996).

The last stage in circumscription gives way to the compromise phase of this theory. Here, an individual begins to consider the accessibility of a career in conjunction with what they have deemed acceptable (Gottfredson, 1996). Gottfredson (1996) states that "parents, friends, teachers, colleagues and others in one's social network play a key role in shaping perceptions of accessibility" (p. 198). Hence, the accessibility of the same occupation may be different across various groups. Information may not be as readily available within certain groups, hence lowering the accessibility of certain career choices.

Gottfredson's (1996) theory specifically investigates how "an individual's group-based identities and circumstances influence where one prefers and then attempts to fit into the social order" (p. 202). Gottfredson (1996) outlines four considerations: public versus personal, reference groups, group differences in career-relevant traits versus developmental process, and cultural change. Through these considerations, Gottfredson (1996) postulates that race and ethnicity are among "the most concrete and visible social attributes" (p. 202) which "have the earliest and deepest importance for individuals" (p. 202). Additionally, career expectations are largely set by the groups to which they have had the most exposure leading to disparities between groups due in part to factors such as differences between gender, social class, race, and ethnicity (Gottfredson, 1996, p. 202).

Coupled with the chosen methodology, Gottfredson's (1996) Theory of Circumscription and Compromise allowed me to outline and analyze particular factors, cultural and otherwise, that have led Hispanic females into STEM education. Additionally, it allowed me to create the questions that guided the interviews. This allowed me to shed light on the particular reasons Hispanic female STEM educators in the Rio Grande Valley have chosen STEM education.

Summary

As Hispanic female students go through their P-12 education, they are exposed to a myriad of factors that influence their decision regarding whether they will ultimately pursue careers in STEM fields. While there are various factors to take into consideration, one that can be addressed within the realm of education is representation. Statistics from the Census Bureau (2021) and the National Science Foundation (2021) corroborate what is cited by studies as an underrepresentation of Hispanic females in STEM (Landivar, 2013; Rincon & Rodriguez, 2021). Moreover, studies have connected this underrepresentation to detrimental effects on this population in STEM courses (Chervan et al., 2011; Rincon, 2020; Stout et al., 2011). Hence, it is important that we direct our efforts in establishing and fostering a learning space that encourages Hispanic female students to enter and thrive in traditionally White, male spaces in STEM. Role models and representation have been identified through the literature as key to encouraging this representation (Martin & Fisher-Ari, 2021; Sahir & Waxman, 2021; Sahir et al., 2017; Tey et al., 2020). From the literature regarding what drives STEM educators, specifically Hispanic females, into STEM education, I draw on the literature to provide an entry point for my study.

The region of interest in my study is predominately Hispanic and the student population reflects the regional population. Role models and representation have been identified as important, positive factors that encourage Hispanic females towards STEM fields, hence I intended to look at the experiences of Hispanic female STEM educators, specifically at the secondary level, and how their experiences played a role in career choice. An understanding of these experiences can assist in the development and improvement of both preservice education and professional development for inservice educators in STEM courses, as well as opportunities afforded to students while still in school. The selected theoretical framework allowed for a lens

through which I analyzed the lived experiences of the participants and investigates the rationale behind their entry in STEM education. In the following chapter, I will discuss the chosen methodology, the selection of the participants, how the data was collected and analyzed, and how trustworthiness was established.

CHAPTER III

METHODOLOGY

Given that the interest of this study rested in understanding and describing the experiences of STEM educators, qualitative methodologies were utilized. Marshall and Rossman (2016) note that qualitative research "draws on multiple methods that respect the humanity of the participants in the study…focuses on context [and] is fundamentally interpretive" (p. 2). Furthermore, qualitative research studies "things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them" (Denzin & Lincoln, 2011, p. 3). With the researcher as the key instrument (Creswell, 2013), qualitative research allowed for rich data collection and exploration that would be limited if a quantitative approach were to be selected. Qualitative research allowed for the exploration and the capturing of the essence (Creswell, 2013) of the experiences that positioned female, Hispanic STEM educators in their current roles and have allowed them to continue growing as STEM educators. The location of this study was relevant to these experiences, given that we are situated in an area where the population has a higher concentration of Hispanic students and teachers compared to the state (Texas Education Agency, 2021).

Due to its focus on "describing what all participants have in common as they experience a phenomenon" (Creswell, 2013, p. 76), a phenomenological approach guided this study. Marshall and Rossman (2016) describe a phenomenological approach as one that "seeks to

explore, describe, and analyze the meaning of individual lived experience" (p. 17). The phenomenon under study here is Hispanic females becoming and remaining STEM educators. The research question led me to review the lived experiences of this group of individuals to describe the positive experiences that have led them and allowed them to remain in their role as STEM educators. Phenomenology allowed me to pose questions that explore the nature of their experiences, as well as their understanding of the experiences as they occurred.

Participants

For this study, it was necessary to select a group of individuals who have experienced the phenomenon in question to "best inform the researcher about the research question" (Creswell, 2013, p. 147). Careful consideration was given to individuals ultimately selected to participate in this study. Thus, criterion sampling was utilized to first identify potential participants from three large school districts in South Texas. Criterion sampling allowed for the purposeful selection of participants that met a predetermined criterion (Mills & Gay, 2019). In this case, the criteria for the initial selection reflected the subpopulation and characteristics that have been identified in the research question. Hence, the criteria that guided the initial selection process was to identify educators who were (1) female, (2) Hispanic, (3) and teach mathematics, science, or engineering (subjects in the STEM field) at the secondary level (e.g., grades 9-12).

While there is no fixed rule regarding the number of participants necessary in qualitative research (Marshall & Rossman, 2016), I wished to ensure that I have an adequate number of participants to best inform the research question. Hence, to determine if the selected sample size satisfied the needs of the study, careful consideration to data saturation was taken (Mills & Gay, 2019). Given the constraints of funding and time, however, an initial invitation to participate, as well as whether they would prefer an in-person or an interview via video conference, was sent

out to ten potential participants via email, of which five responded. An additional ten potential participants were identified and sent an invitation, of which three responded. From the eight individuals who initially agreed to participate in the study, five individuals completed the informed consent form and scheduled the interviews. Data saturation was noticeable by the third interview, however, all five participants were interviewed to provide a more robust data analysis.

To gain access to individuals (Creswell, 2013), the appropriate permissions were obtained from the Institutional Review Board (IRB) at The University of Texas – Rio Grande Valley (UTRGV). Once the appropriate permissions were obtained, access to participants was done through the appropriate communication channels, in this case emails, between me and the identified participants. Consent forms and an invitation to participate were provided to selected participants so that they were aware of the purpose of the study, the methods involved, considerations to confidentiality, risks, and benefits, as well as the understanding that they are free to withdraw from the study at any time (Creswell, 2013).

Data Collection

Creswell (2013) lists four basic types of data collection approaches for qualitative research: observations, documents, interviews, and audiovisual materials. Given the purpose of the study and nature of the research question, it is essential to delve into the experiences of the selected participants, as told by them. Since interviews allowed for the discussion between the researcher and each participant, semi-structured in-depth interviews were the primary mode of data collection. Aside from the conversational nature of interviews, their appeal also rested in the ability to yield clarification, when needed (Marshall & Rossman, 2016).

Of the three forms of interviews—structured, semistructured, and unstructured (Glesne, 2011)—a semi-structured approach was used. Semistructured interviews called for pre-

determined, carefully sequenced questions, but do not limit the scope of the interview to solely those questions (Glesne, 2011). Pre-determined questions allowed the conversation to remain focused on the topic of interest, respecting both the scope of the conversation and the time of the participant and researcher. Additionally, if ideas or topics related to the research question arose because of the conversation, a semi-structured interview allowed for follow-up questions for the sake of elaboration and further exploration.

To provide participants with flexibility and to respect the family time of the participants, two interviews were conducted per participant rather than the three traditionally aligned with phenomenological interviewing (Marshall & Rossman, 2016). The purpose of the first interview was to engage the participant in a discussion about the past and present experiences with the phenomenon of interest, and the second was to combine the past and present to "describe the individual's essential experience with the phenomenon" (Marshall & Rossman, 2016). The focus of the first interview, therefore, was for participants to discuss themselves and their experiences leading up to the decision of becoming a STEM educator and to discuss their experiences in becoming a STEM educator. The second interview allowed participants to reflect on these experiences to determine how they could have guided them to their current position as a STEM educator. Prior to these interviews, however, I engaged in the inquiry phase known as epoché, which required me to document my own experiences to bracket off my experiences from the interview process and "gain clarity from [my] own preconceptions" (Marshall & Rossman, 2016, p. 153).

Face-to-face interviews would have been ideal, but due to the ongoing COVID-19 pandemic, the participants were given the opportunity to request a video conference. Of the five participants who agreed to be in the study and completed the required consent forms, four

requested a video conference and one requested an in-person interview. At the beginning of each interview, an introductory conversation was held for the purpose of reviewing and discussing the informed consent information, the purpose of the study and the nature of the interviews and talk about the procedures for recording the interviews. The participants had the opportunity to seek clarification regarding the study and were notified that they are free to decline to participate in the study at any time, if they so choose, without any penalty.

All the interviews were recorded using Zoom and transcribed. The data collected via the interviews—audiovisual recording and notes—transcriptions, and other materials were stored electronically on an encrypted, secure UTRGV server, by participant and date. To protect the identity of the participants, a pseudonym was assigned to each participant. The use of pseudonyms allows the participants' experiences to be more real and relatable. The pseudonym was integrated into the data labeled in the electronic storage. A master list of the data collected was also generated to facilitate the identification of data collected from each participant, allowing for the revisiting of data and scheduling subsequent interviews in an efficient manner. This master list contained identifying information, connecting each participant to the assigned pseudonym was stored securely and separately from the data.

Data Analysis

Creswell (2013) outlines a six-step approach to phenomenological analysis and representation to analyze significant statements that helped me understand the phenomenon under study. The first of these steps was to "describe personal experiences with the phenomenon under study" (Creswell, 2013, p. 193). Hence, it was important to bracket my experiences so that the focus was solely on the experiences of the participants and the interpretation is done with fidelity. It is important to note that I am a female, Hispanic STEM secondary teacher in the Rio

Grande Valley, and the question of interest was generated from my personal experiences that have led me to where I am today. Therefore, these experiences were carefully outlined to minimize interference in the data analysis process.

Prior to completing the second step in phenomenological data analysis, which consists of the coding process, it was important to review the transcripts thoroughly to ensure that they were accurate, as well as to gain familiarity with the experiences of the participants and gain a better understanding of their overall messages. As such, each transcript was reviewed and read through three times. Each of these times, the video recording of the interview was played simultaneously to ensure that accuracy of the transcript generated by Zoom. During this review process, there was no coding of the data. This process was followed for both the first and second waves of interviews conducted.

After the review of the transcripts, the second step was to "develop a list of significant statements…about how the individuals are experiencing the topic" (p. 193). To carry out this step, each interview transcript was reviewed line by line and coded. The purpose of these codes was to categorize the data into similar units (Miles et al., 2020). Since there were two interviews conducted per participant, transcripts and other materials was coded in waves. The first wave followed the first round of interviews with all participants. Since the first interview focused on the participant and their experiences leading up to the decision of becoming an educator in a STEM field, coding the transcripts involved primarily In Vivo Coding—"using words of short phrases from the participant's own language" (Miles et al., 2020, p. 65)—Emotion Coding, since it provided "insight into the participants' perspectives, worldviews, and life conditions" (Miles et al., 2020, p. 67), and Values Coding, which "reflect a participant's values, attitudes, and beliefs,

representing his or her perspectives or worldview" (Miles et al., 2020, p. 67). Resulting codes were used to inform questions for subsequent interviews.

The second wave of codes came from the second interview. Since the second interview involved the participant reflecting on their experiences and discussing how their experiences guided them to their current position, Causation Coding, which "extracts attributions or causal beliefs from participant data about not just how but why particular outcomes came about" (Miles et al., 2020, p. 70). Lastly, I engaged in Attribute Coding, which provides "essential participant information for future management, reference, and context for analysis and interpretation" (Miles et al., 2020, p. 71). For both waves of coding, coding happened within interviews and between interviews. Hence, first, codes were generated based on the data within each interview. Once each interview was individually coded, similarities between interviews were noted, which guided the codes that were ultimately used to generate the main themes.

