

## ABSTRACT

LYNCH, TERRY BRASWELL. *Battle Tested: The Stories of African American Male Alumni at a State Residential Math and Science School: A Narrative Inquiry*. (Under the direction of Dr. Joy Gaston Gayles).

Residential math and science high schools have been in existence since 1980 (Stephens, 1999). These schools accept high-achieving students and immerse them in a demanding STEM-focused high school environment (Roberts & Alderice, 2015). Research on the experiences of African American students at residential math and science schools is scarce. This qualitative study shares the background, academic, and social experiences of African American males who transitioned into and graduated from Pioneer Academy, a state residential math and science school.

This study used narrative analysis to construct the data, which were collected through an online demographic survey, individual interview, and an online reflection journal with 12 participants. Two theoretical perspectives guided this study: anti-deficit achievement theory and transition theory. Four major themes emerged from the review of the data: (a) family influence, (b) seeking greater academic opportunities, (c) adjustment to a residential math and science school, and (d) achieving success at a residential math and science school. Findings from this study shed light on the motivation and support to attend a residential math and science school, the factors that contributed to a successful transition to and through a residential math and science school, and the importance of a college preparatory experience.

African American males have a long and rich history of valuable contributions to science, engineering, technology, and mathematics (STEM) fields that have changed this country and the world. Yet, their accomplishments are seen as atypical for African American men. Although there is great value in sharing the stories of African American men who have found success in

STEM fields, examples of success of African American men are often overlooked. The themes and findings from this study contribute to the literature concerning African American male transition, African American male success in STEM, and the experiences of African American male students at a residential math and science school. The study concludes with a discussion of the findings in the context of existing literature, theoretical implications, limitations, and recommendations for practice and future research.

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Battle Tested: The Stories of African American Male Alumni at a State Residential Math and  
Science School: A Narrative Inquiry

by  
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## **BIOGRAPHY**

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## **DEDICATION**

I dedicate this dissertation to my wife, my parents, my children, and my extended family. There were many days when I felt like stopping. Thank you for your love and support.

I also dedicate this dissertation to the 12 men who were willing to share their story with me: Victor, Eugene, Sean, Michael, Thomas, Jackson, Taylor, Keith, Larry, Eric, Aaron, and Darren.

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*“A man’s heart plans his way: but the LORD directs his steps.”*

*Proverbs 16:9*

First, I would like to thank and acknowledge my God. Thank you for your grace, mercy, and love. Thank you for the roof over my head, the food on my table, the clothes on my body, and the shoes on my feet. Thank you for ordering my steps in this process.

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## TABLE OF CONTENTS

LIST OF TABLES .....	ix
CHAPTER ONE: INTRODUCTION .....	1
Significance of the Study .....	4
The Purpose of the Study and Overview of the Methodological Approach .....	9
Definition of Terms .....	10
Organization of Dissertation .....	12
CHAPTER TWO: LITERATURE REVIEW .....	13
Theoretical Frameworks .....	13
Harper’s Anti-Deficit Achievement Framework .....	13
Schlossberg’s Transition Theory .....	17
African American Students .....	20
The STEM Gap .....	20
Supportive Higher Education Environments .....	23
Supportive Factors for Gifted African American Male Learners .....	26
Residential Learning Communities .....	31
History and Overview .....	31
STEM-Focused College Communities .....	35
State Residential Math and Science High Schools .....	36
African American Male Students at Residential Math and Science High Schools .....	39
CHAPTER THREE: METHODOLOGY .....	43
Research Design .....	44
Site Selection .....	46
Participant Selection .....	50
Data Collection .....	51
Data Analysis .....	53
Trustworthiness .....	56
Subjectivity Statement .....	56
CHAPTER FOUR: PARTICIPANT PROFILES .....	62
Participant Demographics .....	62
Table 4.1: Participant Family Information .....	64
Table 4.2: Participant Education Information .....	65
Participant Narratives .....	66
Victor’s Story .....	66
Eugene’s Story .....	70
Sean’s Story .....	73
Michael’s Story .....	75
Thomas’s Story .....	79
Jackson’s Story .....	81
Taylor’s Story .....	84
Keith’s Story .....	88
Larry’s Story .....	90
Eric’s Story .....	93
Aaron’s Story .....	96

Darren’s Story .....	98
CHAPTER FIVE: FINDINGS.....	101
Table 5.1: Themes and Subthemes .....	102
Family Influence: “They didn’t accept mediocre when it came to education.”.....	102
Positive Support and Encouragement: .....	103
Family Role Models:.....	106
Seeking Greater Academic Opportunities: “I had aspirations and dreams of doing big things.” .....	110
Interest in and Exposure to STEM:.....	110
Limited Opportunities at Home High School: .....	113
Adjusting to a Residential Math and Science High School: “It was an eye-opening experience.” .....	117
Adjustment to Increased Academic Rigor: .....	117
Adjustment to a Predominantly White Institution (PWI): .....	125
Achieving Success at a Residential Math and Science High School: “It was the biggest growth spurt of my life.” .....	131
Support from High-Quality Faculty and Staff: .....	132
Supportive African American Peer Community:.....	140
Meaningful Leadership and Participation in Cocurricular Activities: .....	144
Gaining Academic and Social Confidence: .....	148
Summary .....	156
CHAPTER SIX: DISCUSSION .....	157
Motivation and Support to Attend a Residential Math and Science School.....	158
Factors that Contribute to the Success of High-Achieving African American Male Students.....	161
Importance of College Preparatory Experience .....	163
Theoretical Frameworks .....	166
Harper’s Anti-Deficit Achievement Framework .....	166
Schlossberg’s Transition Theory .....	169
Practice and Policy Recommendations for Residential Math and Science School Faculty, Staff, and Administrators.....	173
Communication with Family .....	173
Quality Curriculum .....	174
Cocurricular Experiences.....	175
Campus Climate.....	175
Outreach.....	176
Anti-Deficit Approach .....	179
Recommendations for Future Research .....	180
Limitations of the Study.....	182
Conclusion .....	183
REFERENCES .....	185
APPENDICES .....	196
APPENDIX A: CODEBOOK EXCERPT .....	197
APPENDIX B: SAMPLE LETTER .....	198

APPENDIX C: ONLINE DEMOGRAPHIC SURVEY.....	200
APPENDIX D: ONLINE REFLECTION JOURNAL .....	202
APPENDIX E: INTERVIEW PROTOCOL.....	204
APPENDIX F: CONSENT FORM.....	206

**LIST OF TABLES**

Table 4.1: Participant Family Information.....	64
Table 4.2: Participant Education Information.....	65
Table 5.1: Themes and Subthemes .....	102

## CHAPTER ONE: INTRODUCTION

State-supported residential math and science schools attract intellectually gifted and talented students and prepare them for careers in science, technology, engineering, and mathematics (STEM) (Jones, 2009). State-supported residential math and science schools are members of a larger consortium of schools. The National Consortium of Secondary STEM Schools (NCSSSS) was established in 1988 to provide a forum for specialized STEM secondary schools. The consortium now includes 100 member schools, many ranked as top schools in the country (National Consortium for Secondary STEM Schools, 2019). The consortium also includes 55 affiliate members (colleges, universities, summer programs, foundations, and corporations) located in 32 states, which share the goals of transforming mathematics, science, and technology education (National Consortium for Secondary STEM Schools, 2019). Eighty-one percent of Consortium schools offer AP level courses, and 93% of Consortium schools had alumni who enrolled in an Ivy League school for college.

State-supported residential math and science schools make up a small percentage of consortium schools and have been in existence since 1980 (Jones, 2009). Between 1980 and 2000, a dozen states created residential math and science schools to serve talented math and science students in their state (Stephens, 1999). These specialized schools accept high school students and immerse them in a demanding, STEM-focused, college-level residential environment. State residential math and science schools provide unique challenges and opportunities to participating students with the goal of preparing emerging leaders in the state as they pursue STEM careers (Roberts & Alderice, 2015).

Early research on these schools provided information about the profiles of the schools (Eilber, 1987; Stanley, 1987; Stephens, 1999; Sethna, Wickstrom, Boothe, & Stanley, 2001;

Cross, Margison, & Williams, 2003). Boothe, Sethna, Stanley, and Colgate (1999) compared three of the state residential math and science schools with five other nonmath and nonscience schools. Cross and Miller (2007) reviewed the existing 15 state residential math and science schools and compared them with five specialized performing arts schools.

Despite a track record of high graduation rates from high school and STEM degree completion at the college level, there is a lack of information about the experiences of students and graduates of state residential math and science schools. Each year, thousands of high school sophomores, juniors, and seniors leave the comfort of their homes and families to attend a state residential math and science school. They leave their home high school and enter a new academic environment. Research on these students has been scarce; specifically, we know very little about the background, academic, and social experiences of African American male students who attended state residential math and science schools.

As the demand for qualified STEM personnel continues to grow, STEM bachelor's degree attainments become more imperative. Across the country, access to STEM learning is impacted by geography, race, gender, and socio-economic status. Historically, STEM has been dominated by White males (Grays, 2013). During his presidency, former President Barack Obama recognized the value of STEM education by prioritizing it for his administration. At that time, in order for the country to meet evolving workforce needs, his administration stated that America would need to add one million more STEM professionals by 2022 (U.S. Department of Education, 2016). President Obama stated that in order to meet this need, the country should continue to support and encourage degree completion, especially for African Americans and others who are underrepresented in these fields (Handelsman & Smith, 2016).

Efforts have been made to increase the diversity of participants in STEM experiences and STEM occupations. As it relates to African American men, most of the narrative has concentrated on a discourse of underachievement and failure rather than excellence (Clear, 1994; Fashola, 2003). African American males are underrepresented in postsecondary education and this problem is exacerbated in the area of STEM education (Coleman, 2014; Fashola, 2003).

The plight of African American males in STEM is discussed in multiple settings, including scholarly literature and the media. Often, the focus of the conversation is on the barriers or obstacles that African American men face when pursuing and obtaining a STEM degree. Harper (2012) argued that most empirical studies amplify minority student failure and deficits instead of highlighting their achievement. As a result, we know less about the factors that contribute to success than the factors that have impeded achievement, yielding few results to improve the situation. Harper stated that a more effective way to improve the status of African American male students is to speak with, recount, and tell the stories of those men who have found academic success.

Over the past decade, the amount of research on African American undergraduate men has expanded significantly (Harper & Newman, 2016). Studies have explored a range of environments, including community colleges, historically Black colleges and universities (HBCUs), predominantly White institutions (PWIs), Hispanic-serving institutions (HSIs), and religiously affiliated colleges, to name a few (Harper & Newman, 2016). In addition, researchers have studied African American undergraduate males' access to college, encounters with racism, identity development, classroom and out-of-class engagement, student athlete participation, and college completion rate (Harper & Newman, 2016).

Despite the attention dedicated to African American men across a variety of institutions, few studies have focused on African American male students in a college preparatory residential high school environment. Lichten (2007) suggested that the focus for 99% of high school students, regardless of race, should be on preparation for college. Learning more about the experiences of African American male students who attended a residential math and science school can be an important step for individuals who are seeking to improve the K-12 STEM pipeline. In particular, focusing on high-achieving African American male students who found success in STEM can provide valuable insight to consortium schools, residential state schools, colleges, and universities, and the larger K-12 pipeline to examine the factors that played a role in their success. The information gained can assist schools with recruitment and retention for African American male students at residential math and science schools and at colleges.

### **Significance of the Study**

African American STEM degree attainment has remained relatively stagnant around 7.5% for the past decade (U.S. Department of Education, 2016). African American students continue to have the lowest STEM degree attainment of any other racial group (U.S. Department of Education, 2016). Although many African American students begin their undergraduate careers as STEM majors, they have the greatest likelihood of leaving the STEM major with a 34.7% retention rate and an overall attrition rate of 16.8% (Chen, 2013).

The U.S. Bureau of Labor Statistics has projected that 2.3 million scientists and engineers will be needed by 2020 in order to meet the demands of the growing STEM industry. Over the next decade, an estimated 80% of jobs will require STEM skills of some kind (Burroughs Wellcome Fund, 2016). In one state in the Southeast, there will be over 400,000 STEM-related jobs with an estimated additional 70,000 more jobs to appear by 2020. At the national level,

STEM education is the underpinning of our health, our economy, and our democracy (Burroughs Wellcome Fund, 2016).

As the need for STEM degree attainment becomes more of a national focus, there has been an increase in the number of studies on students of color and underrepresented minorities in STEM (Strayhorn, 2012; Palmer, Maramba, & Gasman, 2012). Studies have looked at the experiences of African American students studying STEM majors (McGee, 2013) and the experiences of graduate students pursuing doctoral degrees in STEM fields (Bush, 2014). Although studies have described how HBCUs can positively impact the STEM degree attainment of African American students, much of the recent literature overlooks African American students' precollege preparation and transition into college environments.