Since there only five participants in the study, I opted out of using software to assist in the coding process. Instead, all codes were organized using Excel. This allowed me to gain a deeper sense of understanding when it came to the data that I was analyzing, as well as familiarity with what data analysis entails. While this made the data analysis process a tedious one, it did allow me to carefully consider which codes were to be grouped together and generate the overall themes.

Data was then reviewed holistically, based on coding that had occurred to determine any themes. This is aligned to the third step, which was to "take the significant statements and…group them into larger units of information… or themes" (Creswell, 2013, p. 193). Miles et al. (2020) describes themes as "an *extended phrase* or *sentence* that identifies what a unit of data is *about* and/or what it *means*" (p. 73, italics in original). Additionally, Creswell (2013) notes

that these themes should express "a simplification of ideas, and a description of the structure of the lived experience" (p. 195). Analytic memos were written to document my logic in the grouping of particular codes to create the overarching themes. While analytic memos can serve many purposes, for this study, the main role of my analytic memos were for documenting participants' actions, reactions, and interaction, outline what was interesting or surprising in responses, and outline emergent patterns, categories, themes, concepts, and assertions (Miles et al., 2020). Additionally, clustering was used to organize the resulting themes.

The fourth and the fifth steps were to write descriptions of " 'what' the participants in the study experiences with the phenomenon" (Creswell, 2013, p. 193), namely a textual description, and to write descriptions of " 'how' the experience happened" (Creswell, 2013, p. 194), namely a structural description. The significant themes identified in the third step guided the writing of a composite description of *what* and *how* of the phenomenon of becoming a STEM educator. The focus of this written analysis was the positive experiences that drove the decision both during the up bringing of the participants and during the preparation path they chose to follow, whether traditional or alternative. The analytic memos, as well as the result of the clustering process guided the writing of these descriptions. These written descriptions of the *what* and the *how* then guided the writing a composite description of the phenomenon (Creswell, 2013). This step intended to capture the "'essence' of the experience and represents the culminating aspect of the phenomenological study" (Creswell, 2013, p. 194).

Trustworthiness

As the researcher conducting a qualitative study, I was the instrument for data collection and data analysis. Thus, it is essential that I outlined "the traits that make [me] personally 'credible' and ensure that [the] interpretations of the data are 'trustworthy'" (Marshall &

Rossman, 2016, p. 44). To address my credibility, I begin by clarifying any research bias. It is important to note that I am a STEM educator at a local high school. My goal was not to confirm my own experiences, but to explore those of others who have ended up in similar positions to describe the phenomenon that is becoming a STEM educator. Hence, to "reflect on my own subjectivity" (Glesne, 2011, p. 49) and bring self-awareness to subjectivity, I journaled my own experiences prior to and following each round of interviews to bracket these experiences from the analysis of the data. Additionally, these reflections allowed me to consider the different experiences and not exclude those which do not line up with my own.

Crystallization, which utilizes multiple sources (Glesne, 2011) and "demands self-critique or self-reflexivity" (Marshall & Rossman, 2016) also aided in the trustworthiness of the analysis. Data was collected from more than one participant, which indicated that the resulting analysis would shed light on experiences that occurred for majority, if not all, of the participants in this study. Analytic memos reflecting the emerging codes and themes were utilized as a reference when constructing the final analysis.

Moreover, the analysis did not depend solely on my interpretation of the data. To ensure that the analysis speaks to the experiences of the participants of this study, member checking (Creswell, 2013; Glesne, 2011) was crucial. Member checking allowed me to "make sure [I am] representing [the participants] and their ideas accurately" (Glense, 2011, p. 49). Each participant was provided with statements that resulted from analyzing the first round of interviews. The purpose for this was so that participants reviewed the preliminary analysis to ensure that their intended meaning was conveyed appropriately and not being misconstrued.

Lastly, to take the reader through the experiences that led the participants to their current positions and help them determine whether these experiences may be transferrable to other

settings, thick description was used (Creswell, 2013; Glesne, 2011). Thick description "allows the reader to enter the research context" (Glesne, 2011, p. 49), enabling the reader to explore the collective experiences, as told by participants to determine both the trustworthiness of the data and the analysis. Hence, the results that follow include quotes from the participants that allow the reader to scrutinize the analysis and ensure that the final description of the analysis was based primarily on the experiences of the participants and not my personal experiences. Being transparent in the process of data collection and analysis with myself, the participants, and the reader will heighten the credibility I aim to achieve.

Summary

Given that this study was interested in the lived experiences of the female Hispanic STEM educators and their journey into STEM education, a qualitative methodology was appropriate for such study. Hence, a phenomenological inquiry was conducted where the phenomenon of study is becoming a STEM educator. Through a two-interview process, I was able to inquire about the experiences of STEM educators, both past and present, as well as their current view of their journey in being a female Hispanic individual in STEM education.

Potential participants were identified from three large school districts in the Rio Grande Valley. These participants were identified through criterion sampling, where the criteria were being female, Hispanic, and currently teaching a STEM course at the secondary level. A total of twenty invitations were sent out. Eight individuals initially agreed to participate, but only five individuals followed through with completing the informed consent form and scheduling the interviews. This chapter outlined the data collection process through interviews, how data was stored to ensure participant confidentiality, and how the data was analyzed. Trustworthiness of the resulting analysis was also addressed in this chapter. In the following chapter, I describe the

participants of the study, as well as outlined the resulting codes and themes that emerged from the data analysis.

CHAPTER IV

FINDINGS

This phenomenological inquiry aimed at exploring the lived experiences of Hispanic females that steered them towards becoming an educator in a secondary STEM field. This chapter will consist of participant profiles, along with the themes and subthemes developed from the participant interviews. Additionally, the resulting themes will be connected to the research question they provided a response to.

Participants

There were a total of 20 invitations to participants sent out to individuals who met the sampling criteria. Of those twenty, eight potential participants responded with a tentative yes, but only five participants scheduled and followed through with proposed interview. These five participants were all Hispanic females who taught a science, technology, engineering, or mathematics course at the secondary level during the 2021-2022 school year. Pseudonyms were used for each participant. All participants currently teach at a secondary school in the Rio Grande Valley and are planning on returning to teach a STEM course during the 2022-2023 school year. The ages of the participants ranged from late twenties to early forties and their teaching experiences ranged from 6 years to 14 years. Table 1 shows participant demographic information.

All five of the participants participated in two interviews, each. The first interview focused on the past and present experiences regarding the phenomenon of interest, and the third

both served as a conversation in which we discussed how all these experiences came down to becoming a STEM educator, as well a member checking opportunity to discuss common themes that arose during the first two interviews. Each of the generated themes includes evidence from each participant, ensuring that there was thematic saturation from the five participants in the study.

Table 1

Participant Demographics

Name	Major	Minor	Years Teaching	STEM Area Taught	Type of Program
Erica	Applied Math	Physics	8	Mathematics	Alt. Certification Program
Ana	Biology	Spanish	8	Science	Traditional
Nancy	Psychology	N/A	10	Mathematics	Alt. Certification Program
Marina	C&I – Math Education	N/A	14	Mathematics	Traditional
Dalila	Biology	Chemistry	6	Science	Alt. Certification Program

Note. All names are pseudonyms.

Dalila

Dalila is a science teacher who completed her sixth-year teaching during the 2021-2022 school year. She majored in Biology and minored in Chemistry at a local university. Her interest in science came from experiences within her family. She stated:

> Ever since I was young, I was considered very mature for my age, because I didn't play around with my age neighbors, same age neighbors. I'd be inside watching NASA with

my uncle, I'd be watching discovery channel with my uncle, and so I would be learning about planets and math and stuff like that.

Education was not Dalila's first choice. She originally entered her undergraduate program with the intention of becoming a doctor upon graduation. Due to unforeseen circumstances and a sense of personal responsibility, Dalila changed her career choice during her final year of her undergraduate studies. She went through an alternative certification program to acquire her teaching certification. While her career choice was not her first choice, when asked if she would choose this career again, she replied:

Yes, in a heartbeat… I love, I really do love teaching.

Dalila noted throughout her interview that her role as a supporting figure to her students is an important factor currently keeping her in the classroom. When reflecting on why she is in the classroom and the significance of her position as a science educator, Dalila states the following:

I want them to be good humans. I want them to be productive members of society, and if I want them to be productive members of society, I want to have an impact on that. I keep doing the parts I don't like because I want these kids to be better… and it becomes this thing that you just, kind of like, these are, these are my medals of honor. This is a badge I wear with pride… yeah.. that's why I did this.

Erica

Erica is a mathematics teacher who completed her eighth-year teaching during the 2021-2022 school year. She majored in Applied Mathematics and minored in Physics at a local university. Erica states that her academic strength was in mathematics, which she tied to her education in Mexico:

> I know that I was taking algebra 1, like, in seventh grade.. or sixth grade! Because fifth grade is geometry. They start with geometry and then you move on to algebra. And I was like, how come they're barely taking this classes here.. and *pos* then I was in calculus my senior year, and in Mexico, in calculus, I would be in my tenth grade, *mas o menos*. So I know some kids do that, but it's not common. And over there, it's the other way around. It's really common over there to be advanced in math.

Like Dalila, education was not her first choice. Erica wanted to be an engineer, but her parents were pushing her towards studying law. In the end, the careers that were envisioned by Erica and her family did not come to fruition. After completing her degree in Applied Mathematics, Erica went through an ACP program, but did not feel like she was prepared to go into the classroom:

> No, it was horrible. My first year was horrible.. I didn't even know what I was doing, but then you learn right as you go.

While she did experience hardships that first year, Erica partially attributed her survival that first year to her colleagues and the fact that she felt she could learn from them and grow as an educator:

> I remember being here my first year, and there's no competition… I'm learning from her. It's just teamwork, not competition. They will help you out with whatever.

Marina

Marina is a mathematics teacher who completed her fourteenth-year teaching during the 2021-2022 school year. She majored in Curriculum and Instruction with an emphasis in Mathematics Education at a university outside of this region. Marina noted that her academic strengths have always been in mathematics, and even though she had an experience that could

have let her astray, she advocated for herself and continued an advanced academic path in mathematics:

> Instead of taking the regular seventh grade, eighth grade math, we had algebra part A, and then prealgebra part B, or something like that… I remember I went into it as a seventh grader into part A, and the teacher, for some reason, kicked me out, and then I ended up going to the regular class… I'm, like, what am I doing in this class? I didn't like the environment… So I ended up going to the counselor and, and I didn't even tell my parents nothing. It was just me doing the work with the counselor.. I ended up going back.

Marina is another participant who did not initially consider teaching as a career. Instead, she began as a business administration major, switched to nursing, and, in the end, pursued her degree in Curriculum and Instruction with a specialization in Mathematics. She went through the traditional certification route and fondly remembers how much they taught her:

> They were challenging, but they were also, like, interesting, because I remember, like one of them, we had to go visit museums, like, what was out there in the community that you could use and bring back as a resource to your class.

However, she did notice that when she began the student teaching of her program, there appeared to be a disconnect between what was covered in the program and what she saw and experienced in the classroom:

> Come students, student teaching, and I did not see that in the classroom. I did not see that, not even from my, from the other teachers. So, what is right? What's real? How did we decide what was real? Was it what you learned at, in school, in your program? Or was it what you saw in the classroom?

Nancy

Nancy is a mathematics resource teacher who just completed her tenth year as an educator during the 2021-2022 school year. She attained her degree in Psychology and a minor in Interdisciplinary Studies from an out of state university. Nancy originally wanted to go into pediatrics or pharmacy, but felt her options were limited at the university, leading her to ultimately opt of an alternative career path:

> I think it would have, for me, it would have been having more support in the university. Having, maybe, like, more, I guess more options available to me during that time. It was, like, okay, this teacher teaches that course, and that's it. But students, sometimes, I mean they work differently with different instructors or different teachers, and not necessarily, oh it's easier. No, but their strategies.

While Nancy's original career path led her to take a lot of science courses, she ultimately opted to teach mathematics at the secondary level. Nancy attained her certification through an alternative certification program, which she felt did not prepare her to enter the classroom due to the lack of formal experience in the classroom prior to her first teaching job:

> It was one of those alternative teacher certification programs, which was really good, but we, you don't know until you get in there. I, I did not know what to expect. Yes, they paint this, you know, this is what a teacher does, but in reality, once you're in there, it's very different and that, that experience, I mean is, is, or, yeah, it's just gained through experience.

Ana

Ana is a science teacher who completed her eighth year as an educator during the 2021-2022 school year. She majored in Biology with a minor in Spanish at a local university. Ana

stated that throughout school, she enjoyed both mathematics and science, but perceived science as a livelier subject. Additionally, unlike the previous four participants, Ana did know that she was going into education from the start:

> Since I knew I was going into education always.. I, I always thought that if I was going to teach something, it have to either be math, or it had to be science, and in my case, I always thought of science as a more lively math. I like math, and I consider myself being good at math, but the context was to abstract for me and I thought of science being more fun, more visual, more hands on… I don't.. I don't know how to explain it. It was more, more lively to me.

This led her to take the traditional certification route at her university. Holistically, she found the traditional certification route to be beneficial and helping her prepare for the classroom, specifically the student teaching experience:

> I think that, that part of the education program is the very best part, because we were, we actually get.. we get into that water. You can say that right? We're getting to the water, and actually feel what it's the teacher life, right? And, and that actually helps out, because when, whenever you become a teacher for a first time, it's not like you're just, they're new to everything, but you already have an idea of what you do.

However, she did note that she would have liked to see more than one teacher in the process:

> Maybe one thing that I would suggest that they do is for teachers to have probably more than one.. being able to, or, or, have a opportunity to have more than one teacher, instead of being with one teacher the whole day, maybe being able to with other teachers as well… So that way, you know, you can, you can see how they model the lesson, but I think it will be nice to also see other teachers who are troubled, you know, and see how

they handled the situation, how they, how they are able to overcome challenges in, in those other classes that, that you don't get to see in, in, these other classrooms.

Apart from Erica, all of the participants stated that they would choose this career again. There were commonalities in the upbringing and experiences of the five participants that led them towards a path of education. Additionally, common themes that arose in discussing what will allow them to continue in the classroom will also be identified. Below, I state and provide evidence for each of the themes that were generated as a result of the data analysis process.

Results

Thematic Development

Each of the participants participated in two separate interviews, resulting in a total of ten interviews. Four of the participants opted for their interviews to be conducted via Zoom and one opted for a face-to-face interview. All interviews were recorded and transcribed through Zoom. The transcripts were reviewed simultaneously with the recording to ensure that the coded entries were transcribed correctly, and the participant's intended message was captured in the data analysis upon the conclusion of the interview. Each transcript was read through three times to gain a sense of the participants intended message prior to the official coding process. All the transcripts and recordings were stored in a secure, password protected UTRGV server.

The first round of coding occurred after all five of the participants completed their first interview. The resulting codes were stored on an Excel Spreadsheet, along with the transcribed entry from the participants interview transcript that was coded. These codes were organized by participant. Once all the interviews were coded, a second round of coding was conducted to identify commonalties between participants. These commonalities were based on the first-round codes and the supporting quotes to ensure that there was a connection between codes. All the

codes were generated with the phenomenon of becoming a secondary STEM educator in mind. In all, there were 312 coded entries, of which 267 were categorized into themes.

This categorization led to four central themes and five subthemes. The first theme was the value of education, which had two subthemes. The second theme, 'you don't' know what you don't know' focused on exposure and contained three subthemes The third theme was giving back and the fourth was reasons to stay. The third and fourth themes had no subthemes. Table 2 summarizes this information

Table 2

Themes and Subthemes

Main Themes	Subthemes	Total Codes
Value of Education		80
	Self-Sufficient	
	Support	
'You don't know what you don't know' – Exposure		151
	Family	
	School	
	Gender and Exposure	
Giving Back		19
Reasons to Stay		17

Value of Education

Throughout the first interview, all the participants reflected on the messages they heard and experiences they had that influenced their decision to go into the classroom. From family, to friends, to individuals within the education system, the data collected situates these individuals as playing a role in the decision made to becoming a secondary STEM educator. Hence, the first

theme I elaborate on is related to the first research question, which regards the positive experiences that led the participants, all of which were Hispanic females, to become secondary educators in a STEM field.

All the participants heard strong messages regarding the importance of receiving an education and discussed the involvement of their parents in ensuring that they saw that experience through. Ana, for example, recalled how her parents took her to school, prior to being of enrollment age in Mexico, just so that she could observe the lessons being provided to the older students, and as she went through her primary, secondary, and post-secondary education, Ana noted that her parents did their best to provide all that she needed to succeed in school:

> I did have their support, like, they will always give you, like, allowance for money to use or to spend, and, and I never had any, anything missing, like, I always have my supplies and things like that.

Erica, who also attended school in Mexico, was enrolled in a private school, and recalled how her family saw education as an inheritance to their children and emphasized the importance of the education they were receiving:

> They say that the only thing that they could actually give us was a college degree. They say that we're not millionaires. We're not gonna have, like, all these houses, so you have to study, and that's the way it goes.

Nancy heard a similar importance placed on education and like Ana's parents, provided what was necessary so they could accomplish that goal:

> My dad… he was very, like, 'you, you understand what you're doing? You do your homework?' I mean, they were very, you know, making sure I had the good grades, turning in my assignments and whatnot. They didn't offer additional educational support

> at home, but they were always on top of this, and if we needed to, like myself and my brothers, if you needed anything additional, they would provide us with resources like tutoring or additional, for those, like, like, reading programs, like after school programs, things like that. But, but they always stress that it was very important for, you know, for us to finish high school, and then, you know, go on to college.

For Marina, the message regarding the importance of her education came primarily from her mother, who had personal reasons behind pushing her daughter towards academically achieving more than she was able to:

> My mom, my mom, actually, she wanted ted to go to school when she was, you know, a teenager, but my grandpa did not let her. She wanted to go, and she wanted to become a lawyer, but she, she was, she was not allowed to do so. So with me, she did ask me. I remember it was my senior year, around February, March, and she asked me if I would, what college I was going to, and I told her, like, *pos*, I don't know and she's like 'What do you mean I don't know? You have to go to college. I don't care whatever school you're gonna go to, but you're gonna go'.

Additionally, Marina noted how, growing up, her mother was the one who voiced the importance of her children going to school and voiced her concerns whenever she felt a decision would jeopardize her children's education:

> As we were growing up, my dad's side, they don't value education that much. Well, at least not back then, at least not back then. Back then we were migrant workers, and on my dad's side they would take out, like my cousins, to put them to work in the field. Take them out of school. My dad tried doing that with us, but my mom told him no, she wanted us in school. So even though, you know, I mean my parents, ended up with less

> money compared to my other uncles and aunts, but I mean, she had a vision. She could not do it herself, but she wanted her kids to go to school. So I mean, she was strong in that way. It's like, we were not gonna go through the same thing that she had gone through.

Dalila heard a similar message from the maternal side of her family:

> My grandmother, my mom's mom was very much a, a push for education, a promoter for education because she only had a first-grade education. She barely knew how to write her name, and so when she came over, she felt very, very worried because she didn't have an education whatsoever. So she had to work in the *labores*, and so with her children, she was very much like, you need to go and get your education… So when my mom had me and my siblings, it was very much do better than us, keep pushing forward, you know, this world is constantly changing and you need to be as educated as possible because we are, you know, here in the valley, your grandmother came from Mexico. We need to make sure that we keep pushing forward to have a better life. And so education was always pushed to the forefront.

Dalila and Marina were not the only ones who received messages regarding the importance of education from their maternal side. Throughout her interview, Erica spoke primarily in terms of her mother, and the influence she ultimately had on her career choice. For Ana and Nancy, the message regarding the importance of education came from both parents, equally. This was confirmed during the member checking portion of interview 3. The statement they were given to was 'Majority of the messages regarding education and its importance came from your maternal side'. Dalila, Marina, and Erica responded in the affirmative and Ana and Nancy stated that it was both parents who provided this message.

The message regarding the importance of education was foundational in the rest of the experiences recalled by the participants that led them towards the classroom. The following two sub-themes follow directly from the message regarding education that was sent by the family of the participants and perceived by the participants themselves. In the following sections, I elaborate and provide evidence for each.

Self-sufficiency. The value that the families of the participants placed on education was not without consequence. Rather, these messages were supported by action and rationale. First, I focus on the rational provided, as it is just as foundational as the value placed on education within these families. Throughout the data analysis, the idea of being self-sufficient arose immediately after discussing the value that their families placed on education.

The participants expressed that their parents expected that they would be able to provide for themselves, limiting or eliminating any dependency on them or any other individual. Erica, for example, expressed that her family saw education as something that would allow her to provide for herself. She noted that the message she received from her parents were "along of the lines, of, you know, that your college is going to be something to help you." Ana noted that, for her, there was a message of doing things independently. In expressing how the message was portrayed, she mentioned:

> Just you, doing it yourself, maybe without, it could be without financial support, or it could be just because of your thoughts or your beliefs. You do it because you want to

For other participants, this message of self-sufficiency was intertwined with messages of breaking free from traditional gender roles. Dalila, for example, recalled hearing her grandmother's messages about being able to be independent, rooted in her own experiences:

> My grandmother always said people will come and go, but your education always stays with you, and that's cause of, you know, her siblings, who mistreated her when she was younger, and so what she thought would be her, like, safe space, quickly became toxic. And so that's why she came to America with my grandfather. She was very the proponent of make sure you can take care of yourself, because you never know, even if your own family… Do something that will help you take care of yourself. So if you ever do get married, you have the education to take care of yourself. If your husband leaves, that was something always said to me, if your husband leaves you one day, you wanna make sure you can take care of yourself and your children.

Nancy heard a similar message from her parents:

> So, because I was a female, and they're like, you know, we don't want you to, you know, need people, need no man. We wanna make sure that you can support yourself.

Marina reflected on what she was exposed to her in her family, and how the messages from her family connected to being an independent woman:

> We didn't have that, or at least, have that in, in, in, from anybody, from, you know, older than me. It was just like, okay, you're, you're, you're a girl, you get married, you have kids and that's' the lifestyle that, you know, we saw and I think that, I mean, it's still happening. That the majority of females we look at that and that's like the norm that we have to follow, but it's not necessary that, we have to break that… As long as you're able to provide for yourself, you're good. You've done your due diligence.

These messages of self-sufficiency led to the types of supports that the participants had when it came to pursing their intended career.

Support. Throughout the data analysis, support was intertwined with the educational experiences of the participants as they navigated primary, secondary, and post-secondary education. The support that the participants received was a key component in determining the career path of these participants. As they navigated through their primary and secondary education, the participants reflected on how education was valued within their families and provided the necessary support to ensure that they were able to graduate and ultimately attain a career. The participants also received support from individuals beyond the family unit. Friends and educators also played a supportive role that led to their motivation to become educators or their motivation to remain in the classroom.

Family support. One of the sources for support received by the participants was family. For Marina, support was "what has brought me to where I am. Otherwise I don't know where I would have been." This notion was weaved into the experiences that she told regarding her choosing to attend college and her post-secondary education:

> I consider myself one of the first, well, the first one to, to go to, to college. And as a matter of fact, I was not gonna go to college, even though I was, like, in the top 5% when I graduated.. I took longer than just four years, and there was a certain point, a, a certain time that I was not going to school, but she kept on telling me 'you have to go back, you have to go back'. And eventually I did go back. I mean she was there supporting me a 100%. I, I needed money, here it is. I needed this other thing, here… I was able to do it and finish with their support.

Initially, Marina was unsure regarding the degree she intended to pursue. She began with business administration, then changed to physical therapy, and ultimately decided on education. She noted that throughout these changes, her family was there to support her every decision:

> Yes, I, I felt supported. My mom did ask me, 'are you sure you wanna do teaching?' And she gave me this, like, look, like teacher? Because I was doing nursing before, like the… and I'm like, yes, I'm sure. But yes, I felt supported all throughout, right, by all my family.

Nancy noted that support, specifically, entailed "having that family support." Like Marina, Nancy began college with a major other than the one she graduated with, and originally intended to work in the medical field. Regardless, she felt supported in her decision to make changes and to continue to pursue her bachelor's degree:

> I didn't have to, during that time in my undergrad, I didn't have to stress about, you know, 'oh, am I gonna be able to afford it?' I, I, that wasn't my worry. Emotionally, them being there when things, you know, when I wasn't successful on an exam, or on a test, and telling me, 'hey, it's okay. You just keep at it. Next time you'll get it.'