This study provides new literature on the experiences of African American male graduates at a state-supported residential math and science school. The unique combination of a rigorous schedule and a campus environment away from home provides a rare high school experience, especially for African American male students. The environment at a state residential math and science school is similar to the environment of a highly selective predominantly White college or institution (PWI). There are few studies that have looked at the African American male students who attended a residential math and science school (Coleman, 2014; Eatmon, 2007). Learning more about their experience and their transition at such a school is helpful for K-12 and higher education administrators, faculty, and staff.

This study highlights African American male achievement in STEM education and offers best practices and solutions to emulate, rather than adding to the literature on the lack of African American male participation. There is a need for scholarship that counters the negative characterization of African American males (Bush, 2014; Coleman, 2014; Harper, 2010). This

study also recognizes important strategies utilized by African American men transitioning into a challenging, unique, and rigorous residential STEM high school environment. As a result of this study, several themes emerged that played a major role in the transition to and through that residential STEM environment, and to their ultimate transition to college. Further inquiry into the impact of these environments may lead to the development of additional support systems necessary for student success in these environments. This research can inform both high school and college residential learning environments.

This study is beneficial to state residential STEM schools and National Consortium of Secondary STEM Schools (NCSSSS). These schools could benefit from additional research that highlights the experiences of students, factors that contributed to their transition, and the impact of their transition on their college experience. Research can help inform and expand best practices across multiple residential STEM-focused high schools, potentially benefiting thousands of students and prospective students while expanding the STEM pipeline. In addition, this study provides valuable information with greater application within residential STEM-focused high schools.

This study benefits administrators, faculty, staff, and community members connected to Pioneer Academy and other state residential math and science schools. At these schools, parents entrust their children to the school during key developmental years for academic and social growth. At Pioneer Academy, students enroll and live away from home for the final two years of their high school career. During that time, students make decisions about college and career goals away from their home environment. Students' experience at Pioneer Academy can have a profound effect on their awareness of and thoughts about career paths at a place where all students have already demonstrated interest in and aptitude for STEM. The research from this

study may encourage schools to be more intentional in the support they provide for African American students transitioning to and through the school. Findings from this study may also influence practices and policies at Pioneer Academy, other state residential math and science schools, and STEM-focused living-learning communities to assist in the successful recruitment, transition, retention, and matriculation of African American male students.

Results from this study contribute to the literature, practice, and policy. This study not only adds to the body of literature regarding the experience of African American students in a STEM environment but also provides insight into the world of STEM at a residential science and math school from the viewpoint of African American students. Results help to identify factors of success of African American students at residential math and science schools. Results also help to identify factors that assisted African American male students to and through their experience at a residential high school. By gaining an understanding of the resources these students found most helpful, student affairs practitioners and policymakers will be able to develop services and activities that address the needs of this student population. The results can also inform the leveraging of existing resources to improve academic success and student development. Finally, the results from this study can have a positive impact on younger African American men with an interest in a STEM field through increased exposure to positive success stories of African American men who attended a residential math and science school and graduated from college with a STEM degree.

Despite statistics that suggest otherwise, there are African American male students who have achieved success at the high school and college levels. Though there are examples, success stories are often overlooked or not shared. Even with a track record of high graduation rates from the high school and STEM degree completion at the college level, there is a lack of

information about the experiences of African American students, and specifically, African American male alumni from a state residential math and science school like Pioneer Academy. Further research is needed to examine the experiences of African American male students. Focusing on the factors that contribute to the success of African American males that graduated from a state residential math and science school would provide valuable insight to high schools, colleges, and graduate schools.

Learning more about the specific experiences of Pioneer Academy's African American male alumni may provide useful information regarding the impact of their attendance at a residential math and science school on their pursuit of a STEM career. Along with scarcity of research on African American males, just as lacking is research on the impact of the residential component of Pioneer Academy and other state residential math and science schools. Increasing knowledge and awareness of those students who have been successful in a residential environment would highlight specific factors or initiatives that schools could mimic to encourage these positive influences in the future. The information gained may assist with recruitment efforts, which could ultimately increase the number of African American students who enroll in a state residential math and science school. The information gained could also assist with retention efforts to strengthen the student experience and increase the number of students who attend and graduate from a state residential math and science school and continue the pursuit of a STEM career, ultimately diversifying the STEM industries.

Using a qualitative approach, this study explores the experiences of African American males who graduated from Pioneer Academy, a state-supported residential math and science school, and examines how their experience at the high school influenced their decision to pursue a STEM career. Specifically, the study uses narrative inquiry to gain insight into how African

American males reflected on their experiences in a residential high school, and to identify experiences that impacted their decision to pursue a STEM career.

### **The Purpose of the Study and Overview of the Methodological Approach**

The purpose of this study was to explore the experiences of African American male alumni who graduated from Pioneer Academy, a residential state math and science school. Qualitative research was used to understand and explain the meaning of lived experiences. Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem (Creswell, 2007). Narrative inquiry is the interdisciplinary study of activities involved in generating and analyzing stories of life experiences and reporting that kind of research. One of the goals of narrative inquiry is to give voice to those whose stories have not previously been heard in educational research (Creswell, 2007).

A qualitative research design served as an ideal method to address the research question appropriate for this study, as the focus was on the participants' rich descriptions, reflections, and stories of their lived experiences as graduates of Pioneer Academy. Specifically, narrative inquiry was used to explore and understand stories of African American male students' transition through Pioneer Academy among 12 alumni. This study used participants' narratives as a way to categorize thematic insights into their experiences at Pioneer Academy. Themes were identified as meaningful or impactful from their time period at Pioneer Academy as they reflected on their experiences. This study was designed to allow the themes generated by the participants' narratives to give power to the participants' voices as a minority population in STEM. Narrative inquiry methodology guided the data collection and analysis from individual interviews with alumni. Chapter 3 provides further explanation of this methodology.

## Definition of Terms

The following terms are referred to throughout the study.

*African American*: In this study, African American is a descriptor used to identify individuals of African descent living in the United States.

*HBCU (Historically Black College and University)*: Term used for a college or university that historically served a majority Black/African American population.

*Male*: In this study, males are defined as individuals who were assigned the sex “male” at birth.

*NCSSSS (National Consortium of Secondary STEM Schools)*: A nonprofit organization that has a consortium of high schools focused on STEM education. The mission of NCSSSS, the nation’s alliance of secondary schools and programs preparing students for success and leadership in science, technology, engineering, and mathematics, is to serve their members’ students and professionals, to foster collaborations, to inform STEM policy, and to advocate for transformation in education (NCSSSS, 2019).

*Pioneer (Pioneer Academy)*: Pseudonym given to the school in this study.

*PWI (Predominantly White Institution)*: A descriptor used to identify higher education institutions in which Whites account for 50% or greater of the student enrollment (Brown & Dancy, 2010). The term is most commonly associated with higher education institutions. In this study, the term is also used as a descriptor for state residential math and science schools where Whites account for 50% or greater of the student enrollment at all schools.

*RLC (Residential Learning Communities/Living Learning Communities)*: Learning communities are structured curriculum programs with a common theme for a group of students to matriculate through beyond their degree program (Shapiro & Levine, 1999). They are often

associated with communities on a college or university. Shapiro and Levine (1999) identified four major types of learning communities: (a) paired or clustered courses, (b) cohorts in large courses or first-year interest groups, (c) team-taught courses, and (d) residential learning communities.

Residential learning communities provide an opportunity for significant interaction between peers, faculty, students, and staff (Astin, 1985; Freeman, Alston, & Winborne, 2008; Gabelnick, MacGregor, Matthews, & Smith, 2004; Shapiro & Levine, 1999). Successful living-learning communities have been shown to further educational and personal development and to positively impact assessment factors such as grade point average, retention, and student satisfaction (Association of College and University Housing Officers-International, 2016). Pioneer Academy and other state residential math and science school schools are not defined, or assessed, as living-learning communities. Given the purpose and academic focus of the school, and the residential requirement of the school, it can be argued that Pioneer Academy and other state residential math and science schools are living-learning communities at the high school level.

*STEM (Science, Technology, Engineering, and Mathematics):* Acronym used throughout the study. This study uses the 2014 National Science Foundation (NSF) list of STEM fields to determine majors and disciplines categorized as such.

*Trimester:* A trimester divides the academic year into three sessions (e.g., fall, winter, and spring). Each trimester is approximately 12–14 weeks long. At Pioneer Academy, a trimester schedule was used instead of a semester schedule.

*URM (Underrepresented Minority):* African Americans, American Indians or Alaska Natives, and Latinos, who have historically comprised a minority of the U.S. population.

Currently, URMs constitute 30% of the U.S. population, but by 2050, these groups will account for greater than 40% of the U.S. population. URMs are particularly underrepresented in the STEM fields (National Action Council for Minorities in Engineering, 2016).

### **Organization of Dissertation**

This dissertation consists of six chapters. Chapter 1 provides an overview of the research problem and explains the study's purpose, research question, significance, and key terms.

Chapter 2 reviews the theoretical frameworks that guided this study and provides a review of the literature on African American men in STEM. In addition, Chapter 2 provides a review of residential living-learning communities, specifically of the literature on residential math and science schools, and of the literature on the experiences of African American men in residential math and science schools. Chapter 3 outlines the study's methodology, including the research design, site and participant selection, data collection, and analysis procedures. Chapter 3 also shares how ethical concerns were mitigated and provides a subjectivity statement.

Chapter 4 presents the participants' narratives, whereas Chapter 5 reports on the themes that emerged from the study through an analysis of the narratives. Finally, Chapter 6 discusses the study's findings in relation to prior research and the study's theoretical frameworks, as well as implications for practice and future research.

## CHAPTER TWO: LITERATURE REVIEW

This chapter outlines the existing scholarly research about the experiences of African American males in several academic contexts. This study focused on the positive elements of the transition process for participants who achieved success in a rigorous STEM environment at a residential math and science school. It should be noted that some of the research reviewed attended to the problems of African American males as they navigated the STEM pipeline. This study was guided by the following research question: What are the storied background, academic, and social experiences of African American males who transitioned into and graduated from Pioneer Academy?

I begin this chapter by reviewing the two theoretical frameworks that guided this study: Harper's anti-deficit achievement framework and Schlossberg's transition theory. Next, I review literature on African Americans in STEM. The final section of this chapter reviews literature on residential living-learning communities, including a review of the literature on state residential math and science high schools.

### **Theoretical Frameworks**

Two theoretical frameworks were utilized for this study: Harper's anti-deficit achievement framework and Schlossberg's transition theory. A review of both frameworks is provided in this section.

#### ***Harper's Anti-Deficit Achievement Framework***

The first framework used to guide this study is Harper's (2010) anti-deficit achievement framework. The anti-deficit achievement framework inverts questions commonly asked about educational disadvantage, underrepresentation, insufficient preparation, academic underperformance, disengagement, and Black male student attrition (Harper, 2012). Harper

sought successful coping strategies utilized by African American male college students that help them navigate and achieve success in their college environments. Harper emphasized that to increase African American male educational attainment, the popular one-sided story on low-performing and failing African American males must be counterbalanced with insights gathered from those who successfully matriculated through higher education (Harper, 2012).

Harper applied the anti-deficit framework while interviewing 219 African American male students who attended 42 colleges and universities located in 20 states. All of the students who participated in the study earned a cumulative grade point average above 3.0. Data collection occurred one campus at a time as Harper conducted individual interviews with each student (Harper, 2012). Harper found commonalities between the African American men who participated in the study: they were actively involved in leadership positions on campus and had developed significant relationships with campus administrators and faculty. In addition, Harper found that student participants engaged in significant educational experiences outside of the classroom, including study abroad programs, internships, summer research, and service learning programs. Harper also found that, in recognition of their achievements, study participants earned numerous merit-based scholarships and honors.

Harper identified support systems and interventions that enhanced the students' educational experiences and enabled them to succeed. Harper found that despite the obstacles stacked against African American males, such as low teacher expectations, culturally unresponsive campus environments, preparation for academic work, and underrepresentation, there were still individuals that were able to persevere to successfully complete college (Harper, 2012). Harper also identified four significant milestones for African American males: (a) getting to college, (b) choosing a college, (c) paying for college, and (d) transitioning to college.

Harper stated that the most disappointing finding from his study was that nearly every student he interviewed said that Harper's interview marked the first time someone had asked them about how they had successfully navigated through college (Harper, 2012). Harper's study provides a foundation for the exploration of African American male success from an anti-deficit achievement perspective. Harper maintained that the most powerful recommendation he had for anyone who endeavors to improve the status of African American male students is to ask those who have been successful to reflect upon and talk about what helped them succeed. His study provided the opportunity for participants to share their story and to consider how they were able to overcome statistical odds. Participants in Harper's study shared that they considered themselves fortunate to have factors like parental expectations, teachers that cared about them, peer mentors, and access to college prep programs to assist them throughout their journey.