Ana noted that, for her, support meant "having a team, having somebody, not pushing you to do stuff, but you know, encouraging you to pursue what you want." True to her definition of support, Ana noted that "they were always there for me" and when reflecting on her career choice, Ana noted:

> And then while having my family with me, knowing that they will support me in any way that I want, so that, that's also, like, a big impact into that decision.

Similarly, Dalila noted that for her support meant "just simply having people that are constantly there for you, no matter what." From a young age, Dalila recalled being supported in the decisions she made regarding activities:

> My uncle, the mechanic was like, 'you can do whatever you want', like, ' you wanna learn about space, learn about space, you wanna work on the motorcycles, let's go work on the motorcycles, let's go work on the cars'.

Her mother instilled in her that "'our family should be here to raise you up and help you become a better human being, not tear you down'", a message that she mentioned she used to create her own support system as an adult.

When asked about what support meant to her, Erica flatly said, "Parental support. Encouraging children's decisions." She recalled how her family had already mapped out her post-secondary education, and did not want any deviation from that plan:

> My parents were really, like, since they were so strict, they wanted to choose our careers. They chose my brother's career which is, he's a doctor, which is good, right? Good for him, but he wanted to do something else. I was supposed to be a lawyer, and I was like, I don't want to do that. So they forced me to like, do the political, criminal justice… I should've just finished engineering, but I had no, like, parental support… They cut me off right away when they found out that I was doing something else.

Erica further elaborated that when she decided on teaching, it came with confrontation and a negative message:

> You know we're paying your, your career and you have to be what we're telling you, and if you're gonna become a teacher is because you want something easy. Teachers are not respected, teachers are, that's not a good career. It's not a good occupation, it's an embarrassment to be a teacher

Apart from Erica, the participants were given the support to pursue whatever career they had selected, indicating that there were no limiting expectations being imposed by family.

Friend support. While support received from friends was not dominant in the data analysis, it was key to two of the participants and their career choice. Erica, for example, noted that while she did not get support from her family, having the support of a friend would have changed the trajectory of her career path:

> You know, thinking about it, if I had someone like [Coworker A] with me in the engineering program, I would have stayed. I would have actually stayed.. I knew it was something I could do, I just needed someone who was there telling me I could do it.

Regarding the support she received from friends, Dalila stated "my friends would encourage me to continue whatever it is that I wanted, because we were all real supportive of each other." Later in her interview, when she recalled contemplating whether she should choose an alternative career instead of continuing to pursue medicine, she reflected on a conversation she had with a friend, and the subsequent actions of that friend that allowed her to feel confident in her decision to become a teacher:

> And so that helped me a lot when, you know, I was depressed and when I got anxiety, and you know all of that fun stuff in college. They were the ones that help pull me out of it, and it was like 'this was your dream. This has always been your dream, but you know it's okay, if you don't, if you don't want to. It's okay if you don't' feel like you can do it anymore'… And so I remember, actually, if I'm not mistaken it was my mom who had, who had first suggested I should be a teacher, and my mom works in the district, so it makes sense she would say that and I remember being like, 'no, I don't want to, like it's the district, like you're there, I don't want to work there'. And then I had this conversation with [Friend B], because [he] and I were roommates, and he was like, 'why not?' He goes 'you like to talk, obviously, and you like science and you are the weirdest

> person I know. Why don't you do science teaching?'… He goes do it for a year, and if you hate it then leave' and I'm like 'bet, I'll do that', and so… I eventually got my, my teaching certification, started teaching, and was like, okay, 'I can do this', and I remember him calling, like, every week to check on me.

To ensure that the message regarding support and self-sufficiency were the intended message of the participants, they were asked whether the following statement resonated with them during the member checking portion of interview 3: 'Your family was supportive of whatever you would have chosen as a career, as long as, in the end, you were able to provide for yourself and not have to depend on anyone else to survive.' Erica was the only participant to did not find this statement true. As a follow-up, I asked Erica whether the support of her family would have allowed her to pursue engineering, as she originally intended, and she stated, 'yes, definitely'.

You don't know what you don't know

This theme was a result of the participants responses during the first interview and further solidified within the second interview during the data collection process and member checking. The name of this theme followed from the original In-Vivo code used in the initial round of coding and captures the essence of how the participants ultimately became educators in the STEM field instead of pursuing a different avenue. The three resulting subthemes— family, school, and gender and exposure—were factors identified by all five of the participants as central to their decision to go into the teaching profession.

Each of the participants discussed what types of careers they were exposed to and how or who exposed them to these careers. All of them noted that their exposure to different careers within and outside of STEM were limited and were introduced to them through family, school, or a school sponsored experience. The additional subtheme delves into how gender was a factor

they observed when choosing a career. These categories deal with the experiences of the participants and how they ultimately played a role in the selecting the teaching profession.

Family exposure. The participants note that within their family, there were exposed to only a few careers, if any. Ana, for example, recalled that her family did not direct her towards anything specific or offer suggestions regarding which careers to pursue. Instead, she just recalled the open-ended support she received to pursue whatever she enjoyed:

> They always tell me, 'just make sure that you do whatever you want, but make sure that you did it with heart'. As for far as they pushing me into going into something specific, I don't think they, they ever did that. They always left that choice for me.

Nancy heard a similar message from her family:

> As for me, going into, but no, they, they really, they, they didn't, they're like, 'you know whatever you like, just make sure that whatever it is, you know, that you wanna go into, is something that you do like'.

However, Nancy had a rudimentary understanding of the education field due to a family member who was in the education field:

> There was the education part, was, I had a family member pulling that route, and I'm just, I knew it was something I wanted to do, something that, it, I wanted to work with people.

Like Ana, Nancy did not hear her parents direct her towards certain careers or point out any possibilities. Nancy stated that her parents both worked in the car manufacturing industry in the assembly line. For her and Ana, their exposure to potential careers from their parents came down to what they did for a living.

Erica was exposed to specific careers while growing up and were aligned to the expectations set by her parents. Her parents were both lawyers who expected that her and her

brother follow pre-prescribed career plans. Erica stated "I had to be a lawyer, doctor, you know, those careers." She continued to state that the medical field was also one that had been pursued in the family, hence explaining why her parents expected her and her brother to go into either field:

> Honestly, my parents were lawyers, and I will see what they would do in a, I should know, it's not my thing. Like, I, I just don't like it. I don't' like the fact that you had to take a side even though it's wrong, and I didn't like it. And that's the main reason I didn't want to go into law… My grandpa is a, is a doctor, that's why my brother is a doctor.

Through a vicarious experience, Erica was able to decide that the career that was selected for her was not the one she wished to pursue.

Even though Marina expressed an interest in nursing from a young age, she specifically addressed the limited discussions that existed within her family:

> I had several, I had something like, 'oh, maybe you should go like into nursing' because I've always liked nursing, and like, you know, caring…I didn't see too much, as well, or hear let's find more information on it, or let's, you know, do some research, or let's, let's see, or let's talk to people that work in that field. That did not happen because we didn't know anybody, you know, personally that, that worked in those fields… I went into college not knowing what I was gonna be. I started with business administration, just because I needed a major, to choose a major.

Dalila did have more exposure to a variety of occupations than the other participants, but she still notes that it was not sufficient. When deciding on a career, she stated,

> Honestly, the only thing I ever thought about doing just because I was around it a lot, and no one ever told me to try for something simpler. I kept saying I wanted to be a doctor,

but it's cause that's what I was around, like, that's what, that's what I was exposed to, right? Cause exposure is really big as kids. That's what I was exposed to is doctors.

She did note that her father made an effort to introduce her to the professions he was familiar with through his own job

> I was exposed to a lot of different science stuff, like science professions because of my father. My dad, when I was younger, he, he, worked with GE in aviation, so he will work with the airplane parts. I would go to his work, and I would see all the interior components of engines laid out to be worked on, cause there was something messed up, like something was wrong with it, and they had to figure it out and try not to, you know, destroy it in the process. So I was exposed to a lot of engineering in that sense.

Moreover, since her mother worked for the school district, Dalila noted that she had a wide range of career exposure within the district:

> And then the school district. So I was around this school district, since, I was a child. So I was around administrators, secretaries, bus drivers, cafeteria ladies. So I saw a wide range of things within the district itself.

Dalila wrapped up her discussion on exposure stating that "I was very sheltered, so my exposures were limited to what my family was exposed to."

Again, except for Erica, the participants were not bound by career expectations set by family. For all the participants, however, the exposure they got on behalf of their family was limited to what family themselves were familiar with or surrounded by.

School exposure. When it came to exposure to different careers during their educational journey, the level of exposure that each participant varied. For a majority, there was limited discussions with teachers and counselors regarding what careers would be beneficial or

compatible with the participants. Some participants, however, gained an opportunity within the secondary school setting that opened the doors towards considering education as a career and for others this experience happened during their post-secondary education. For example, while Ana did not hear specific messages regarding career possibilities, she was given the opportunity to experience teaching as a high school student. Ana stated "Sometimes I will hear, like, oh, you can use this like in economics, or you can use this," indicating that the exposure she gained within the school setting was limited. However, Ana did note that she was provided an opportunity that opened her eyes to the possibility of becoming an educator:

> Teachers that have us do voluntary tutoring, and I remember my senior year, there was a group of students that were selected to tutor students that failed the TAKS back then it was the TAKS right? And we were actually trying to help these students pass and we, we had like little rotations. We were teaching, or we were in, in math classes and then after that we went on to the science classes to make sure that the students understood the questions and how to, how to pass the test. So I think that they did, it impact me because I was like 'Oh, I can do this, I can help, I can help you know', like, I was like 'oh, my', and I felt really happy like seeing like how they they understood the material.

Marina recalled having conversations with the Health Occupations Students of America (HOSA) teacher, but did not recall having conversations about the possibilities available to her beyond that:

> Just maybe the HOSA teacher, because I was in HOSA. But other than that, no, I, I didn't, like, I didn't even go talk with my counselor or anything like, I don't remember who my counselor was… I don't even remember talking to my counselor. I just did the FAFSA on my own. I had to have asked where I heard about the All Valley Scholars,

and then I applied. That's the only scholarship that I applied for cause I heard about it, and I guess I have missed the deadlines for all the other scholarships, too, so I guess so. But no, I I don't remember like the teachers told me go for a math or go this or that.

Once in college and in a physical therapy program, Marina did have an experience with education that allowed her to immerse herself in what teaching is about, providing her with an opportunity that solidified her career choice:

> I started working at an elementary school and that's what made me change that last time. It was an after-school daycare at the school, and it was, we had like a little, it was not a lesson plan, as far as us teaching, but we broke what it was like. Two hour's worth of, like the time that they were there, the students. We broke it off into different, the time we broke it off into different activities, and we're rotating with the different groups because it was like Pre-K students to fifth grade students. So it was not too much direct teaching, but I liked the, I liked working with students… When I started working at the daycare, at the well, actually it was, it was sat school, I wanna say that that's what made me like, 'Okay, this is what I want', and I mean that's the reason, that's, that's where I saw myself doing teaching.

Nancy felt she was exposed to more through the elective courses offered at her high school than she did through additional opportunities or discussions with counselors:

> When I was in high school, they did, I mean they would focus on, okay, nursing, or law. But there's just so much more, and I feel that they didn't, like the counselors, so much or gave us the opportunity to, well, see everything that's out there. Teachers, no, it was one of the classes that I was in. It was like medical terminology… I started late so I didn't get

much, I didn't end up.. yeah, because when I went into that class and I really did enjoy it, it was already in, I was a senior.

During her college years, however, Nancy had an experience similar to Marina's. She was able to work with an educational institution that allowed her to experience the classroom, providing her with the exposure that ultimately led to her decision to become and educator:

> I was given the opportunity to do like a shadowy, shadowing, going in to help out at the elementary school, and that's when I decided to go into SPED.

Nancy also discussed the experiences she had with two different educators that motivated her to go into the classroom:

> I had one teacher who made it very difficult. I just didn't understand, I didn't understand what the teacher was doing. Maybe that's where I see, like I didn't get it, but then went I went into college, and then had a professor that explained and broke things down and did things step-by-step, I loved it. I loved it. It makes a difference… I don't know, maybe I have a better understanding, though, you know some things about how my students, they're not going to understand the way when teacher presents, but you give it time and break it down, you know, they get it.