Rather than promoting the deficit-oriented status quo, this framework challenges researchers to reframe their research questions into anti-deficit queries at three distinct junctures: (a) precollege socialization and readiness, (b) college achievement, and (c) postcollegiate success in STEM. Each juncture represents achievement at a particular point within the STEM pipeline: before, during, or after college. The framework also provides achievement dimensions at each juncture.

At the first juncture, precollege socialization and readiness, familial factors, K-12 school forces, and out-of-school college preparatory experiences were the researchable dimensions of achievement. At the second juncture, college achievement, classroom interactions, out-of-class engagement, and experiential and external opportunities were the dimensions of achievement. At the third juncture, postcollege persistence in STEM, industry careers, graduate school enrollment, and research careers were the researchable dimensions of achievement.

Harper and other researchers insisted that the earlier we focus on the scholar identities of African American males, the more likely we are to develop future generations of African American male scholars who are in a position to break the cycle of underachievement (Bonner, 2010; Whiting, 2006). Harper's study provided useful insight about African American male college students' success in the United States as well as a counternarrative to the traditional thinking about underachievement. The goal of Harper's framework was to encourage researchers to consider anti-deficit reframing at different points in the STEM pipeline and within the various researchable dimensions of achievement.

Harper's anti-deficit framework was a theory worth employing to conduct a research study on African American men who attended a residential math and science school. This study sought to expand the research on Harper's anti-deficit achievement framework by looking at the experiences of high-achieving high school students attending a residential math and science school. This study focused on the precollege socialization and readiness juncture of the pipeline. This study asked participants to reflect on how their experiences at a residential math and science school prepared them for college achievement and postcollege persistence in STEM. Harper's framework guided the development of the study, interview questions, review of the data, the narrative stories of participants, and the themes that contributed to successful transitions in education for African American male students.

Harper's framework highlighted factors relevant to African American male success in higher education. Harper demonstrated the need to progress from the deficit approach and seek the positive factors that influence African American male degree completion. Harper identified several factors that assisted with success for African American male students in higher education environments. In addition, Harper identified support as an important factor. Support comes in

many shapes and sizes. From the support that students receive from their family, to the encouragement of an instructor or peer, to financial support, all represent key components in creating an environment where students may have a greater likelihood of flourishing.

For African American male college students at PWIs, the adjustment and transition to college is unique. Often, it is viewed from a deficit approach by highlighting the factors or barriers that impede achievement. This study attempts to use both Harper's anti-deficit framework and Schlossberg's transition theory to examine a positive approach to understanding the experiences and achievement of African American male students in a rigorous STEM residential environment.

### *Schlossberg's Transition Theory*

Schlossberg's transition theory provides insights into the factors related to the transition, the individual, and the environment, that are likely to determine the degree of impact a given transition will have at a particular time (Evans, Forney, Guido, Patton, & Renn, 2010). Schlossberg (1984) identified a primary goal of her theory as operationalizing variability to develop a framework that would facilitate an understanding of adults in transition and aid them in connecting to the help they need to cope with the process of living. Schlossberg continued to develop her model as she integrated the ideas of researchers as well as the critique of her own theory. Although originally used for older adults, Schlossberg's model helps us to understand the perceived demands and coping techniques used by those in transition, including young, emerging college students (Evans, Forney, & Guido-DiBrito, 1998).

Schlossberg (1984) defined transition as an event that results in a change in relationships and routines in critical areas of life, such as work, family, health, or economics. This definition highlights the concept that life transitions alter relationships, roles, and beliefs (Goodman,

Schlossberg, & Anderson, 2006). The balance of an individual's assets and liabilities determines the outcome of the transition (Schlossberg, 1984). For example, how an individual perceives the transition depends on the amount of positive and negative attributes a person believes is involved in the transition. This in turn produces the outcome of the transition, good or bad. If an asset is greater than the liability, then the transition will be less difficult (Schlossberg, Waters, & Goodman, 1995).

Schlossberg, Waters, & Goodman (1995) identified three types of transitions: (a) anticipated, (b) unanticipated, and (c) nonevents. Anticipated transitions are events that are expected, such as graduating from high school or college. In this case, an individual can prepare for the event. Unanticipated transitions are unexpected and alter an individual's routine. The unanticipated transition (e.g., sudden death of a family member) does not allow for planning. Nonevent transitions are expected events that fail to occur, such as not getting a job or not making the athletic team after tryouts.

Goodman, Schlossberg, and Anderson (2006) envisioned someone successfully navigating a transition in three steps: (a) identifying the transition and how much it will change a person's life, (b) taking stock of coping resources (the 4S system), and (c) taking charge and strengthening resources. Schlossberg identified four major factors that influence a person's ability to cope with a transition: situation, self, support, and strategies (4S's).

An understanding of the situation includes examining elements connected to the transition, such as the cause, timing, and duration of the transition; the control over the situation; whether a role change is involved; previous experience with similar transitions; and one's self-assessment of whether the transition is positive or negative. An understanding of self is classified into two primary categories: personal and psychological. Personal, or demographic,

characteristics affect how an individual views aspects of life, such as socioeconomic status, gender, age, and race. Psychological resources include ego development, outlook, commitment, and values. Support includes family, peers, coworkers, classmates, and organizations and institutions. Strategies are generally divided into three categories: (a) those that modify the situation, (b) those that control the meaning of the problem, and (c) those that aid in managing stress in the aftermath (Evans, Forney, & Guido-DiBrito, 1998).

Schlossberg's transition theory has been utilized to understand the transition processes of first-generation college students of color (McCoy, 2014), first-year transition to a PWI (Underwood, 2012), and an African American living-learning community at a PWI (Bennett, 2014). At the secondary level, Schlossberg's theory has also been utilized to better understand the processes for African American students who transition from middle to high school (Holcomb-McCoy, 2007) and the experiences of African American students transitioning from a traditional school to alternative school (Davis, 2017).

Evans et al. (2010) stated that both quantitative and qualitative studies on Schlossberg's transition theory are needed. Evans et al. shared that qualitative research might present a better opportunity to research transitions holistically, as perceived by the individuals experiencing them. In addition, Evans et al. called for additional research related to marginalized student populations "to increase our understanding of, and ability to assist with, various transitions that these students experience while moving into, through, and out of higher education settings" (p. 226). This study applies these recommendations to extend Schlossberg's theory to understand the experiences of African American men who attended and graduated from a residential math and science school.

Schlossberg's model was applied as a theoretical framework for this study as it provides a lens to explore specific strategies used by African American male students during their transition process at a residential math and science school. Schlossberg's model was helpful in understanding African American male student experiences at a residential math and science school, which is predominantly White, given the likely variation in individual responses to challenges at the school.

In the next section of the chapter, I discuss African Americans in STEM. Specifically, I will briefly look at the STEM gap for African American students, supportive environments for African Americans in STEM, and African American gifted learners.

## **African American Students**

### ***The STEM Gap***

During his presidency, former President Barack Obama recognized the value of STEM education by making it a priority for his administration. As stated in Chapter 1, President Obama stated that in order for the United States to meet evolving workforce needs, the country would need to add one million more STEM professionals by 2022 (U.S. Department of Education, 2016). President Obama noted that in order to meet this need, the country should continue to support and encourage degree completion, especially for African Americans and others who are underrepresented in these fields (Handelsman & Smith, 2016).

A barrier for African American students entering the STEM field is access to quality education. For example, 33% of public high schools serving predominantly African American students offer calculus (U.S. Department of Education, 2016). Only about 40% of public high schools serving predominantly African American students offer physics (U.S. Department of Education, 2016). According to national and international mathematics assessments, 50% of

African American high school students score 39 points lower than White American students (Stinson, 2006). African American students are less likely to take advanced courses in mathematics because 45% of African American students begin high school in a mathematics class at a level lower than algebra (Noble & Morton, 2013). Fewer than 10% of African American students complete the college prep high school mathematics sequence of algebra, geometry, trigonometry, and precalculus (McGee & Martin, 2011). These course selections further affect access to postsecondary and occupational STEM opportunities (Singh, Granville, & Dika, 2002).

This lack of access to foundational STEM skills puts African American students at a disadvantage in preparing for advanced STEM courses and careers. In addition to gaps in access, African American students as a whole exhibit achievement gaps that are often established by the fourth grade with little change thereafter. By the eighth grade, less than one-third of African American students are proficient in math and science in high school. African American students represent 16% of all students, but only 9% among students enrolled in an Advanced Placement (AP) course (U.S. Department of Education, 2016). AP courses are high school courses through which students can acquire college credit. For example, in 2014, only 4% of African Americans earned an AP test score that qualified for college credit (U.S. Department of Education, 2016). In nine states, including Mississippi, which has the highest number of African Americans, no African American student took the AP computer science exam (U.S. Department of Education, 2016).

The ACT is a standardized test used for college admissions in the United States and is operated by a nonprofit organization with the same name. To provide students and educators with more insight into the critical aspects of college readiness, the ACT introduced a STEM

score on ACT student score reports in fall 2015. This score is derived from the ACT mathematics and science scores and represents students' overall performance in these subject areas. The ACT College Readiness Benchmark in STEM was added to the ACT score report in 2016–17 academic year. The ACT STEM Benchmark resulted from research that demonstrated that academic readiness for students pursuing a STEM major may require higher scores than previous ACT College Readiness Benchmarks in math and science (Mattern, Radunzel, & Westrick, 2015).

The ACT STEM Benchmark was developed using the same methodology as other subject area ACT College Readiness Benchmarks. Typical grades in first-year college STEM courses (calculus, general biology, general chemistry, and physics) were combined into a single course success model to determine the ACT STEM score associated with a 50% chance of earning a B or higher and about a 75% chance of earning a C or higher in those courses. The resulting ACT STEM Benchmark is 26. Based on that benchmark, only 20% of students in the 2016 ACT-tested high school graduating class were ready for first-year STEM college courses.

ACT STEM scores are related not only to succeeding in individual math and science courses but also to achieving longer-term outcomes. Mattern, Radunzel, and Westrick (2015) showed that students pursuing STEM majors who met the ACT STEM Benchmark were more likely to earn a cumulative grade point average of 3.0 or higher, persist in a STEM major, and earn a STEM-related bachelor's degree than those who failed to meet the benchmark. Additionally, ongoing research suggests that providing STEM readiness information to prospective students may help to facilitate the transition to college by aligning students' expectations with course demands.

According to the 2016 STEM report for the state where Pioneer Academy is located, 50% of high school graduates had an interest in STEM. African American graduates made up approximately 20% of that state's graduates who had an interest in STEM. Despite the interest in STEM, only 15% of African American high school graduates met the mathematics standard, 11% met the science standard, and 3% met the STEM standard as defined by the ACT College Readiness and STEM benchmarks.

The ACT data highlights the existing problem for African American male students, yet there are African American males who continue to excel in postsecondary environments. Entrance to college, reinforced interest in STEM disciplines, better access to STEM courses, better grades in those courses, and AP course access are all predictors of success in STEM fields. This study sought to understand the experiences of African American males who had achieved success in a STEM environment by examining their transition to and through a residential learning environment. The next section of this chapter reviews the literature on supportive environments for African Americans in STEM.

### ***Supportive Higher Education Environments***

Research shows that African American students can be successful in STEM majors if they are appropriately challenged and supported within the learning environment. Allen (1992) suggested that African American students, like many individuals, are more successful in environments where they feel valued. Historically Black Colleges and Universities (HBCUs) have been leaders in educating successful African Americans (Gasman, 2017). Comprised of 105 institutions, HBCUs enroll 11% and graduate nearly 20% of the total number of African American undergraduate students (Palmer & Wood, 2012).

Even though our nation's HBCUs represent just 3% of colleges and universities, they produce 27% of African American students with bachelor's degrees in STEM fields (U.S. Department of Education, 2016). HBCUs have implemented practices to support student success in STEM fields. These efforts by HBCUs result in their students' increased ability to obtain rich professional experiences, research opportunities, and mentorships; navigate through courses and financial challenges; and achieve post-baccalaureate success. In order to increase STEM persistence and graduation rates, HBCUs have established bridge programs that encourage students to develop strong relationships with faculty, administrators, and program peers (Burt, Franklin, & Fries-Britt, 2012; Moore, Madison-Colmore, & Smith, 2003).

The Quality Education for Minorities Network (QEMN) conducted an audit in 2007 of approximately 11,000 African American male students who had obtained bachelor's degrees in STEM from HBCUs. They found that 410 African American male students received a degree in engineering, 125 received a degree in physical sciences, 3 received a degree in geoscience, and 736 received a degree in mathematics and computer science (QEMN, 2010). Those that did major in STEM said their families and their university faculty were pivotal motivating forces (Williamson, 2010). One HBCU had a STEM scholars program that was strategic in ensuring retention of and graduation by African American students by incorporating a supportive family environment through offering living-learning communities, hiring caring teachers, communicating high expectations, instituting academic rigor, and developing students' professionalism (Kendricks & Arment, 2011).

Student success at HBCUs can be attributed to multiple factors, including how HBCUs cultivate an ethos of familial success and provide services for students (Gasman, 2017). HBCUs foster an ethos of belief in the success of students, and faculty and staff members regularly and

consistently communicate this vision to their students. Several HBCUs emphasize collaboration over competition through cohort models. These cohort models provide students the opportunity to understand that their success is deeply tied to others and not restricted to their own work. HBCUs are important not only to African Americans but to the nation as they maintain a prominent role in preparing students to meet urgent national priorities in STEM fields, in filling teaching jobs, and in uplifting boys and men of color (U.S. Department of Education, 2014).

In general, much of what we know about African American undergraduates at PWIs concentrates on the academic and social obstacles they face (Harper, 2013). Harper (2013) stated that nearly everything published about African American undergraduates at PWIs focuses on deficits and negative forces instead of enablers of achievement. However, there is a small but growing amount of literature that highlights success factors for African American students at PWIs. Over the past decade, studies show that at PWIs, confidence and strong self-identity allowed African American males to succeed in a difficult environment. Developing strong peer, familial, spiritual, and mentor relationships contributed to the confidence needed to persist at a PWI (Strayhorn, 2008; Williamson, 2010). Many of the contributing factors addressed a common challenge identified by African American males at PWIs: the environment.

A recurring theme in studies of African American male students at PWIs is that the environment is not supportive of the needs of African American male students. However, Museus, Palmer, Davis, & Maramba (2011) found that some PWIs, described in the study as Generating Ethnic Minority Success (GEMS) institutions, showed considerably higher than average minority retention and graduation rates. Museus et al. found that GEMS colleges were intentional in developing targeted supported programs, were successful at “humanizing the educational experience” for all campus constituencies, and instilled an “ethos” characterized by

institutional responsibility. Museus et al. found that these schools were proactive in creating a supportive environment for minority students, which yielded positive outcomes (Museus, Palmer, Davis, & Maramba, 2011). The features and characteristics of GEMS colleges were comparable to the long-standing missions and traditions of HBCUs.

### ***Supportive Factors for Gifted African American Male Learners***

For this study, it was relevant to review literature on the success of African American males who were considered gifted and talented learners. Some African American male students were identified for, or made the decision to engage in, gifted education. Grantham (2004) found that positive interactions with teachers and the academic environment led their motivation to participate in gifted classes. Participants in the study noted that positive peer influence, strong teacher support and encouragement, and the ability to take higher level classes were important to their success (Grantham, 2004). The students in Grantham's study valued their academic talent and were able to overcome stereotypes.

The major concern for African American males who do not engage in gifted and talented education is that they are not doing as well academically as others (Moore, Ford, & Milner, 2005; Whiting, 2006). This is partially due to gifted and talented education programs focusing on the recruitment of African American males rather than on their retention (Moore et al., 2005). As Moore et al. (2005) argued, to ensure that African American males' engagement in gifted and talented programs persists, retention programs that encourage self-confidence, promote leadership, articulate long-term goals, and expect community service needed to be implemented. Additional research has shown that the intersection between race and giftedness should be nurtured so that educators of gifted and talented African American males are culturally

competent and utilize culturally relevant teaching and learning strategies that lead to the successful gifted and talented African American males (Moore et al., 2005; Rodgers, 2008).

Many of the experiences of gifted Black men in college mirror those of all students. They encounter the problems associated with adjusting academically and socially to the college environment. They come from very diverse cultural, social, and economic backgrounds. They have concerns just as other students do about choice of major and career opportunities (Kerr & Colangelo, 1988). Many of these students are highly successful, ambitious, and able to accomplish impressive academic and personal goals during their collegiate careers. Unlike White students, African American male students are likely to face racial hostility and stereotypes more frequently. Nevertheless, because of their identification as “gifted,” they have unique experiences that warrant individual attention. Many of the experiences that gifted African American men have are shaped by factors within the African American community as well as factors outside the community.

Bonner (2010) identified alternative ways to evaluate issues that threaten the achievement of gifted African American males. Bonner’s view highlighted factors that led to achievement rather than those that prevented it. Bonner conducted two case studies to propose an alternate method of viewing African American males through a positive lens. The case studies were conducted at two separate institutions: one PWI and one HBCU in the late 1990s. Bonner summarized four important categories that impacted participants’ success: (a) family influence and support, (b) factors that influenced college selection, (c) self-perception, and (d) institutional environment.

Bonner (2010) found that his participants described family influence and support as key factors that assisted them to succeed in college. Participants shared that they received

psychological and emotional support from their family while pursuing their undergraduate degree. Support ranged from phone conversations to campus visits. These participants felt that their parents were involved in their entire educational career. Parents provided basic skills in addition to a focused mindset that helped students overcome the challenges of higher education. Bonner explained that the visible support of families, in the majority of the participants' lives, led to institutions paying more attention to the success of the students because they knew that there was a strong family unit supporting the student (Bonner, 2010).

The ability to develop meaningful professional relationships with college administrators and faculty, along with the ability to gain support for their studies, were among the most significant factors influencing college selection. Involvement from parents who attended college served as another key factor in the college selection process. These parents were able to provide valuable insights on campus support systems, grants, classroom sizes, and college expectations.

Bonner found that respondents' perception of self and friends were incongruent with the administration's and family's perception of the participant. Due to the fear of others' reactions, gifted African American males were reluctant to boldly state their giftedness. Participants in the study found that their institutions were not as prepared to support and encourage them as they would have liked. Bonner also stated that there were different expectations for African American males who had superior preparation than for those who were gifted but came from weaker educational backgrounds.

Bonner found that the institutional environment served as the fourth important factor that led to the success of participants in his study. The institutional environment included the academic assistance and guidance needed to successfully matriculate. Each institution creates an environment that plays a significant role in the success of their students. For the past 30 years,

many colleges and universities have intentionally developed communities to encourage student success using factors similar to those identified by Bonner.

In using a qualitative approach, Bonner was able to capture the core of untold stories from these college students. Although Bonner's study identified factors that contributed to the success of gifted African American males, he recommended further research concerning institutional support for gifted African American male students. In particular, Bonner highlighted the need for greater attention to and emphasis on faculty relationships, peer relationships, and the institutional environment. The review of Bonner's research spoke to the multifaceted and complex nature of understanding African American male success. Although he recognized that race was an important consideration, he recognized that it should not be a dominant consideration.

In 2017, Fries-Britt sought to understand the factors that shaped the lived experiences of African American students studying in STEM fields by reviewing a qualitative database that spanned over 20 years. Three nonacademic themes that impacted success for African American males in STEM fields emerged: (a) sense of confidence, (b) development of meaningful relationships, and (c) ability to recognize and navigate stereotypes, biases, and racism.

Many factors reinforced confidence in African American males when they encountered barriers. Several of the students in her study were second- and third-generation college students with one or both parents having completed college and in some cases, graduate school (Fries-Britt, 2017). The students' confidence in STEM increased due to their early exposure to STEM camps and internships and working with mentors. This exposure prior to college added to students' sense of connection to STEM and their understanding of the academic requirements

(Fries-Britt, 2017). Success in rigorous courses further enhanced students' confidence and served as an important part of building their foundation.

Consistent with the findings with Bonner's study, Fries-Britt also recognized the importance of meaningful relationships with peers and faculty to student success in STEM. In particular, while in high school, participants in her study shared their stories of being one of a few African American students in honors or AP classes. They also felt like they were attending a school within a school with their less academically talented African American peers. Participants shared stories about being teased or feeling uneasy about the access they were getting to rigorous courses and preparation for college (Fries-Britt, 2017). Students in the study often reported better relationships with peers in college than in high school. Nearly all of the males in their study were able to find a supportive group of peers in college, with the most meaningful relationships and supportive collegiate environments occurring on HBCU campuses. Both at PWIs and HBCUs, African American male students sought meaningful relationships with faculty and supportive relationships with peers.

The African American males who attended PWIs reported being academically tested while overcoming stereotypes and biases on a regular basis. Participants shared that the biases they encountered reinforced the need for them to know who they were and to find ways to build their confidence. Making it through difficult experiences helped participants build tenacity (Fries-Britt, 2002). Although students were able to push through and navigate barriers and obstacles, Fries-Britt noted that these barriers often keep underrepresented minority populations from entering the STEM field.

A goal of this study is to contribute to the literature focusing on African American male success by highlighting actual success stories. Furthermore, for the purpose of this study, it is

important to review literature that emphasizes African American male student success within a STEM-focused academic environment. Existing literature provides insight into collegiate environments that share similar characteristics with the residential math and science high school environments in this study. The next section of Chapter 2 will review the literature on residential learning communities.

## **Residential Learning Communities**

### *History and Overview*

In the early part of the 20th century, Alexander Meiklejohn and the Experimental College at the University of Wisconsin (1927–1932) revealed how living-learning communities might enhance the learning experience for students (Rudolph, 1990; Tinto, 2003). Faculty and students worked together to develop a collaborative living and learning environment where all individuals could engage in common academic pursuits, resulting in a truly holistic environment. At the Experimental College, faculty and students were housed together and studied a prescribed curriculum that incorporated the study of two or more civilizations (Meiklejohn, 2001).

In these environments, faculty and students intentionally developed residential communities that actively involved the creation of a shared learning process and a purposefully designed curriculum. During his time at the Experimental College, Meiklejohn implemented several innovative teaching strategies that are still used today. Academic advising, team teaching, active learning approaches, and student seminars represent several of the strategies developed to create an integrated curriculum. The concept of community and learning as an integrated philosophy took off during the late 1920s and early 1930s.

With the introduction of the Servicemen's Readjustment Act of 1944, Title IV of the Housing Act in 1954, and the Civil Rights Act of 1964, access to college campuses for hundreds

of thousands of students and their families reached new heights (McClellan, Stringer, & Associates, 2009). With increases in federal and state funding, American colleges and universities expanded on-campus housing options to keep up with increasing student enrollments. Residential communities became a priority for the continued growth of college campuses.

At that time, construction of residential facilities was prioritized above creation of learning communities due to student demand for on-campus housing. As the number of students residing on campus increased, administrators began to recognize personal and academic problems associated with larger residential communities. The concept of a dormitory, a building where one simply ate and slept, gave way to residential communities, where students collectively lived and learned amongst their peers and faculty members (Rudolph, 1990).

The field of student affairs grew during this time. Student affairs developed to join academic and business affairs as a major division of college and university life (Kuh, 2000). Residence life staff members worked with other areas of the college community to create a blueprint for living-learning communities. The goal of these communities included the development of seamless learning environments, which addressed an enhanced educational experience, higher levels of retention within the residential community, and stronger persistence rates within the institution.

Over the last thirty years, living-learning communities have become an integral part of higher education at research universities, community colleges, and liberal arts colleges (Stier, 2014). Many exist to address institutional concerns such as engagement, student persistence rates, transition to college, and academic success. The literature suggests that living learning communities provide multiple benefits to their student participants (Szelenyi & Inkelas, 2011).

These benefits include a greater likelihood to discuss academic, career, and sociocultural issues with their peers; stronger relationships and engagement with faculty; assistance with social and academic transition to college; positive retention outcomes; and greater satisfaction with their residential environment (Inkelas, 2008; Blackhurst, Akey, & Bobilya, 2003).

Colleges and universities often refer to living learning communities and similar programs using different names: including residential learning communities (RLCs) and living-learning communities (LLC). A residential learning community (RLC) often describes a type of residential program that possesses all or some of the following characteristics, regardless of the time such a program is developed and the label applied to it. Core elements common to RLCs include: (a) purposeful, formally structured academic, social, cultural, and other extracurricular enrichment activities; (b) a sense of community among students and staff by requiring a cohort of students to live in the same residence hall; and (c) opportunities for students to integrate their college experiences by linking classroom and out-of-class learning.

Some RLCs involve curricular integration, interdisciplinary teaching, and collaborative learning by requiring residents to take one or two common courses together. These courses may be taught in the residence halls where participants live. Some RLCs involve faculty in residence, faculty fellows, or have faculty offices located near or within the residential communities. Students and faculty in the residential community are expected to participate in common activities, both social and cultural, inside and outside the classroom.

RLCs can be classified into six broad categories: (a) foreign language or culture-based houses occupied by students who study or share an interest in a specific foreign language or culture; (b) themed houses for students who share a major or an interest in a particular topic; (c) honors housing, which recruits academically talented students; (d) general RLCs that aim to

promote overall academic achievement, recruiting students from diverse backgrounds; (e) talent- or arts-themed houses, occupied by students who have a shared interests in the arts; and (f) RLCs focused on activism, enrolling students who share an interest in a social cause, such as women's studies or environmental science (Dong, 2005).