Additionally, she had the opportunity to become a paraprofessional at an elementary school. Like Marina, this experience allowed her to see that the classroom is where she wanted to be:

> When I got that job as a paraprofessional, and I said, you know what you like, this is for me. I just really really enjoyed working with the students.

Erica noted that the exposure to different careers was as limited as it was at home:

> But when we were in high school, when I was in high school, so there's only these 3 careers, like pretty much. They do career day, and I honestly just saw like these careers,

like morticians? I wouldn't do that, exactly.. Doctors, lawyers, entertainers, singers? I mean, come on. Like, the standard careers that you were exposed to were what you saw.

Within the classroom, Erica's teacher saw her potential and steered her toward engineering.

> The reason I was choosing engineering is because when I was in high school, and I was doing good in math, my math teacher was 'Do you know there's career related to math?' and I said 'like which ones?' and he told me engineering so I started like looking into things.

This particular educator was inspirational to her. Erica noted that he was memorable since he was able to accommodate his students and provided a welcoming, supportive environment.

> He was my precal teacher in high school, and there were some things that I couldn't understand and someone the way, he would teach me, I was like, oh, I got it. It was like that, I see him every now and then. I'm like 'I became a teacher because of you'.

Additionally, school provided her an opportunity to broaden the horizon of known engineering paths by providing her the opportunity to attend a camp at Texas A&M University at the end of her senior year.

> Cause I remember when I graduated, before, we went to this camp at A&M and one of them, she was gonna be an astronaut, and I ask her, what is your major? And she's like, astronautical engineering, and then I was like, what? What's that? I didn't know they had those engineers in there. Yeah, they had all these engineering programs that you could go into.

This opportunity inspired her to initially seek a degree in engineering. Although things did not work out how she expected, this experience led to one of her motivating factors for entering the classroom.

Dalila was part of a GEAR UP cohort, which provided many opportunities to students under that grant to explore different opportunities.

> I was part of, like, the Latina STEM programs where they would take us to [the local university] at the time, and shove us in the gym and learn about, you know, the engine, the female engineers and all the female driven companies in STEM.

Additionally, Dalila reflected on the great communication she had with a particular teacher. Like Erica, Dalila grew to admire this educator who inspired her to go into the classroom when she made the change from medicine to education:

> Miss N was the one that looked at, talked to me one day and was like, 'you know you do good in science. Your scores area always really good,' she's like 'but you just need to stop messing around and focus on a science'… she's like 'you just need to focus on what you want in life'. The reason I knew I want that, I could do teaching was because of her… I grew up thinking I wanted to be a doctor, and then when I got into college and I started doing my science courses, it was like I could do this, like Miss N, Like I wanna be like Miss N, where she made it different, and edgy, and cool, and made more relevant things and talked about herself. She wasn't this image, she was human.

This theme was captured within the first set of interviews. During the second set of interviews, participants were asked if the following statement resonated with them: Perhaps one of the reasons you did not consider alternative fields is because you did not have an early enough exposure to those career fields. All the participants answered yes. This indicates that education was a career they were exposed to and was seen as a possible career choice when narrowing down their choices.

Furthermore, it is important to note that all the participants had an informal teaching experience or had influential interactions with an educator who allowed them to see a beauty in education. To determine whether this was, in fact, the case, participants were asked if the following statement resonated with them: Prior to becoming a teacher, you either had a positive informal teaching experience or admired an individual that inspired you to be that person for others. All the participants answered yes. Of the five participants, three had an informal teaching experience, and two of them had a teacher who provided a positive example, and one of them identified both as key inspirations.

Gender and exposure. Participants note, however, that gender was not vocalized as a limiting factor by family, school, or any other source. Rather, gender differences were noticed through observation of what they were exposed to by family or school. Dalila, for example, noticed that there were certain fields where females were not present or as prominent as men:

> Like, it was, it was, you would see it, not just in our TV shows, but you would see it in real life. Seeing all the women usually doing what are considered female jobs, like secretaries, like nurses, like small medical staff. Small things and men would go off and do these big great adventure jobs, and you were just supposed to live like that, and I was very fortunate that I had the family that I had that didn't force that on me because it allowed me to be like, I can do what I wanna do, and that, you know, kept from, I guess, going down a much different path that I could have.

Through GEAR UP, Dalila was exposed to the rationale for certain events and how it connected to her observation:

> I remember one of them. My mom got to go and I was sitting with my mom and she's just staring at these women like, like 'They're amazing! I can't believe that there are

> women there, they're Hispanic women, Latina women here who were doing these things. This was unheard of, you know, decades ago, and I was like, 'Really? Like, what do you mean?' She goes, "why do you think there's an entire day just for girls?' I was like? 'I don't know'. She was like 'because girls don't go off into those professions'.

Moreover, Dalila noted that these ideas and observations influenced her decision to want to enter the medical field:

> I guess this is like, you know, things that girls don't' do, like engineering isn't a big deal or like, isn't a girl, a girl occupation. But doctors. There were girls everywhere. There were girls that are nurses. There were also secretaries, CNAs, and then you would have female doctors. So that was something that I felt like, oh, okay, I can do this, like there's other people here, like there's other girls here to work with. I think it's that idea of being alone, of not wanting to be the only girl in the area that was daunting.

Erica's interview echoed this notion.

> I remember, like I was , like when we were over there in, in A&M and they were all guys. I was with all guys there, and they were talking about these careers. Yeah, I mean, the girl for astronautical engineering, she was the only girl in the field… It was kind of intimidating to see all the men, but it's just a few of us.

Marina had similar thoughts regarding gender and career choice:

> There is like, and one thing, one thing that I've always thought about, you know myself and I'm pretty sure that there's a lot of other females out there in the math field or math and science and it's predominantly it's it's, you see men. So you well, I automatically thought I was not good enough for these things… You grow up seeing those things, and it's like your brain is conditioned some certain way, because you see it. You see it, you

know having you see most of them. If most of the people are men so it's men, it's a man's job.

This led to doubt when considering challenging the mathematics content exam to teach high school students:

> I remember seeing like the courses for high school and I'm like 'Am I gonna be like doubting myself, doubting myself again because it's like math where like, guys, men are doing these, these type of things?'

For this subtheme, participants were asked whether the statement 'You were not limited in what you could do or turned off by different careers due to your gender, but due to lack of exposure' resonated with them. All the participants said yes, indicating that even though they observed a gender bias, the message of inability to complete due to gender was not a prominent one heard from their support system.

Giving Back

This theme addresses both the first and the second research question. The participants expressed that their experiences with career choice and support were motivating factors to go into the secondary STEM classroom, as well as provide a reason to remain in the secondary STEM classroom. For Erica, teaching mathematics was aligned to her original career goal of becoming an engineer. Reflecting on the lack of support and exposure she had, Erica stated the following:

> Because I know what it's like. Most of them don't have the support, like I hear every day and it's not the same type of parents, right? They, they're different, but I know they don't have it. And they have all these dreams and ambitions, and if you hear them talk, they're like, 'I don't know if I can do this and I wanna go there'. I tell them, 'You're young like,

> you can do it! Go to college, do the…' Some of them, my, seniors are graduated, they're like 'I really wanna go to college'. 'Okay, let's go. How can I help you?' And I help some of them fill in their application, like, go. Don't screw up. Just go.

When asked to think about our discussion, and the various factors that could have played a role in her career choice, specifically those that led her to become a secondary teacher, Erica stated

> I knew that I could influence other people, like, 'You could do this, or could do that', or, you know, he, you know, you can find these, and you know there's these careers, because nobody tells you. Honestly when I was in high school, even my whole life, they're just 3 paths that you have to follow. Is either those engineers, or be a lawyer, or be a doctor, like you don't know all these fields. Like, I was like, 'Oh, there's so many things out there that you can do with your life, and I see them so young that they can be, like you still have time.

Marina knew she wanted to do mathematics because it was the subject she felt best about, yet she recalled doubt as a driving force in contemplating whether she would do middle school or high school teaching

> I remember when I was a college student and I was, I said I'm gonna change it, I'm gonna change to math. I remember thinking that, I remember thinking, 'okay, is it going to be middle school or high school?' And I remember seeing like the courses for high school and I'm like, 'am I gonna be like doubting myself doubting myself again?'

However, after working with secondary students as a permanent substitute, Marina realized it was a population she liked to work with:

> I remember thinking that, and, I'm like 'oh my God, is it super bad? These kids are going to be horrible', and then I remember walking in and doing my first, my first subbing there

and I'm like 'I like this environment, I like these kids, and actually I have blended in very well with these kids'.

Marina chose the secondary mathematics classroom because she feels wishes to empower her students and help them eliminate the doubt that she had during her experiences with the content:

> But it's always for me, as a student, I like learning for me as a student, even right now I like learning new things. I mean, what are we gonna do without learning? I mean we keep on learning and I'm not necessarily only talking about math, you know you learn about history, learn about other things, and not only in the classroom, out in, you know the real world. There's things that you can learn about. So is there anything about, you know, math and, you know solving things and it it it it gave me, when I found the solution after several attempts that I was not successful, that felt very good. So I told my students when you were a able to do that, even if you fail once you fail again, you fail again, but then you take a break, you go back and that's fourth, fifth time you try it again, you get it, that feeling no one's gonna take it away. It's a very good feeling and it's just you know that feeling that takes you to do more things like it makes you feel capable of doing other things. It's more like it, give you power, empowering a way that you feel like you're able to accomplish other things as well by doing that.

When discussing moving into secondary education, Nancy noted that she received the guidance of the principal overseeing her when she was a paraprofessional:

> He just, we have spoken a few times. He's like, he just told me 'I think you have the personality to work well with these older kids, and I think you get along with them' even though at the time I was 24… 'but then you're not that young they'll respect you and and you just have communication, I see how you', you know, we talk to others.

Regarding moving into mathematics, Nancy reflected on her own struggles and her experience during her pre- and postsecondary education and how that allowed her to create a more positive relationship with mathematics, motivating her to do the same with her students:

> I like to build relationships and I, and, but, in the teachers that did do that, really, I, the teachers that you know, really did, I guess provide more than just a lesson to the students. Those are the classes that I enjoyed the most like, for example, I hated math when I left high school, and I started at the very basic, basic level when I went into the university, and man, those two teachers. They really made a difference, and I loved it.

Understanding the importance of building relationships, Nancy states that she attempts to establish to recreate that environment for her own students, providing support and relevance to the material she teaches:

> That [building relationships] is the most important out of everything, more to me even, yes, the academic. It is important. But once you build a relationship with the student, I think you can get more out of them. When they know you respect them, they know that you care for them that you genuinely care for them and are there for them, and they're willing to give you 100%, like I've seen that with with the kids this year year, having them, and even years prior in, in inclusion classes. There is, you know that building, I guess every every every period building our little community in there. I have enjoyed it.

For Ana, secondary science education would allow her to provide her students with more hands-on experiences with the subject she enjoyed:

> Science is a really involved subject. You have in there math… it's like really lively, I get really involved because you can explain something, and you can show it and or have demonstrations… As far as why did I go into secondary education? I think it was because

> I was trying to get the students that were a little more mature that could probably, I wanna say, not comprehend? But can kind of view things or or be able to to explain to them.

She also saw the relevance of her subject in other career fields and wanted to ensure her students were also exposed to these career paths:

> There's so many branches from those two subjects [science and math] that they can go into, you know, like if they want to. They can go into engineering, they can do, they can become doctors, they can become dentists, they can, I don't know, they can become, they can become anything if they put their minds to it. You know they have it, they they have so many things, so many pathways, using these two fields. So sometimes, and I and I get a lot of students that will say, 'Miss, what do I need this for?'… But down the road, or or once once I went through college right? I could see, like all the different ways that they could, that they could do, or that they can do like they can become geneticists, or they can become, I don't know they they can be scientists to to discover something or or to elaborate like a new medicine or or anything. So I tell them 'Guys don't just be inside like a little bubble that that you can only do so much stuff. Like you, you can, you can become something else, and and and going to so many different fields'.

For Dalila, recalling the environment set by Miss N aided in the decision to head into the secondary STEM classroom:

> She didn't push me to become a teacher but she did do a lot of things that made me go 'that could be something that I could be like and I would be totally fine with it'. Like, I, if I grow up to be half the way Miss N was to me, I will be happy. And, I, with that notion, I applied for my ACP program about like 3 months later.