The National Survey of Efforts to Improve Undergraduate Student Success and Retention reported that 90% of participating institutions had implemented some form of learning community program; 56% of these programs were connected to residential living programs and 52% had a common intellectual theme (John N. Gardner Institute for Excellence in Undergraduate Education, 2011). In 2008, the Residential Learning Communities International Clearinghouse estimated that there were over 200 of these such programs on 73 campuses nationwide (Inkelas, 2008). Some of the positive factors associated with RLCs include peer interactions; student-faculty interactions; student involvement in campus activities; and integration of students' academic, social, and cocurricular experiences. Research has shown the importance of these factors in creating favorable conditions for student learning and development to occur (Astin, 1993; Pascarella & Terenzini, 1991).

Research has indicated that, compared with their peers in conventional residence halls, students living in an RLC report greater informal interactions with faculty and peers; stronger intellectual engagement in their living environment (Clarke, 1988; Inkelas & Weisman, 2003; Pascarella & Terenzini, 1981); higher cognitive and intellectual gains (Inkelas & Weisman, 2003; Pascarella & Terenzini, 1981); and a positive social climate within their living arrangements. The literature has also indicated that students living in RLCs tend to have higher retention rates than those in conventional residence halls (D'Souza, 2003; Pike 1999). Further

studies are needed to compare the residential environments at colleges to those at residential high schools.

### ***STEM-Focused College Communities***

Given the challenges universities have experienced in STEM degree production, institutions have begun to develop living-learning programs exclusively targeting students interested in pursuing STEM majors and careers. Within recent years, a review of the experiences of women in STEM-focused RLCs has highlighted both the challenges that these women faced and the opportunities provided by RLCs to help overcome barriers. These barriers included self-efficacy, unwelcoming environments, and concerns about academic-career fit (Allan & Madden, 2006; Concannon & Barrow, 2010; Grays, 2013; Seymour & Hewitt, 1997).

An example of an RLC focused on STEM persistence for women is WISE (Women in Science and Engineering). Programs like WISE positively impact students' self-perception as a minority in STEM and play a significant role in their successfully overcoming barriers (Grays, 2013). Research has also shown a positive long-term relationship between female undergraduates who participated in a living-learning community and their intention to attend graduate school to pursue a STEM graduate degree (Szelenyi & Inkelas, 2011).

The literature has shown that living-learning programs can have a positive impact on STEM persistence (Soldner, Rowan-Kenyon, Inkelas, Garvey, & Robbins, 2012; Stern, Powell, & Ardoin, 2008). RLCs have the ability to improve STEM degree production on college campuses. First, students who participate in RLCs report better and more frequent conversations with peers related to more positive outcome expectations, greater interest in STEM, and better college grades (Soldner et al., 2012). Second, students participating in a STEM-focused RLC report positive outcomes and experiences related to interaction with faculty, which also had a

positive impact on STEM pursuits and college grades. Third, students living in STEM-focused RLCs recognized the importance of a socially supportive residential environment and the impact that it has on academic success (Soldner et al., 2012). Similar studies on African American male students would provide valuable information to identify the factors that assisted them in the pursuit of STEM majors and careers.

### ***State Residential Math and Science High Schools***

State residential math and science high schools represent a specific type of a boarding school. Boarding high schools have a long history in American education, dating back to 1789 when Phillips Academy was founded. The more recent state-supported residential math and science school movement began in 1963, when then-Governor Terry Sanford of North Carolina established the first residential summer program for gifted students (Pfeiffer, Overstreet, & Park, 2009). Fifteen years later in 1978, the North Carolina General Assembly, under the leadership of North Carolina Governor James Hunt, proposed the first residential academic year high school for gifted students. In 1980, the North Carolina School of Science and Mathematics opened (Kolloff, 2003).

Stanley (1987) argued that more states should follow North Carolina's lead in creating a state-supported residential school focused on math and science education. Stanley recommended that every state with at least 300 annual National Merit Semifinalists establish a residential high school for math and science. Legislators, educators, and community leaders recognized that many of the best students in their states were not appropriately challenged (Pfeiffer et al., 2009) and that state residential math and science schools could provide a wide variety of advanced courses, opportunities for acceleration, and unique research experiences. In addition, they recognized the potentially significant benefit from gifted students' interacting with other highly

capable students (Cox, Daniel, & Boston, 1985; Robinson, 1999). Several states responded to this recommendation and followed North Carolina's lead. The growth of state residential math and science schools increased considerably in the 1980s. Today, there are 15 such schools educating students across the country.

In comparison to the elite boarding schools located primarily in the Northeast, the majority of residential state math and science schools are located in the Midwest and Southeast. With fewer urban centers and considerable numbers of rural school districts and students in these regions, residential state math and science schools present an opportunity to consolidate resources into a single venture to address the academic needs of highly motivated students (Roberts & Alderice, 2015). To reach these populations, state residential math and science schools use a variety of techniques to guide the admissions and recruitment processes. The success of each school relies on identifying, recruiting, and selecting talented individuals who will ultimately be motivated and encouraged to graduate. Roberts and Alderice (2015) explain one of the benefits of state-supported residential math and science schools: "By including a required residential component, programs are able to draw students from across their state in ways that local or regional magnet programs cannot while ensuring equity in access to all students" (p. 138).

Research on and evaluation of state residential math and science schools is limited (Cross & Frazier, 2009; Pfeiffer et al., 2009, Roberts & Alderice, 2015). The research that does exist suggests that these schools play a vital role in the STEM education conversation. In the review of the literature, three important contributions that state residential math and science schools make to the educational environment emerged: (a) STEM academies, (b) extensive research opportunities, and (c) intermediate and advanced science and math course offerings.

The majority of schools identify as STEM academies. This is an important finding, particularly in terms of the national and global pressing need for a pool of highly talented individuals with aptitude, interest, and knowledge in the critical fields of science, technology, engineering, and mathematics. Though they view themselves as STEM academies, state residential math and science schools also provide extensive research opportunities for their students. All 15 state residential math and science schools reported that their students are exposed to research, and on average, spend approximately six hours in a research lab per week (Pfeiffer, et al., 2009). In addition, almost all the schools provide their students with access to outside labs and facilities in support of research. Pfeiffer, Overstreet, & Park found no evidence of similar research opportunities for bright students attending traditional U.S. public high schools (Pfeiffer, et al., 2009).

State residential math and science schools offer an extensive array of intermediate and advanced science and mathematics courses. The course offerings at the residential academies greatly exceeds the number of advanced science and math courses offered in public high schools nationwide. Rural schools and small-town schools are even less likely to offer advanced science or math courses, and this lack of depth in math and science curricular content is of concern to experts (Roach, Niebling, & Kurz, 2008; Cogan & Schmidt, 1999).

The goals of state-funded residential math and science schools are to support the academic development of students driven to pursue STEM careers and to encourage talented individuals to remain in and benefit the state (Roberts & Alderice, 2015). Students admitted to these state residential schools leave a traditional high school environment before graduation and enter a world surrounded by high-ability peers on a daily basis (Cross & Swiatek, 2009). Most

of these schools operate within the oversight or jurisdiction of a college or university, enabling STEM high school students to enroll in advanced, university-level STEM courses.

Students who attend a state residential math and science school have the unique opportunity to attend a residential high school where all students have expressed an interest and excelled in math and science courses. State residential math and science schools provide structured academic, social, and cultural experiences that help to provide a sense of community and create an opportunity for students to connect inside and outside of classroom experiences. State residential math and science schools have many if not all of the same characteristics of a college or university RLC.

### ***African American Male Students at Residential Math and Science High Schools***

The literature regarding the experiences of African American male students at state residential math and science schools is scarce. Of the literature that exists, one segment focuses on the reasons that African American students chose not to apply to state residential math and science schools. However, other research has provided examples of success for African American male students who ultimately enrolled in state residential math and science schools. This section will explore both segments of the literature.

Jones (2009, 2014) highlighted that achieving racial diversity at most state residential math and science schools was challenging due to a variety of factors, including parental consent and education, relocation resistance, and lack of understanding of the school. Jones (2014) discovered that minority families often did not get past the unknowns and the public relation pieces of the school's reputation. For example, minority families often failed to recognize support systems available to students at state residential math and science schools, such as counseling and residential life staff. Jones argued that diversity would increase if more state

residential math and science schools provided greater detail of information about the school's support systems, residence hall policies, hidden costs, and success stories of its graduates.

Desphande (2013) indicated six factors that prevented applications by minority populations, including African Americans, at a residential math and science school in the Southeast: (a) information, (b) parental support, (c) school support, (d) distance, (e) peer support, and (f) perceived difficulty. Within the African American community, the percentage of African American students who applied to the school (14%) lagged behind the overall percentage of African American 10th graders in the state that were eligible to apply to the school (33%). Desphande recommended that, in order to improve diversity, state residential math and science schools should encourage "student ambassadors" to go back into their home communities to discuss their experience, create or expand summer enrichment programs, and recognize teachers who were able to play a role in a student's development before that student got to the school. Both Jones and Desphande acknowledged the importance of personal narratives or stories to attract and engage potential students to attend a state residential math and science school.

Two studies (Eatmon, 2007; Coleman, 2014) focused on the experiences of African American students at a state residential math and science school. Students in these studies were highly talented in math and science. The studies provided a glimpse of the factors that contributed to the students' success at these schools. Common factors associated with success included: (a) being motivated, challenged, and successful in the classroom; (b) positive racial identity; (c) supportive peer group; and (d) participation in leadership activities. Furthermore, African American males wanted to change negative stigmas associated with African American males, which motivated them to do well in the classroom and also to continue to engage in

STEM (Eatmon, 2007; Coleman, 2014). These students had a demonstrated record of achievement, going against the stereotype of underachievement for African American males.

These studies also highlighted the importance of developing social identities in combination with racial identities. Outside the classroom, students chose their peer group based on the student population with whom they felt most comfortable. Regardless of their peer group selection, study participants did not shun their academic success in favor of peer acceptance. Being incorporated into a high-caliber academic community while also developing a sense of racial identity influenced the way the students viewed their education. As Eatmon (2007) noted, “Students at specialized schools must reestablish their academic presence while adapting to a residential environment requiring socialization” (p. 8).

African American students used a variety of academic and social strategies to manage difficult situations. Often, students worked inside a “population of achievers” to maintain their academic strengths and establish social connections with others for support. These academic and social strategies built resilience and strengthened students’ ability and desire to persevere (Coleman, 2014; Eatmon, 2007). As successful African American students, they continued to shatter stereotypes and preconceived notions about African Americans in all schools.

Research on the persistence of math and science high school alumni at the college level is limited and often protected by the institutions. However, the limited data that exist suggest that students who attended a residential math and science school were likely to pursue a STEM major and graduate from college. Additional research is needed to better understand the experiences of African American male students who attended a residential math and science school. Learning more about their experiences can be beneficial to a variety of stakeholders.

In this section of the chapter, an overview of RLCs was provided. The overview covered the history and expansion of these communities on college campuses over the past several decades. In addition, information regarding state residential math and science schools was provided. Though not often viewed through the lens of an RLC, state residential math and science schools share characteristics of traditional college living-learning communities. The research shows the expansion of intentional residential STEM secondary and postsecondary learning environments over the past several decades. Intentional environments can provide the resources and support necessary for continued college success as defined by the research. Further research is needed to evaluate the effectiveness of these schools, particularly state residential math and science schools. This study intended to contribute to the research on state residential math and science schools by reviewing the experiences of African American male graduates.

### CHAPTER THREE: METHODOLOGY

The purpose of this research was to explore the experiences of African American male alumni who graduated from Pioneer Academy, a state-supported residential math and science high school located in the southeast. The theoretical frameworks used for this study were Schlossberg's transition theory and Harper's anti-deficit theory. Using these theories as a framework, this study focused on how African American males navigated their high school experience and identified factors that shaped their success in a rigorous STEM education environment. This study was designed to address the following research question: What are the storied background, academic, and social experiences of African American males who transitioned into and graduated from Pioneer Academy?

To pursue this research question, I used narrative inquiry, a qualitative methodological approach, to explore and understand the stories of 12 African American male alumni as they recounted their transition through Pioneer Academy. All participants in this study graduated from Pioneer between 2006 and 2015. Each participant attended a four-year college or university upon graduation from Pioneer. At the time of their interview, seven participants had graduated from a four-year college or university with an undergraduate degree in a STEM field. The remaining five participants were seniors, at the time of their interview, enrolled in a four-year college or university with a declared major in a STEM field as defined by the NSF in 2014. The primary source of data for this study was collected by conducting an individual interview with each participant. Interviews were transcribed verbatim using a professional transcription provider, analyzed for important constructs, and organized into several themes and subthemes. Prior to the interviews, participants completed a demographic questionnaire. Each

participant also had the ability to complete an online reflection journal and an autobiographical timeline during the data collection process.

This chapter presents the methodology that guided this study. The chapter begins with the methodology, site selection, participant selection, and interview protocols. Next, I present the data collection and data analysis procedures for this study. The chapter concludes with my subjectivity statement and steps taken to advance the trustworthiness of the study.

## **Research Design**

Qualitative research is an approach that considers personal stories, reflections, perspectives, and experiences of everyday lives valuable to understanding the social world (Denzin & Lincoln, 2005; Bogdan & Biklen, 2003; Merriam, 2002). The qualitative research design served as an ideal method to address the research question appropriate for this study. The study's focus was on the participants' rich descriptions, critical interpretations, and stories of their lived experiences.

Based on the philosophy of John Dewey, "who believed that examining experience is the key to education," narrative inquiry is a qualitative research approach that seeks to reveal a wide range of human thoughts, emotions, and experiences (Clandinin & Connelly, 2000). Narrative inquiry seeks to understand the lived experiences, descriptions, and perceptions of individual experiences. It also involves an interactive and dynamic process of telling stories and listening to the stories of others.

The belief that people are social beings, and that telling their stories is primary to relating to others, guides narrative inquiry (Clandinin, Pushor, & Orr, 2007; McLeod, 2004). McLeod indicated that storytelling is central to being known by self and others and promotes social inclusion. "Sharing life stories brings the unknown to the known, allowing individuals to view

lived realities through the lens of another while opening their eyes to a new way of seeing and being in the world” (McLeod, 2004).

Connelly and Clandinin (2006) define narrative inquiry this way:

Arguments for the development and use of narrative inquiry come out of a view of human experience in which humans, individually and socially, lead storied lives. People shape their daily lives by stories of who they and others are and as they interpret their past in terms of these stories. Story, in the current idiom, is a portal through which a person enters the world and by which their experience of the world is interpreted and made personally meaningful. Viewed this way, narrative is the phenomenon studied in inquiry. Narrative inquiry, the study of experience, then, is first and foremost a way of thinking about experience.

Narrative inquiry is one form of qualitative research and is based on the ways in which individuals experience the world, make meaning of their experiences, and construct their identities through their stories (Connelly & Clandinin, 2006). Experiences are explained through storytelling. Narrative inquiry is the study of stories that individuals construct about a particular phenomenon based on their belief systems, assumptions, and values. Researchers in narrative inquiry systematically gather, analyze, and represent stories told by participants. Narrative inquiry was used for this study as it allowed for the researcher to share the direct perspective of participants on their experiences as African American male graduates of Pioneer Academy.

Through the examination of another’s story, one can gain context about the person’s background. It was important to understand how these contextual factors influenced, impacted, and played an integral role in the story that was being told. An individual’s narrative reflects not only his or her personal story and experiences but also reflects the framework of the cultural time

and place where the life story occurred. The individual and collective story was useful in forming a deeper understanding of the experiences of participants.

Narratives have the ability to provide an opposing view to societal stories and myths. The existing narrative for African American males in STEM education is presented in a negative fashion, often focused on lack of preparation, low performance, and low interest. The narratives from successful alumni from Pioneer Academy, a rigorous academic school, provide a counternarrative and a broader perspective of African American males in education, specifically STEM education. These success stories emphasize a narrative of African American males that is not often told.

### **Site Selection**

This study's participants were African American male alumni of Pioneer Academy (Pioneer). Pioneer is a state-supported residential math and science high school for juniors and seniors with a commitment to academic scholarship in a state in the Southeast. Pioneer was chosen as the site for this study for a number of reasons: (a) institutional history; b) completion rates of graduates in STEM degrees, both overall and within the African American community; (c) opportunities for STEM research and STEM career exposure; (d) residential requirements; and (e) efforts to increase percentage of underrepresented populations enrolled and matriculating at Pioneer.

**Institutional history:** Pioneer was established in the 1980s to provide challenging educational opportunities for students with demonstrated special interest and potential in the sciences and mathematics. The school's mandate was to train the state's future scientists, engineers, and mathematicians, and provide outreach to cultivate and nurture K-12 scientific talent throughout the state (Dash, 2012). Pioneer has a unique set of characteristics in

comparison to other high schools. For example, Pioneer does not provide a class rank as it finds that rank is not beneficial to students, nor does it add clarity to the character of the academic program. Additionally, Pioneer faculty members are required to have master's degrees, and many have PhDs as well as national teaching certificates. Since its inception, Pioneer students do not pay any tuition, room, board, or other student fees.

Students applying to Pioneer go through an application process that is similar to the college application process. Students must take the SAT and are required to obtain an instructor or counselor evaluation from their home high school. In addition, they must take a math and science test when attending a mandatory open house session. Pioneer is required to admit roughly the same number of students from each congressional district in the state. Applicants compete for admission within their own congressional district rather than competing against students from all across the state. Some congressional districts have a greater number of applicants as well as a greater number of qualified applicants. Admission rates to the school are consistently below 30%. Pioneer routinely receives 1,200 to 1,400 applications each year for approximately 340 available places.

Pioneer falls under the umbrella of its state higher education system. As a member of that system, Pioneer is assured flexibility in curriculum, teaching approach, and class scheduling. Because Pioneer does not fall under the umbrella of its state's department of public instruction, students enrolled in the Pioneer residential program do not take state curriculum assessments or end-of-course or end-of-grade tests. Pioneer has established articulation agreements with all of its state's public colleges and universities as well as a few private colleges and universities. These articulation agreements make it possible for Pioneer students to receive college-level credit for completed courses at Pioneer. In some cases, students can earn enough

credits during their two years at Pioneer to enter college with a similar number of credits as a college sophomore or junior, essentially saving them a significant amount of time and tuition expenses.

Pioneers is one of several state residential math and science schools across the nation with an educational focus on STEM career preparation for its graduates. Pioneer is an active member of the National Consortium of Secondary STEM Schools (NCSSSS). The Consortium was established to provide a forum for specialized secondary schools focused on STEM disciplines to exchange information and program ideas (NCSSSS, 2019).

**Completion rates of graduates in STEM degrees:** Pioneer was selected as the research site for this study because of its focus on the STEM degree completion rates of its alumni. Over 10,000 students have graduated from Pioneer, representing every county in its state.

Among the top quintile of all U.S. high school graduates, 13.8% pursue STEM degrees. By comparison, more than 50% of Pioneer alumni receive a bachelor's degree in a STEM field (Lowell, Salzman, Bernstein, 2009). For the graduating classes from 2000 to 2009, 83.9% of all Pioneer alumni graduated from college; 60.3% graduated with a STEM major. The data also show that African American students from that time period had high degree obtainment. For example, 82.5% of Pioneer's African American alumni graduated from college. Of African American male students, 81.1% graduated from college, and 59.5% graduated with a STEM degree.

**Opportunities for STEM research and STEM career exposure:** Pioneer students are encouraged to engage in research within their mathematics, science, and humanities courses. Senior students have the opportunity to participate in formal mentorship programs that connect them to professionals in companies near the campus. These research and mentorship

programs provide Pioneer students additional exposure to outside-of--the classroom experiences that serve to expand and deepen their learning and investment in STEM fields.

**Residential requirements:** Living on campus is an important step for students in building a solid foundation for success in college and beyond. The residential experience provides students the opportunity to form connections, build a sense of community, and find their place academically and socially. Pioneer students are required to live on campus during their entire two-year enrollment at the school. During those two years, students have access to campus resources, activities, organizations, and service-learning and leadership opportunities. On-campus living also provides students the opportunity to develop life skills, such as time management and conflict resolution, that they can use beyond high school.

**Efforts to increase percentage of underrepresented populations enrolled and matriculating at Pioneer:** Over the past 20 years, Pioneer has connected to Consortium and statewide efforts to increase diversity. In 2002, the school participated in a Consortium project to increase the percentage of underrepresented populations enrolled and matriculating at Consortium schools. In 2009, Pioneer's chancellor convened a committee focused on increasing minority enrollment at Pioneer by looking at three key areas: (a) recruitment, (b) admissions, and (c) retention. Currently, Pioneer operates several leadership, research, STEM outreach, and bridge programs that contribute to the recruitment and retention of minority students.

Students who attend Pioneer have the ability to engage deeply with their learning and prepare themselves for their college experience. While at Pioneer, students have the ability to take high-level math and science courses taught by experienced faculty, and they can also participate in research opportunities as well as a formal mentorship program. They do this in a cost-free environment with the prospect of reducing their time and expenses as an undergraduate

student thanks to articulation agreements with colleges and universities. Pioneer was an ideal setting to conduct a study on the academic and social experiences of African American male graduates who attended and graduated from an academically rigorous residential school.

### **Participant Selection**

This study sought to examine the storied background, academic, and social experiences of African American males who graduated from Pioneer in order to understand how they transitioned into and graduated from the school. In an effort to gain multiple perspectives and explore information-rich cases, this study used purposeful sampling. Purposeful sampling is a process in which individuals are selected due to their unique perspectives about issues central to the study (Patton, 2002).

Using purposeful sampling, 12 participants were selected based on the following six criteria:

- 1: Gender: Male
- 2: Race/Ethnicity: African American
- 3: High School Experience: Graduate of Pioneer Academy
- 4: Time Period: Graduated from Pioneer Academy between 2006 and 2016
- 5: College Experience: Attended a four-year college or university upon graduating from Pioneer Academy
- 6: College Major: Completion of either an undergraduate or graduate degree in a STEM major or field as categorized by the NSF or selection of a STEM major or field as categorized by the NSF.

Pioneer's chancellor and director of institutional research were informed of the study and provided support by encouraging further connections to and conversations with their colleagues at the school. In qualitative research, gatekeepers are individuals who provide access to the site and help researchers identify participants for a study (Creswell, 2013). Gatekeepers are used to

assist researchers in gaining access to and developing trust with the participants being studied (Hatch, 2002). Specifically, informal gatekeepers, individuals that hold critical positions in an area in that a researcher is attempting to access, were used. These individuals were influential in providing the access needed to recruit participants and complete this study. This study's informal gatekeepers included faculty, admissions officers, and other staff members at Pioneer. These gatekeepers participated in an introductory meeting where they received an overview of the research study and were asked for names and contact information of individuals who met the criteria of the study. After gatekeepers identified potential alumni participants, alumni received an invitational email with information about the study and a general timeline. Alumni who expressed their interest in participating received a link to an online demographic survey in addition to an online informed consent form.

### **Data Collection**

In order to address the research question and the purpose of the study, data were collected through an online demographic questionnaire, in-depth interview, online journal, and autobiographical timeline. All participants completed the online demographic survey and interview. The data collected helped to identify and share the lived experiences of the participants and determine common characteristics and themes. The data collection strategies are described in further detail in the next section of this chapter.

The permission of the Institutional Review Board (IRB) of North Carolina State University was requested and granted before this study began in order to ensure the protection of the participants' human rights. This study incorporated all requirements and all recommendations made by the IRB. In addition, the chancellor and the director of institutional

research at Pioneer provided their approval for this study, and it was agreed that a pseudonym would be used for the name of the school in the final dissertation.

Before anyone participated in the study, potential participants were required to complete and submit an informed consent form. The informed consent form detailed the purpose and procedures of the study, notified participants that they could withdraw from the study at any time, and communicated that their identity and all data collected would remain confidential. Each participant was given a pseudonym to protect anonymity. The names of the colleges participants attended were also replaced with a pseudonym.

**Demographic Questionnaire:** Data collection began with an online demographic questionnaire (Appendix C). Participants answered general demographic questions about their family background, Pioneer education, and post-Pioneer education experiences. The participants also used this demographic questionnaire to indicate dates and times for interview availability.

**Interviews:** I conducted semistructured individual interviews to collect data from the participants. In semistructured interviewing, a guide is used to ensure that specific questions and topics are covered. Semistructured interviews have more structure than unstructured interviews. Semistructured interviews use specific questions that direct the conversation toward a phenomenon of interest and allow detailed information to be obtained through conversations between the researcher and the participant. The use of open-ended questions allows participants to elaborate on responses so that the researcher can obtain rich descriptions of each participant's experience.

During the interviews, my goal was to understand the lived experiences of the 12 participants and the meaning that they made of those experiences (Seidman, 1998). Each participant in this study was interviewed once. The interview gave participants the opportunity

to reflect on their life history, answer questions specific to the study, and identify metaphors, symbols, and a song that gave meaning to their experience at Pioneer. The majority of interviews lasted approximately 75–90 minutes. Each participant interviewed participated via phone. With permission from each participant, all interviews were recorded using the application Quick Time player. Each interview included informal conversation to help “break the ice” and build rapport. The use of the interview guide provided consistency and structure in each interview. Upon the completion of each interview, audio files were transferred to a secure, password-protected backup file. Each interview was transcribed and analyzed for common themes.