Additionally, in reflecting on her experiences, Dalila stated that in her classroom, she serves as a role model and a mentor:

> We are a science department of 4. I am the only female. A lot of girls don't like getting into the sciences. They don't look, necessarily think it is a profession for them because they are not, you know, represented and so I think that I've always been about is role modeling the love of science, role modeling just how to behave as a human being, as a compassionate human being. And then just trying to help students succeed. Like my thing is always I want to be a mentor and not a pusher. I don't know what the right word is… but I want to help push my students to become more than they think they can become. I feel like we sometimes close in on ourselves once we realize, oh, this is my mom, she does this, my dad does this, I'll just do this too, and we kind of limit ourselves.

Like Ana, she did not want them to exist within a bubble and desires that her student explore the world so they are familiar with what's out there, career and otherwise:

> We, as a community, we like to think that we are isolated because we are so physically isolated from everything else. I think that as a community we especially because we are predominately Mexicans, we don't have this same, I don't want to say concern, but we don't have the same type of difficulties that we see in other cities, because we are so homogeneous and we become complacent in that. I, I never would have said leaving the valley would be a big thing for me, and as I got older, I was like, wait a minute, the whole world isn't the way it is here?... I like to kind of push them into doing those trips because if not, you don't know it's something, you don't know what you don't know, and I don't want them to be caught off guard because I was caught off guard… and I don't

want them to be caught off guard because that's a horrible experience, and I don't want anybody to experience that.

Reasons to stay

This theme addresses the second research question, namely, the opportunities and experiences that lead participants to remain in the classroom. Participants were questioned on experiences and opportunities that exist within their profession that result in them remaining in the classroom. All the participants described experiences that related to support as reasons to remain in the classroom, particularly that of which came from their colleagues.

Ana, for example, discusses the growth that she has had since she started, and how a collaborative environment with other educators allows her to continue to grow:

> I like my team. I love being around my team. I think that you know, at the beginning I had a lot of problems with classroom management, right? I was on, you know, and I become better every year.

Marina also stated that a collaborative and supportive environment was key to remaining in the classroom:

> If you don't feel comfortable with, you know, co-workers, you're not gonna have that drive to to stay there or if you don't feel this support of administration with, you know, how you're handling your student, well, that's another way, another reason why, you know, me as a teacher, I wouldn't want to stay because I want, you know, I, I want my authority to be right, and if it's not happening, well, then I'm not going to be comfortable enough to stay. I'm going to look for change. And so I think, yeah, those those 2 things are very important for me to stay.

Ana also looked towards her colleagues as a reason to continue in the classroom:

> I will say, you know, the type of people that you work with…Hmm. Well one of the things that I've seen is that you need to collaborate with with your colleagues, with your teachers. There has to be an open communication on what you do, and that way you can grow and improve on your teachings.

Nancy specifically mentioned support from she receives from administration as a reason to stay in the classroom, stating:

> This support, those support from the administration, I think. My, I really enjoy what I do, and if the support is there, that makes it a lot easier, I think to stay. The leadership that we have at the school that makes a, I mean that makes a big difference.

At the end of the second interview, participants were asked if the following statement resonated with them—A collaborative or supportive environment among colleagues, not necessarily with administration, encourages you to remain in the classroom. All the participants answered yes, and Nancy stated that both were ultimately necessary as factors that allow her to remain in the classroom.

Summary

A description of the participants, how thematic development occurred, and the results of the data analysis were presented in this chapter. There were four themes that were presented—the value of education, 'you don't know what you don't know' – exposure, giving back, and reasons to stay. All four of these themes outlined the lived experiences of the participants and relate to the two research questions: (1) What are the positive experiences that encourage Hispanic females to go into STEM education? and (2) What learning opportunities and experiences have kept Hispanic females in STEM education?

For the participants of this study, the support, or lack thereof, received from a central support system played a driving role in career choice. The support demonstrated by family specifically was intertwined with the expectation that the participants be self-sufficient. The decision to become a STEM educator at the secondary level was further influenced by the careers the participants were exposed to. All the participants had limited exposure to the various career fields available. Within this exposure, certain experiences, such as an informal teaching opportunity or a positive experience with an educator, called the participants attention to education. With knowledge of the influences of their experience, the participants entered the classroom and remain in the classroom knowing that they play an influential role in the decision of future students. Moreover, they remain in the classroom due to the ongoing support they receive on behalf of colleagues, both non-administrative and administrative. Chapter five provides a discussion of the findings of the study, as well as identifies and elaborates on limitations and implications of this study.

CHAPTER V

DISCUSSION

The purpose of this chapter is to weave the results of this phenomenological inquiry to create a cohesive response to the research questions. Additionally, the results will be connected to the literature to discuss how this research adds to the body of existing literature. The limitations, implications, and recommendations for future research will also be discussed.

Summary of the Study

Hispanic females are disproportionately underrepresented within STEM fields (Census Bureau, 2021; Martinez & Gayfield, 2019; National Science Foundation, 2021). While there are various factors that hinder this specific population from entering the STEM workforce, the literature identifies role models and representation as motivating factors for females and underrepresented groups in entering and persisting in STEM-related fields (Martin & Fisher-Ari, 2021; Sahir & Waxman, 2021; Sahir et al., 2017; Tey et al., 2020). As students, Hispanic females are routinely exposed to educators that could provide this representation and act as role models. Hence, the purpose of this study was to investigate the positive experiences that have encouraged Hispanic females into the secondary STEM classroom, as well as the experiences and opportunities that have allowed them to remain in the secondary STEM classroom. The following research questions guided this study:

1. What are the positive experiences that encourage Hispanic females to go into secondary STEM education?
2. What learning opportunities and experiences have kept Hispanic females in secondary STEM education?

To address the research questions of interest, a phenomenological inquiry was applied since said inquiry "seeks to explore, describe, and analyze the meaning of individual lived experience" (Marshall & Rossman, 2016, p. 17). This phenomenological inquiry was conducted to explore the lived experiences of Hispanic females that led to the decision to become educators at the secondary level. The five participants of this study underwent two interviews. Each interview was transcribed and coded. All resulting codes were then organized to generate themes that address the research questions. The findings will be elaborated on in the following section.

Summary of Findings

The analysis of the data resulted in four themes and five subthemes relevant to the research questions of interest. Three of the four themes addressed the experiences of the participants as they pertained to research question one, namely the experiences that led them into the secondary STEM classroom. Two of the four themes addressed the experiences of the participants as they pertained to research question two, namely the experiences and opportunities currently allowing them to remain in the secondary STEM classroom.

Regarding the experiences that allowed educators to pursue a career in secondary STEM education, the first theme pointed towards initial messages the participants received regarding career choice. From a young age, there was an emphasis placed on education in general, hence the naming of the first theme, the value of education. For all the participants in the study, education was seen as a key to a better future. This was evident through statements such as, "We

need to make sure that we keep pushing forward to have a better life, and so education was always pushed to the forefront," which was made by Dalila regarding the role education played in her family. Nancy and Marina echoed similar statements regarding the message their heard from their families regarding why an education was so important. Erica noted that for her parents, education was analogous to an inheritance, stating that when it came to education, her parents would say that it was "the only thing that they could actually give us was a college degree."

Further analysis revealed that the purpose for this message so that the participants would be self-sufficient adults, leading to the first subtheme under the theme value of education. As the key to a better future for the participants, families saw education itself as a means for the participants to pursue careers that would allow them to support themselves in their adult lives, without having to depend on any other individual to take care of themselves or pursue their dreams. For some, this message was intertwined with ensuring that the participants would deviate from traditional gender constraints. Marina, for example, recalled seeing the females in her family aspiring towards marriage and families, yet was encouraged to pursue a higher education. Nancy noted that her family specifically emphasized that as a female, she should be able to take care of herself, stating "we don't want you to, you know, need people, no man. We wanna make sure that you can support yourself." Dalila heard a similar message from her parents, stating that she was told that her education was a means to support herself in the event that her husband or family were to leave her.

To this end, the participants received support throughout their education, as well as when it came to their career choice, leading to the second subtheme, support. For four of the participants, support was unconditional and observable throughout pre- and post-secondary

education. Moreover, for the participants who changed their mind well into their post-secondary education, this support allowed them to feel at ease with their decision, ultimately leading them into the secondary STEM classroom. In relation to career choice, majority of the participants noted that there was no emphasis on specific careers, and that their parents were supportive of the careers of their choice. Ana, for example, stated that her family "always supported me. They always tell me, just make sure that you do whatever you want, but make sure that you do it with heart." Additionally, she reflected that "as far as they pushing me into going into something specific, I don't think they, they ever did that. They always left that choice for me." Nancy echoed this sentiment, stating "No… they're like, you know, whatever you like, just make sure that whatever it is, you know, that you wanna go into is something that you do like"

For the participant who did not have her parents support regarding her career choice, it resulted in detrimental to her chosen career path, leading her to feel like she had to choose a career path that would allow her into the work force sooner rather than later. Erica noted, however, that in the absence of parental support, support from a friend would have allowed her to remain in the field, stating "You know, thinking about it, if I had someone like [Coworker A] with me in the engineering program, I would have stayed. I would have actually stayed.. I knew it was something I could do, I just needed someone who was there telling me I could do it." Dalila echoed a similar sentiment when stating that her friend was key in helping her decide what she should go into once she made the decision to stop pursuing a medical degree and seek something different. Hence, family support was not the only support cited as crucial to their career choice. Support from friends also proved to be crucial as the participants made career-related decisions.

Exposure was the second theme that became evident as crucial to career choice. Exposure to different careers came from two main sources: family and school. Specific opportunities within the school setting allowed these participants see that they were destined to go into the classroom. Marina, Ana, and Nancy, for example, all experienced being an educator prior to making the decision to become a secondary STEM educator. Marina, for example, stated that "I, I would say that when I started working at the, at the elementary school, that's what made me change. And it was like a more solidified change." Ana noted that her experience tutoring high school students led her to see that education was the route she wanted to follow.

For Erica and Dalila, it was experiencing a supportive, caring educator that allowed them to see themselves as educators. Erica recalled a mathematics education that inspired her to be an educator, reflecting on how he encouraged her to look into mathematics-related careers such as engineering. For Dalila, it was an educator who showed her that learning does not have to be a rote practice and that educators serve a greater purpose than just delivering lessons.

All the participants, however, reflected on the limited range of careers they were exposed to growing up. Moreover, they stated how, had they been exposed to different career paths, it could have changed their trajectory of career choice. Dalila, for example, stated the following regarding not considering careers other than education or medicine, "The reasons why I did not go into those, into those professions is because they were so unknown to me," Marina did note that if she had the exposure to a field such as engineering, she may have gone that route due to her interests, stating "I'm just, you know, thinking, maybe I would have gone a different route, through you know, engineering… I would like to, I don't know, create things, be able to create things." Hence the exposure that the participants received limited the scope of their options prior to deciding.

Additionally, the participants were exposed to factors related to gender that also limited their scope of interest in certain fields. Marina, for example, recalled thinking that certain fields were not for her because she was a woman. Erica recalled going to a camp at A&M where she was first exposed to her dream career, aeronautical engineering, but noted that there were not too many females speaking about their experiences in engineering, stating "I remember, like I was like, when we were over there, in A&M, and they were all guys. I was with all guys there, and they were talking about these careers. Yeah, I mean, there was like a girl, like the one from aeronautical engineering. She was the only girl in the field… there's a lot of men. It's just, like, a few of us."

The final theme that led these participants into the classroom was the idea of giving back based on their own experiences. They wanted to influence and create a supportive environment in their own classrooms to promote the same opportunities that they got, or those that they lacked. For Ana, for example, going into the classroom was an opportunity to expose her students to the different careers they can go into that are heavy in science and in math. Nancy elaborated on her experiences with a supportive and non-supportive teacher that encouraged her to play a supportive role in her own classroom so that students were motivated to learn. These notions were also emphasized by the rest of the participants in this study.

This same theme also addressed one of the reasons that the participants chose to remain in the classroom. In discussing their choice to remain in the classroom, participants cited the same reasons. Dalila, for example, stated that while she dreads the administrative portion of teaching, such as paperwork and meetings, her reason to stay is so that she can "keep helping these kids do better and be better people." In recalling her own experiences regarding lack of exposure and support, Erica stated, "I think when I've talked to these kids, they just told me, like

starting careers, they don't know all that they can do... so I'm like, 'it's not about actually people telling you, it's about you discovering what you want to do, and I mean, I discover it because I went over there [to A&M]."

The last theme that arose related to factors that facilitated these educators' decision to remain in the classroom. Collegiality was a prime discussion point from each of the participants and superseded any other factor. All the participants noted they were currently part of a department or a close group of colleagues that supported them and challenged them. Erica felt strongly that this support was key to her surviving her first year and continuing to remain in the classroom, stating "They will help you out whenever, like, you're lost, it's like friendships that I formed. But I know in another school, it will be difficult to, to have. That's what I believe. That's why I don't pursue something outside of school." Nancy also discussed the importance of collegiality and added that administrative support is crucial to this decision as well. It was evident that the participants felt a sense of community and belonging within these groups. Hence since collegiality encompasses this sense of community and belonging, it was the term chosen group these experiences.

Discussion of Findings

While the literature was limited when it came to reasons why Hispanic females enter and remain in the secondary STEM classroom, it did provide three potential motivating factors that led educators of underrepresented groups in the STEM classroom or STEM professions. One such factor connected cultural wealth to Latinx STEM teacher motivation and was presented by Monarrez et al. (2021). Monarrez et al., (2021) found that the participants own experiences with teachers, the potential to make a difference as an educator, and giving back to the community were prevalent in the rationale behind the participants of the study purpose for entering the

classroom. My study corroborates these findings. Here, the emergent themes, specifically giving back and exposure, are directly aligned with the findings in Monarrez et al. (2021) study. Participants noted that their experiences with past educators, as well as making a difference as a teacher were motivating factors for entering and remaining in the secondary STEM classroom.

Morettini (2017) found that there was a connection between race and motivation to become STEM educators for participants of different backgrounds. Morettini (2017) found that negative educational experiences related to race and the desire to provide positive educational experiences was prevalent for African American participants in the study. While the participants of my study did not discuss negative educational experiences due to their race, they did discuss the desire to provide positive educational experiences for their students. Participants elaborated on their desire to make an impact in the classroom through creating a supportive environment and exposing them to various fields related to their subject.

The third factor identified in the literature was a disillusionment with STEM professions (Collins et al., 2020). Collins et al. (2020) reflect on how impostor syndrome and gender biases experienced by the authors discouraged from continuing their practice in STEM professions and used their contextual complexities within the STEM pathway (Gallard-Martinez et al., 2019) as a source of inspiration to enter the STEM classroom. While the participants in my study did not enter any field prior to teaching, they were aware of the contextual complexities that exist within the STEM pathway, such as lack of females in various STEM professions. However, awareness of these contextual complexities, coupled with lack of exposure, were cited as reasons to not enter other STEM professions, rather than as a rationale for entering secondary STEM education.

The literature also discusses the importance of representation and role models in the classroom to promote STEM-career interest (Martin & Fisher-Ari, 2021; Sahir & Waxman,

2021; Sahir et al., 2017; Tey et al., 2020). While the scope of this study was to identify the experiences that led educators into the secondary STEM classroom, there were three participants who initially intended to go into fields such as medicine and engineering. Their path to selecting this initial career choice treaded along the lines of exposure to these career fields and the necessary support to continue down these career paths. The participants of this study, however, did understand that if they did not want their students to eliminate STEM careers from their list of possibilities, they would have to act as role models, and expose students to the possibilities, as well as provide the necessary support to encourage them to follow their chosen path. This notion was aligned to Colman's (2020) study, which found that students must have access and exposure to STEM careers that are available.

Gottfredson's (1996) Theory of Circumscription and Compromise allowed for a proper lens to view and make sense of the lived experiences of the participants in my study, as well as inform the research questions that would allow me to extract the lived experiences of the participants that led them to the secondary STEM classroom. In line with Gottfredson's (1996) Theory of Circumscription and Compromise, the participants had the tendency to describe early stages of career choice by discussing the careers they were exposed to the most, such as dentist and doctor, for example, and were whittled down to careers that were deemed acceptable for the participant.

Gottfredson (1996) theorized that once acceptable and accessible careers have been identified, individuals would enter the compromise phase of career choice, in which they eventually decide on a chosen career. Factors such as parents, friends, teachers, colleagues, and other individuals in the social network of the individual play a key role in that choice (Gottfredson, 1996). In this study, the data shows that parents and friends were primary

individuals within the social network of the participant that shaped the career choice of the participant once acceptable and accessible careers had been identified.

Lastly, Gottfredson (1996) theorized that career expectations were set by the groups to which they have had the most exposure, leading to disparities between gender, social class, race, and ethnicity. The participants of this study did elaborate the exposure to females, or lack thereof, in certain career paths the role it played on career choice. Some participants did not see themselves following certain career paths because they did not see someone like them in that career path.

Limitations of the Study

While every effort was made to recruit participants in accordance with the recruitment process submitted to and approved by the Institutional Review Board, there were only five participants who ultimately went through the study from beginning to end. While saturation was reached, the inclusion of more participants could have provided a clearer picture regarding the lived experiences that leads Hispanic females into secondary STEM education.

This limitation is coupled with the timeframe in which recruitment occurred. Recruitment began at the end of the school year. By the end of May 2022, twenty invitations had been sent out, however only eight participants had agreed to participate in the study and only five of the eight completed the informed consent form and scheduled the interviews. Majority of the potential participants who were contacted were about to or had already started their summer vacation. Since the mode of recruitment occurred via email, it is possible that these individuals never saw the invitation to participate since they were already out for summer vacation.

Another limitation was the range of teaching experience of the participants. It would have been helpful to see if those who had more teaching experience had different reasons to remain in

the classroom than those who had been in the classroom less than fifteen years. While participants with more than 15 years of experience had been invited to participate in the study, those who responded to the invitation to participate had less than 15 years in the classroom. Additionally, individuals from three different school districts were invited to participate, however, the individuals who responded to the invitation to participate were part of one school district within the region of interest.

Implications

This research sought to identify the lived experiences of Hispanic females that paved their career path to secondary STEM education. While most participants in this study did not regret their decision to enter the classroom, all participants expressed the idea that, had they received adequate and early enough exposure to careers that aligned to their interest in mathematics and science, it could have made a difference in the career that was chosen. The findings of this study can help inform programs within secondary education, as well as preservice and inservice programs to ensure that highly qualified, supportive Hispanic females enter the secondary STEM classroom. Moreover, the findings suggest opportunities that could be valuable for secondary students and parents so that they can make informed decisions regarding their postsecondary education.

The first implication regards exposure. Participants in this study identified exposure as one of the key factors limiting the scope of their career choice. This limited exposure to different career paths came from both family and school itself. While school and district administrators have a limited, potentially nonexistent, impact on the exposure parents provide to their child, they do have the opportunity to provide this exposure within the school settings. Hence, the results of this study emphasize the need for intentional, targeted opportunities for students,

specifically those that which are traditionally underrepresented in particular fields, within the school environment. School and district administrators, along with school counselors and educators, should work towards providing these opportunities early on to ensure that students have exposure and the time necessary to make an informed decision regarding career choice.

Parental involvement programs have the potential to deliver this exposure to the parents. As noted in the results of this study, the participants discussed their own exposure to career fields and how it was aligned to the exposure of their own parents. By broadening the scope of potential career pathways for parents, there is a potential for a discussion among parents and their child regarding what is available. Additionally, information regarding how to have these conversation, and the type of support their child might need when choosing STEM-related fields could be facilitated through parental involvement programs.

Moreover, while programs are currently in place to provide this exposure, there needs to be a component of this exposure that focuses on hand-on experiences for the students. The participants in this study, for example, noted that it was exposure to and experience with teaching that allowed them to identify secondary STEM education as a plausible career choice. More importantly, experience also allowed some of the participants to decide that a particular field was not for them, prior to entering an undergraduate program. Ana, for example, noted that her experience in high school as a dental hygienist convinced her that that field was not for her. Such an experience was as valuable as her tutoring experience in helping her decide the career path she wished to pursue. This aligns to the aforementioned implication for school and district administrations and opportunities they provide to students.

This study identified support as crucial to the participants as they chose and pursued a career path. Again, while parents and friends were seen as key sources of support, the

participants noted that they are using their experiences with support to give back to the students in their classroom. Hence, the classroom itself is seen as an opportunity for educators to create a culture of support and actively role model to promote STEM-related careers. Thus, in addition to providing meaningful, intentional exposure and experiences to students early on in an educational setting, school and district administrators should also work toward providing educators the opportunity to participate in activities that allow them to bring exposure to the classroom and emphasize the importance of such activities, particularly in STEM classrooms as well as create a support system within the classroom. Additionally, educators, both preservice and inservice, should be made aware of the potential impact of expanding their professional network to include professionals currently employed in STEM-related professions. This could facilitate the ability of educators to bring this awareness to the classroom.

Collegiality was also seen as a key component for the participants of the study. A resulting implication for school and district administrators is regarding the time afforded to educators for planning. While professional learning communities have grown in prominence over recent years, Riggins and Knowles (2020) point out that "many districts use the term PLC, but do not implement actions that members of a PLC actually complete" (p. 47), pointing towards time taken from educators for a meeting or other activity that limits an educator's opportunity to collaborate. Hence, school and district administration should be sensitive to the need of educators to collaborate among peers in an organic manner that allows for discussions about content, students, pedagogy, and other factors relevant to their classrooms that promotes professional growth among educators.

Recommendations for Future Research

This study identified factors that could potentially assist in the promotion of STEM careers among traditionally underrepresented groups and could benefit from future research. One such factor of ongoing support and active role modeling by an educator who represents the background of the underrepresented group of interest in the classroom. As noted by Riegle-Crumb et al. (2018), simply exposing students to counter-stereotypical evidence, such as an increased proportion of female teachers and peers in the classroom, does not create significant effect on the views held by female students, hence it would be worth investigating whether the supportive role that educators play, specifically in secondary STEM classroom does, in fact, promote participation in STEM-related careers among Hispanic female students within Region One.

Additionally, it would be worth studying the lived experiences of secondary STEM educators like those in this study at various locations within Region One. Participants from the Lower Valley (Brownsville area) and the Upper Valley (Laredo area) could, potential provide new insight regarding what allows Hispanic females to enter and remain in the secondary STEM classroom. Hispanic men could also be included in this study to see if there are difference between gender regarding their motivation to enter the classroom and how that can impact programs implemented at the secondary level to promote career paths, as well as preservice and inservice education opportunities geared towards preparing or exposing these educators to contextual factors that create gender disparities in various STEM careers.

Conclusion

The lived experiences of the participants of this study informed the research questions of interest regarding what leads Hispanic females into the secondary STEM, as well as what allows

them to remain in the secondary STEM classroom. The study yielded four prominent themes and five subthemes, all of which can be connected to the literature on the matter, as well as the theoretical framework used in this study. Additionally, these experiences and the resulting data analysis provided implications for school and district administrators, educators, and special programs that could lead to changes that are crucial to Hispanic females, and perhaps other groups currently underrepresented in STEM careers, as they make decisions to pursue regarding what to study as undergraduates and what career to pursue post-graduation. Limitations to the current study were also discussed and recommendations for future research were provided.

The desire to conduct this study arose from wanting to identify factors that promote female, Hispanic representation in the secondary STEM classroom to, in turn, encourage this female, Hispanic students in our region to pursue STEM careers. Through this phenomenological inquiry, I was able to gain insight regarding what led the participants to gain interest and remain in the secondary STEM classroom. While some of the experiences of the participants resonated with my own, such as the role that lack of exposure played in their career choice, others caught me by surprise. For example, I learned that not all exposure is created equally. It is not enough to simply tell students of potential career pathways. In order to generate an effect, students must have the opportunity to experience these career pathways so that they can make an informed decision regarding their career, as was the case for the participants in this study and their experiences with education that led them to choose this field. While this was not the case for me, the participants expressed that these were key events that led them to choose education as their career.