**Online Reflection Tool:** After the interview, participants were given the opportunity to reflect on the interview and provide additional information. An online reflection journal (Appendix D) was sent electronically via Google Forms providing participants, as they saw fit, the opportunity to submit additional information to questions they were asked during the interview. Four of the 12 participants submitted an online reflection journal that supported their responses during their interview.

**Autobiographical Timeline:** After the interview, participants were given the opportunity to reflect on the interview and provide an autobiographical timeline worksheet. The autobiographical timeline worksheet allowed participants to share information (significant people, places, and educational and professional experiences) that was important to them. No participant provided an autobiographical timeline.

## **Data Analysis**

Data analysis is the process of organizing, structuring, and interpreting large amounts of data from diverse settings, sources, experiences, and actions through a unified and organized

process (Marshall & Rossman, 1989; Polkinghorne, 1995). In narrative inquiry, data or stories are collected from research participants, and the narrative data are analyzed for common themes, metaphors, and plotlines to identify general themes or concepts (Clandinin & Rosiek, 2007). The researcher makes meaning (analysis) of the data throughout the research process instead of performing the analysis as a separate activity (Connelly & Clandinin, 2006). As a result, the process of data collection and analysis become seamless. In this study, I gathered stories of African American male student transition and success. My data analysis began at the conclusion of each interview. Throughout the analysis, it was important to analyze participants' stories by identifying connections and similarities between participants, their stories, and their shared experiences. Thus, the participants' stories served as the units of analysis that related to emerging themes.

I began the data analysis process by reading each interview transcript in its entirety, then listened to the audio recording to better understand the participant's stories and experiences before doing further analysis. I recorded my initial thoughts and impressions about the transcripts in a journal. Next, I completed four coding cycles, including thematic analysis: the first cycle coded the narrative, the second refined the narrative codes, the third coded patterns, and the fourth themed the data. Thematic analysis is appropriate for all qualitative studies, especially for studies exploring the emotional experiences of participants (Saldaña, 2015).

In qualitative research, coding is the process of assigning codes or labels to segments of text or images (Creswell, 2013). Narrative coding involved breaking each transcript down into excerpts. In each transcript, the beginning and the end of a story constituted an excerpt. A code was then applied to the excerpts. The purpose of applying codes was to note the underlying meanings behind the stories that each participant shared. After completing the first cycle of

coding for each transcript, I analyzed the relationships between the codes and noted any patterns that I observed. Next, I revised some codes to provide further clarification. In my codebook, I used labels to describe my coding (e.g.: *Level 1*, *Level 2*, etc.).

I conducted the second cycle of refining the narrative coding of each participant's data to identify overall similarities, differences, frequency, sequence, and correspondence (Hatch, 2002). The second column of my codebook, labeled *Level 2 Code (Narrative)*, reflected this coding.

The next step involved organizing similar codes into groups to establish patterns for each participant. Grouping similar codes together in qualitative research is called creating categories (Saldaña, 2015). This involved sorting second-level codes by patterns. I labeled this column *Level 3 Code (Pattern)* for each of the participants. While completing the third level of coding, I recorded notes to examine the relationships between similar patterns and analyzed these patterns.

The next stage of analysis examined all of the identified patterns to create four themes that captured the stories of African American male experiences at Pioneer. Theming the data was useful for exploring and telling the participants' stories. In qualitative research, similar ideas or categories that are grouped together to create a major idea are called themes (Creswell, 2013). Themes function as a way to categorize a set of data into an implicit topic that organizes a group of repeating ideas (Saldaña, 2015). Ryan and Bernard (2003) stated that themes can be found in the data by looking for qualities such as repeating ideas, participant terms, metaphors, and analogies. A fourth coding, labeled in my codebook *Level 4 (Theming the Data)*, identified the themes that emerged. I organized the themes to tell a collective story about the transition experiences of participants at Pioneer.

**Trustworthiness**

The interviews served as the primary source of data for this research study. Interviews were recorded and transcribed verbatim using a transcription company. It is a researcher's responsibility to provide an accurate account of the participants' experiences. In an effort to ensure creditability and trust for this study, I used triangulation. In triangulation, researchers make use of multiple and different sources, methods, and investigators to provide corroborating evidence (Creswell, 2007). For this study, triangulation involved collecting data from the demographic questionnaire, individual interviews, and online reflection journals from participants, and my notes from each interview. Participants received a copy of the transcript to be able to review, clarify, or add any additional information. Participants also received information related to the themes that emerged from the study. Participants had the opportunity to review the themes, ask questions, and share feedback.

**Subjectivity Statement**

In narrative inquiry, the researcher must build a trusting and open relationship with each participant as this contributes to the quality and quantity of the stories gathered (Connelly & Clandinin, 2006). It was necessary for me to be open and honest, and to reflect on my own experiences.

I am an African American male who has lived in two states in the Southeast my entire life. I am married to an amazing wife. We are the proud parents of two children. We have been blessed many times over and I am grateful for the life that we have with our family. I am a Christian and my faith is an important aspect of my life.

I grew up in a middle-class home in Hampton, Virginia. I am the younger of two children; my brother is eight years older than me. My parents have been married for over 50

years. They grew up in a rural county in the Southeast in the 1950s and 1960s. My mother is the oldest of 11 children and my father is the youngest of eight children. Educational opportunities for my parents were limited. After graduating from high school and getting married in their early 20s, my parents moved from their home state to another state in the Southeast. My father worked for a shipyard for over 45 years. My mother was a teacher's assistant at a state school for deaf and blind students for over 20 years. My brother and I are first-generation college students who attended Tier I PWIs. We both benefited from forming relationships with administrators and mentors while in high school and college. My collegiate experience cultivated my interest in a career in education.

Before we enrolled in college, my brother and I completed our K-12 experience in Hampton, Virginia. My brother attended a segregated elementary school until the third grade. I attended elementary and middle schools named after Confederate leaders from the Civil War. Throughout my K-12 experience, Martin Luther King, Jr. was celebrated alongside Robert E. Lee and Stonewall Jackson, two Confederate generals who fought to maintain slavery.

Growing up in this environment in the Southeast, I was exposed to the history of the state and the country at an early age. My fourth grade history class focused mostly on the Civil War, and I participated in field trips to battlefields. I recognized that race was central to my experience. My father was not a male who was Black, he was a Black male. I believe my parents raised my brother and me to be proud of our race, but we always maintained an awareness of our race.

Growing up, I was a good, but not great, student. In high school, I tried to balance extracurricular activities and academics, which did not always lead to impressive results. I was fortunate to get into a top-25, Tier I university, and I was accepted into a summer bridge program

that was designed to assist students with their transition to the university. On the first day of the program, I met with an African American dean who helped me select courses for the fall semester. During the meeting, the dean said, “You know that you are coming here weak academically.” That is the only thing that I remember from that meeting. In retrospect, the dean was probably right. However, it was the way she said it that struck a nerve. Her words didn’t create any doubt that the school was the right place for me, but I left the meeting with a chip on my shoulder that remained throughout my time at the university. During the same program, my fellow students and I heard from other administrators and staff who encouraged us that we could do well and that there were plenty of people rooting and cheering for us. I realized that week that I had a choice in whom I listened to, whom I gravitated to, and whom I choose to seek support from.

I completed my bachelor’s degree in economics and master’s degree in educational policy studies from this school. While enrolled, I was involved in a number of organizations that attempted to address academic and social transitions for students. For several years as an undergrad, I served as a resident assistant for approximately 40 male students and also as a peer advisor for first year African American students. The school maintained one of the best retention and graduation rates for African American students in the country while I was enrolled. The school’s peer advisor program significantly impacted my ability to find a mentor as a first-year student and assisted me in finding my leadership voice as an upper-class student. As a graduate student, I served as a graduate assistant for the dean of students and worked to develop and coordinate a peer support program for Asian American first-year students.

As a senior, I decided to pursue a career in education rather than in business. One of the main reasons why I chose a career in education was that I noticed very few African American

males working in education. Specifically, there were very few African American male administrators in student affairs. I believed that I would be able to showcase my ability and thought that my race and my gender would be considered a positive factor, not a negative factor, in my ability to advance my career.

In 2002, I started working at Tier I, top-10 university in the Southeast as a residence coordinator, a brand-new position. I was one of nine individuals who lived and worked on campus, interacting directly with students. By fall 2005, I was the only individual from my original cohort that remained at the university. I was able to gradually move into roles with increased scope and responsibility over the next eight years, gaining valuable experience.

In 2006, I became the assistant dean for a residential campus, and my position was reclassified to associate dean in 2012. Often, I was one of very few African American males at a meeting, on a committee, or on a task force. In my role, I was able to mentor younger colleagues, including African American males, working in student affairs by providing professional and personal advice. It was satisfying to be in a position where people valued my opinion and the career that I had built.

In June 2014, I was blessed with the opportunity to work at a state residential math and science school in the Southeast. I currently serve as the school's vice chancellor for student life. The Student Life Division includes the departments of Counseling Services, Residence Education and Housing, Dining, Student Services, Physical Activities and Wellness, Campus Safety and Security, Student Conduct, and the School Store. Our goal as a division is to support and complement the academic experience of our students and to create an environment where students consider our campus home while they are there and long after they leave.

I believe that I have one of the better student affairs positions in the country. During the five years that I have worked at a residential math and science school, I have enjoyed my experience, and I am amazed by the opportunities that students have during their short career at the school. In addition, I feel a great deal of personal satisfaction in helping students develop socially, academically, and culturally during their two years at the school. When students cross the stage on graduation day, I know I have played a role in helping them get there. That is a feeling I did not have while working at a university. I am hoping to enjoy a long career at the school.

Both my student and professional education experiences are at top-notch academic schools with residential requirements. Undergraduate students were required to live on campus for their first year, and many students chose to live on campus throughout their four-year career. My resident advisor experience was in a residential living community. At the university where I worked, undergraduates were required to live on campus for their first three years. I served as a primary residence life administrator for a variety of residential learning communities, such as a substance-free community, an arts-themed community, innovation community, and a Black cultural living group, to name a few. At my current campus, all students must live on campus during their two-year experience and are required to take residential education courses.

During my experiences at each of these schools, I became accustomed to seeing African American male students succeed. My viewpoint often runs counter to the image that has been presented in the media and in some scholarly literature. As a result, when trying to determine a research topic, I wanted to pursue a study that emphasized the positive experiences of African American men while potentially highlighting the factors that contribute to their success. I am extremely optimistic, and that carries me through my professional and personal life.

The opportunity to conduct a dissertation study on African American male STEM persistence is, in many ways, like coming home. My brother has always set a positive example for me. For example, he completed an engineering degree in 1994 and has worked for a major car company for 25 years. He benefited from numerous programs and outreach opportunities both at the high school and college level. I chose to major in economics. I also benefited from high school opportunities and mentorship programs aimed at increasing exposure to careers in STEM for African American males. I know the importance that a positive role model can have on the ability for students to succeed. Though I believe that positive influences are important for students regardless of their background, I also believe it is of heightened importance for students of color, particularly African American men.

## CHAPTER FOUR: PARTICIPANT PROFILES

The purpose of this study is to explore the experiences of African American male alumni who graduated from a residential state math and science school. The stories of high-achieving African American males who graduated from Pioneer Academy, a rigorous residential math and science high school, were elicited to answer the research question: What are the storied background, academic, and social experiences of African American males who transitioned into and graduated from Pioneer?

A qualitative, narrative inquiry approach was used to obtain rich stories to understand how the participants made meaning of their experiences within their own cultural, social, and historical contexts (John & Creswell, 2000). This study used purposeful sampling to recruit participants. Data was collected from three sources: (a) an online demographic questionnaire, (b) an online reflection journal, and (c) individual interviews. In this chapter, I will provide the participants' family and educational background as well as a profile for each participant.

### **Participant Demographics**

There were 12 participants in this study. Tables 4.1 and 4.2 present the participants' family and academic information. The average age of the participants was 24. Five of the participants were seniors in college at the time of their interview. The remaining seven participants had previously completed their undergraduate degree program between 2011 and 2018.

The majority of the participants (nine) were raised in a household where at least one parent graduated from college. Five of those participants had a father that had graduated from college. Nine participants had a mother that had graduated from college. Additionally, six participants had at least one parent with an advanced degree (e.g., master's degree, doctoral

degree, or professional degree). All participants' mothers had attended college at some point. Only two participants grew up in a household where neither their mother nor father had graduated from college with a bachelor's degree. Regarding their family structure, 10 participants were raised in a two-parent household, and two participants grew up in a single-parent household where the female was the head of the home.