Moreover, this study informs my own practice in two ways. First, I have gained experience as a qualitative researcher. I have a better understanding of the process of designing

the study, gaining the appropriate permissions, carrying out the study, and conducting the data analysis. This experience was valuable and what I have learned along the way will be beneficial as I continue to conduct research. Second, as a practitioner, I see that it is important to provide my students with experiences within different career fields as I work to broaden their exposure to STEM pathways. While my voice, as an educator, may not be the most powerful one or influential one in the decision students ultimately make regarding career choice, I have learned that it does have an impact. Hence, I encourage practitioners who review this work to do so through the lens of an educator and think about the types of experiences they can bring into their own classrooms or to their campus that allows their students to acknowledge available STEM pathways and make them viable career paths.

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APPENDIX A

APPENDIX A

GUIDING INTERVIEW QUESTIONS

Guiding Interview Questions
Initial questions:
Name
Courses currently taught
Years teaching
Interview #1: Focus on the childhood (primary and secondary) experiences of the participants, as they pertain to education, family, culture and its role on the decision to become a STEM educator.

- What can you tell me about your family background?
- Describe the role that education played in your family.
- Did you have any memorable teachers? Why were they memorable?
- What type of messages about career choice do you recall hearing from family? Friends? Teachers?
- What type of careers were you familiar with? How did you become familiar with them?
    - Why do you think you were not familiar with them before?
- Do you recall some of your early career choices? How did you settle on your chosen career?

Interview #2: Focus on the post-secondary experiences of the participants, as they pertain to education, family, culture and its role on the decision to become a STEM educator.

- Where did you want to attend college and where did you actually attend college. What influenced the decision to attend this particular school?
- What was your college major? Minor?
- What do you feel led you to major in ____?
- What did you see yourself doing after college?
- Consider what we have and have not discussed:
    - **(If applicable)** What type of experiences led you to education instead of what you initially intended to do?
    - What types of experiences led you to become a secondary teacher?
- When you decided to become a teacher, what was your certification process like?
- **(If applicable)** What was your student teaching experience like?

Potential follow-up questions:

- Can you tell more about…?
- Can you elaborate on…
- Is there anything else you'd like to share?

Interview #3: Focus of the on the how the child-hood experiences and post-secondary experiences of the participants led to the decision to become a STEM educator.

- How have previously discussed experiences shaped your trajectory into the classroom?
- Do you feel that you were prepared to enter the classroom?
    - What could have helped you feel more prepared?
- What significance, if any, do you find in your position as a _____ educator?
- Now that you're in the classroom, is it a place you'd like to stay?
    - What type of experiences/factors do you think will help you stay in the classroom?
    - Do you still have the opportunity to learn?
- What type of factors do you think would have lead you to consider alternative careers?
- Given your experiences and your insight now, would you choose this career again?
- What do the following words mean to you?
    - Support
    - Exposure
    - Self-Sufficient
- When did you become aware of the term STEM?
    - How was it introduced?
- What does STEM mean to you?

Member Checking:

Does the following resonate with you?

- Your family was supportive of whatever you would have chosen as a career, as long as, in the end, you were able to provide for yourself and not have to depend on anyone else to survive.

OR

- Had your family been supportive, you could have done what you initially intended to do.

- Perhaps one of the reasons you did not consider alternative fields is because you did not have an early enough exposure to those career fields.

- You were not limited in what you could do or turned off by different careers due to your gender, but due to lack of exposure.

- Majority of the messages regarding education and its importance came from your maternal side.

- Prior to becoming a teacher, you either had a positive, informal teaching experience or admired an individual that inspired you to be that person for others.

- A collaborative or supportive environment among colleagues, not necessarily with administration, encourages you to remain in the classroom.

APPENDIX B

APPENDIX B

LIST OF THEMES AND SUBTHEMES

Main Themes	Subthemes		Total
A message of independence			80
	Self-Sufficient	13	
	Support	67	
You don't know what you don't know'			151
	Exposure	115	
	Gender	31	
Reasons to Stay			28
	Collegiality	9	
	Giving Back	19	

APPENDIX C

APPENDIX C

MEMBER CHECKING MATRIX

	Q1: Your family was supportive of whatever you would have chosen as a career, as long as, in the end, you were able to provide for yourself and not have to depend on anyone else to survive	Q2: Perhaps one of the reasons you did not consider alternative fields is because you did not have an early enough exposure to those career fields	Q3: You were not limited in what you could do or turned off by different careers due to your gender, but due to lack of exposure	Q4: Majority of the messages regarding education and its importance came from your maternal side	Q5: Prior to becoming a teacher, you either had a positive, informal teaching experience or admired an individual that inspired you to be that person for others	Q6: A collaborative or supportive environment among colleagues, not necessarily with administration, encourages you to remain in the classroom
Ana	Y	Y	Y	No: Mix of both parents, did not hear one more than the other.	Y: Informal teaching	Y
Erica	N	Y	Y	Y	Y: Teacher	Y
Nancy	Y	Y	Y	No: Mix of both parents, did not hear one more than the other.	Y: Informal teaching & Teacher	Y: Emphasized both are ultimately necessary.
Marina	Y	Y	Y	Y	Y: Informal teaching	Y
Dalila	Y	Y	Y	Y	Y: Family as teachers; Teachers	Y

APPENDIX D

APPENDIX D

IRB APPROVAL EMAIL

tick@lab - IRB Protocol IRB-22-0152 - Exploring the path to becoming a female, Hispanic STEM educator: A phenomenological inquiry has been approved

tickatlab@utrgv.edu <tickatlab@utrgv.edu>
Sat 5/21/2022 5:22 AM

To: Cristina Saldana <cristina.saldana02@utrgv.edu>;Karin Lewis <karin.lewis@utrgv.edu>

Dear tick@lab user,

The IRB protocol with ref. no. IRB-22-0152 has been approved.

Any changes/amendments to your IRB Protocol must be submitted as a revision and approved by the IRB committee prior to initiation in research activities. A copy of your official approval letter is attached to your protocol study file.

Status change comment:
This project has been determined to be Exempt from federal regulations. With this determination your project can begin. To access your letter right-click on the paperclip icon at the file level (next to the file folder icon) and select Edit Attachment from the menu. Simply clicking on the document will download a copy for your records.

Please click here to open the document.

This message has been automatically generated by the tick@lab system. Please DO NOT REPLY to this message as this mailbox is unmonitored.

For questions, please contact the IRB Coordinator or your system administrator.

To access the tick@lab system, please visit https://LAR.utrgv.edu/tickatlab/Default.aspx?module=IRB&action=List.

APPENDIX E

APPENDIX E

INVITATION TO PARTICIPATE

Dear Teacher,

You are invited to participate in a research study titled "Exploring the Path to Becoming a Female, Hispanic STEM Educator: A Phenomenological Inquiry."
I want to assure you that this research is voluntary, and the information that you provide is confidential and will be protected by the researcher. Participation in this research is completely voluntary, you may choose not to participate without penalty.

The purpose of this study is to investigate the positive experiences that have encouraged Hispanic females into the secondary STEM classroom, as well as the experiences and opportunities that have allowed them to remain in the secondary STEM classroom. From this research, I am hoping to contribute to the field of knowledge that guides preservice and inservice teacher education.

If you decide to participate in this study, you will be asked to participate in three interviews, all scheduled at your convenience. During the first scheduled interview, the informed consent form will be reviewed with you, and if signed, we will proceed with the first interview and the scheduling of subsequent interviews. Interviews will happen via Zoom or in-person, whichever you prefer. All interviews will be audio and video recorded and later transcribed. Each interview is expected to last approximately 30-45 minutes, for a total time of 1.5 to 2 hours.

Again, you participate in this research is completely voluntary. You are free to withdraw from the study at any time. The information you provide will be private, confidential, and protected by me.
If you would like to participate in this research study, please reply to this email acknowledging your agreement to participate. You should receive a reply in two days with suggested meeting times. During that meeting, your willingness to participate in the study will once again be addressed, and an informed consent form will be signed, if you decide to participate in the study.

Please note that this research has been reviewed and approved by the University of Texas-Rio Grande Valley Institutional Review Board for Human Subjects Protection (IRB). If you have questions related to the research, please contact me by telephone at (956)322-6334 or by email at cristina.saldana02@utrgv.edu
Thank you for your cooperation!

Kind Regards,
Cristina Saldaña
UTRGV Doctoral Candidate/Principal Investigator

APPENDIX F

APPENDIX F

INFORMED CONSENT FORM

The University of Texas Rio Grande Valley

INFORMED CONSENT FORM

Study Title: Exploring the path to becoming a female, Hispanic STEM educator: A phenomenological inquiry

Consent Name:

Principal Investigator:	Cristina Saldaña	Telephone: (956)322-6334
Emergency Contact:	Karin Lewis	Telephone: (956)882-5704

Key points you should know

- We are inviting you to be in a research study we are conducting. Your participation is voluntary. This means it is up to you and only you to decide if you want to be in the study. Even if you decide to join the study, you are free to leave at any time if you change your mind.
- Take your time and ask to have any words or information that you do not understand explained to you.
- We are doing this study because we want to learn about the positive experiences that have encouraged Hispanic females into the secondary STEM classroom, as well as the experiences and opportunities that have allowed them to remain in the secondary STEM classroom.
- Why are you being asked to be in this study?
    - You were identified as an individual who is
        - Female
        - Hispanic
        - A secondary STEM educator
- What will you do if you agree to be in the study?
    - Participation in this study requires videotaping/audiotape of three interviews. By signing this consent form you are giving us permission to make and use these recordings.

- Can you be harmed by being in this study?
    - Risks to your personal privacy and confidentiality: Your participation in this research will be held strictly confidential and only a pseudonym will be used to identify your stored data. However, because there will be a link between the code and your identity, confidentiality cannot be guaranteed.
- What are the costs of being in the study?
    - There are no additional costs to you by taking part in this study.
- Will you get anything for being in this study?
    - You will not receive any payments for taking part in this study.

Can the information we collect be used for other studies?

Information that could identify you will be removed and the information you gave us may be used for future research by us or other researchers; we will not contact you to sign another consent form if we decide to do this.
We will not use or distribute information you gave us for any other research by us or other researchers in the future.

What happens if I say no or change my mind?

- You can say you do not want to be in the study now or if you change your mind later, you can stop participating at any time.
- No one will treat your differently. You will not be penalized.

How will my privacy be protected?

- Your information will be stored with a pseudonym instead of identifiers (such as name, date of birth, email address, etc.).
- Even though we will make efforts to keep your information private, we cannot guarantee confidently.
- No published scientific reports will identify you directly.

Who to contact for research related questions

For questions about this study or to report any problems you experience as a result of being in this study contact Cristina Saldaña at (956)322-6334 or cristina.saldana02@utrgv.edu. You can also contact Dr. Karin Lewis at (956)882-5704 Or karin.lewis@utrgv.edu.

Who to contact regarding your rights as a participant

This research has been reviewed and approved by the University of Texas Rio Grande Valley Institutional Review Board for Human Subjects Protections (IRB). If you have any questions about your rights as a participant, or if you feel that your rights as a participant were not adequately met by the researcher, please contact the IRB at (956) 665-3598 or irb@utrgv.edu.

Signatures

By signing below, you indicate that you are voluntarily agreeing to participate in this study and that the procedures involved have been described to your satisfaction. The researcher will provide you with a copy of this form for your own reference. To participate, you must be at least 18 years of age. If you are under 18, please inform the researcher.

_____ ____/____/_____

Participant's Signature Date

BIOGRAPHICAL SKETCH

Cristina Saldaña attended the former University of Texas – Pan American (UTPA) in Edinburg, Texas where she received her bachelor's degree (BS) in Mathematics with the concentration in secondary education in December 2013. Immediately after graduation, she continued with her education at University of Texas – Rio Grande Valley (UTRGV) and received her master's degree (M.Ed) in Educational Administration in December 2015 and master's degree (MS) in Industrial and Applied Mathematics in May 2018. In December 2022, Cristina recieved her Doctor of Education in Curriculum and Instruction, with a specialization in Mathematics Education. During this time, Cristina has worked as a high school teacher and dual enrollment instructor with South Texas College (STC), where she has taught Algebra 1, Dual Enrollment (DE) College Algebra, DE Precalculus, DE Statistics, DE Calculus 1, AP Calculus AB, AP Calculus BC, and AP Statistics. Cristina has served as department chair since 2017 and also currently serves as UIL Academic coordinator and Mathematics and Calculator Applications coach, Senior Class sponsor, and National Honor Society sponsor. Cristina Saldaña's personal email is csaldana625@gmail.com.