As outlined in the participant selection criteria, each participant attended a four-year college or university upon graduating from Pioneer. At the time of their participation in the interview, seven participants had graduated from a four-year college or university with an undergraduate degree in a STEM field. The remaining five participants were seniors enrolled in a four-year college or university with a declared a major in a STEM field. For confidentiality purposes, the name of the residential high school, names of the participants, and the colleges that they have attended have been replaced with pseudonyms. The pseudonyms for participants in this study were: Victor, Eugene, Sean, Michael, Thomas, Jackson, Taylor, Keith, Larry, Eric, Aaron, and Darren.

**Table 4.1: Participant Family Information**

<b>Participant Pseudonym</b>	<b>Age</b>	<b>Family Structure</b>	<b>Highest Educational Attainment of Mother</b>	<b>Highest Educational Attainment of Father</b>	<b>SES Status</b>
Victor	21	Family with female head of household, no spouse present	Master's Degree	Some College	Middle Class
Eugene	25	Married-couple or two-parent family	Master's Degree	Master's Degree	Middle Class
Sean	28	Married-couple or two-parent family	Bachelor's Degree	High School Diploma or GED	Lower Class
Michael	21	Married-couple or two-parent family	Doctorate or Professional Degree	Doctorate or Professional Degree	Upper Class
Thomas	27	Married-couple or two-parent family	Bachelor's Degree	Master's Degree	Middle Class
Jackson	21	Married-couple or two-parent family	Bachelor's Degree	High School Diploma or GED	Middle Class
Taylor	21	Married-couple or two-parent family	Bachelor's Degree	High School Diploma or GED	Middle Class
Keith	29	Married-couple or two-parent family	Some College	Bachelor's Degree	Middle Class
Larry	21	Family with female head of household, no spouse present	Some College	Unknown	Lower Class
Eric	29	Married-couple or two-parent family	Doctorate or Professional Degree	Some College	Middle Class
Aaron	20	Married-couple or two-parent family	Bachelor's Degree	Master's Degree	Middle Class
Darren	25	Married-couple or two-parent family	Associate's Degree	High School Diploma or GED	Lower Class

**Table 4.2: Participant Education Information**

<b>Participant Pseudonym</b>	<b>Undergraduate Institution Pseudonym</b>	<b>College Graduation Year</b>	<b>Undergraduate Major</b>	<b>Graduate School Completion</b>	<b>Graduate Degree Field</b>
Victor	CN	2019	Psychology	No	
Eugene	CN	2015	Biochemistry	No	
Sean	CNSU	2011	Chemical Engineering	No	
Michael	NB	2019	Economics and Quantitative Social Science (Double Major)	No	
Thomas	RU	2012	Chemistry (Biochemistry)	Yes	Medicine
Jackson	CB	2019	Materials Science and Engineering	No	
Taylor	CNSU	2018	Biological Sciences—Molecular, Cellular, and Developmental Biology Concentration	Yes	Medicine
Keith	CNSU	2011	Chemistry	Yes	Pharmacy
Larry	VU	2019	Neuroscience	No	
Eric	TCAN	2011	Civil Engineering	Yes	Business Admin
Aaron	TU	2019	Computer Science, Rationality, and Thought	No	
Darren	WG & CN	2015	Political Science; Psychology	Yes	Law

## Participant Narratives

### *Victor's Story*

*“If you can make it through here, you can make it anywhere else. You just have to get through Pioneer. That’s the hardest part.”*

Victor, 21, graduated from Pioneer in 2015. He is a senior majoring in psychology at CN, a top-tier public research university in the Southeast. He grew up in a middle-class home in the central part of the state, where his mother was the head of the house. His mother, a nurse manager in a medical intensive care unit at a hospital, encouraged his interest in math and science at an early age. He did well in school and received positive encouragement from his mother and his teachers. They identified him as a strong student and started to look for opportunities as early as elementary school to challenge him:

My fourth-grade teacher was a Black woman, and she told my mom towards the end of the year that I was too smart to simply be at that school and that I needed to be in an AIG program, and I needed to be pulled out of the school and go somewhere that those kinds of programs are available.

Victor’s mother followed his teacher’s advice and enrolled him in a different school the following year. From that moment on, Victor shared that he was “self-motivated to push hard” in his academics and that he and his mother would discuss what made sense for him academically. When Victor reached ninth grade, his mother recognized he was mature enough for a residential high school. She considered it as a good opportunity even if it meant Victor’s leaving home early. At the same time, Victor shared openly that he became “bored and disgruntled” about his high school experience. He wanted to be pushed harder and stated that he

needed a different challenge. He shared his perspective on what he thought Pioneer could offer him:

So I really wanted to go somewhere that I really did feel like I belonged at. I felt like that was a school for those people that were really driven, a school for the nerds. That was a place for people who really were trying to go the extra mile, who had already kind of taken and gone through all the resources that were offered in the general education system in the state.

Victor elaborated on his decision to seek a different challenge. He jokingly compared his arrival at Pioneer to the environment portrayed in the Harry Potter series:

Pioneer was kind of this odd little bubble of itself. We used the analogy of Hogwarts a lot of times, that it was this kind of very secretive, magical place that you kind of went off to. There were all of these new resources for all of the wizards and witches out there that wanted to really go to a different level. So I appreciated that. I think I recognized the value of the education ... I think I intrinsically saw that being able to kind of have an experience close to college beforehand would pass me some residual effects later on. I think that was attractive as well.

While at Pioneer, Victor was involved in a number of outside-the-classroom leadership activities. He was a student ambassador in the admissions office, a member of the cross-country team, and participated in musical clubs. In addition, he also took part in a mentorship program, which gave him an opportunity to participate in a top-tier private university research project on autistic children. Reporting on his experience with research, Victor said that “everyone in the room was a doctor” and that listening to them and contributing to a real project was “meaningful and eye opening.”

Victor described his experience at Pioneer as both challenging and worthwhile. He recognized early in his time there that he was no longer the top student at the school or in his class. He acknowledged that the two years at Pioneer were the most challenging of his life. In describing his experience, he explained how getting a taste of what college looked like helped his transition to college:

You get a pretty accurate taste of what college stress is like. You get a real taste of it all. You get a taste of what it means to go to class, go home, but you are still at school, still have work. You have to figure out how to wash your clothes, go to practice, and find some time to eat and study afterwards. You are tired but then get up and maybe, hopefully, keep your room clean, and still apply to college, and call your mother, and all of these other little intangible things. So being at Pioneer, I had two years to do that. Two years to have a roommate. Two years to be in a hall setting, where you have lived with other individuals. All of those small things and really big things.

So, my first year at CN, was, frankly, very easy. All of the academic preparation and life [at Pioneer] made the first year a lot easier. It clicked during my junior year of college, where everything kind of molded together and I was able to really push. At that point, I realized how far ahead I actually was by virtue of going to Pioneer.... I saw that in reflection of what my friends were going through ... When I would talk to Pioneer friends, it started becoming really clear. We are really far ahead, as far as just maturity and being able to do well academically.

Victor shared that the African American community at Pioneer was strong and that it helped in crafting his racial identity:

Being at Pioneer, for me, kind of exposed me a bit more to what it meant to be a Black man in general. So that incentivized my desire to be more involved in diversity and inclusion, and Black male retention, and other things. I think that started at Pioneer because I started to become more aware of that as a racial identity and what that meant for me. Not only there, but what it would mean going forward.

To further describe being an African American male at Pioneer, Victor shared a unique metaphor:

If you go to the airport, they have the moving escalators to go to the baggage claim, and you can walk through them, and that kind of gets you through the long terminals. It's kind of like you were on the part that wasn't moving, you were on the main floor. There were a fair number of people [who], for a different number of reasons, are on the moving escalator. So in order for you to get down the terminal in the same amount of time, you'd have to run a lot faster. You have to be able to carry that same weight, the same luggage, and drag it with you, roll it with you, carry it, throw it, or whatever way you are able to do so, at the same pace as somebody else who is on a moving escalator, who can kind of just stand there, and by virtue of alumni status, or virtue of having less things to worry about in regards to race, ... don't have to worry so much about being shot by the police, don't have to worry so much about offhand comments or things like that.

Victor shared what he learned from the experience of being an African American student at a PWI:

Being the majority, you can kind of stand still and make forward progress, whereas everything for you, outside of it, every step for you has to be willful and a pretty big stride. You are kind of jogging when you are not moving, then when somebody is driven

and they are running on the escalator, you have got to sprint with everything that you have to even keep up. So for people to pass them, and for a lot of us, I think we did, to an extent. That doesn't always show what people had to do to keep up in that regard. So for them on the escalator, you're just kind of keeping up, and they're not. So if you're saying you deserve a little bit of gratitude, or appreciation, or some sort of reward, then they have a response of, "Why? You're just here. What is so special? You only got in because of X, Y, and Z."

So they are not seeing that the system itself is moving them ahead, whereas we either have to run stationary, or run on the opposite escalator, to be quite frank. I think that's more akin to being Black in America, as opposed to Black at Pioneer. In America, the escalator is moving in the opposite direction for you and you have to run on it. Where at Pioneer, it was just kind of stationary. You were just on the regular tarmac and had to run.

At the time of our interview, Victor had begun his senior year of college and was actively involved in several extracurricular activities on campus. In addition, he was in the process of applying to various medical schools for admission in the fall 2019.

### ***Eugene's Story***

*"I didn't want to feel like I was quitting on anything. Even though I wasn't academically prepared like some of the other students, I realized I was just trying to work that much harder to fill the gap."*

Eugene, 25, graduated from Pioneer in 2011. He attended CN University and graduated with a degree in biochemistry in 2015. Eugene currently works as a clinical trial assistant for a company in the Southeast. He grew up in a middle-class home in the central part of the state,

where both parents went to college and obtained master's degrees. His family nurtured his interest in STEM prior to his coming to Pioneer. In addition, he had a family connection to the school. His uncle, who is an engineer, graduated from Pioneer in 1983, the third year that the school was open. Despite his uncle's attending Pioneer and a cousin's applying to the school at the same time, Eugene was not sure if he wanted to go to Pioneer. Other than his cousin, he did not know anyone else who applied and was unsure if it made sense for him. After "taking a chance" and applying, he was admitted and was "happy" when he got accepted.

Eugene described his Pioneer experience as being very positive. Prior to Pioneer, he had attended an engineering school within a larger high school. He was one of 90 students that participated in the engineering program within a school of about 1,000 students. He shared that a majority of the students at the school were African American. As he discussed his transition to Pioneer, Eugene noted that an additional benefit was the opportunity to be around different types of people. He described the impact of his participation in a summer leadership program at the school prior to his junior year:

[Being at Pioneer] was a little bit of a culture shock at first. Luckily, there was a summer leadership program that started the summer before my junior year and it was great. I didn't know it would be as helpful as it was. I met my roommate at the leadership program, and we clicked right away. It was just a nice way to meet everyone that you'd be going to classes with in the future. Once school actually started up, we had resources and we had each other.

Eugene came to Pioneer with the thought that he would eventually major in electrical engineering in college. However, his "fortune" changed as he took more chemistry courses at Pioneer. Though he initially focused on engineering, his academic advisor at Pioneer was a

chemistry instructor, and Eugene shared that he “fell in love” with chemistry after taking one of his advisor’s courses:

My interest in chemistry that I discovered when I was [at Pioneer], it couldn’t have hit me more in my blind spot. I really did not expect it at all. I was thinking it was one of the craziest fortunes ever. It really just changed my entire trajectory.

Eugene shared that he had good relationships not only with his academic advisor but also with other faculty. He described the impact his teachers had on his experience at Pioneer:

I think that their teaching styles and their acceptability [*sic*] helped me. It nurtured my curiosity and helped me to be open to talking to people. To provide people with knowledge and expertise and not be intimidated by it. It helped my confidence and helped me see learning as an opportunity.

Eugene identified his greatest accomplishment at Pioneer as being able to stretch himself academically during his senior year, when he enrolled in advanced elective science courses, which sparked his interest in biochemistry as a college major. He also described Pioneer as a place where he “came out of his shell.” At his previous high school, he had limited social interactions with his peers outside of school. His experiences living with other students at Pioneer helped him become more comfortable interacting with fellow students throughout his college career.

Eugene shared that the African American community was “tight” at Pioneer despite its relatively small population at the school. He indicated that he knew everyone’s name, birthday, and interests. He knew that if he was struggling with anything, he could talk to his peers within the African American community at the school. He was able to talk with them when his

confidence was low and “get the boost” that he needed. At the time of his interview, Eugene was working as a clinical trial researcher for a company in the Southeast.

### ***Sean’s Story***

*“I’m an African American male in a field [where] a lot of people don’t look like me. So, I just didn’t shy away from that challenge while I was there. I took it head-on and made sure that I built my network around that.”*

Sean, 28, graduated from Pioneer in 2007. He then graduated from CNSU, a public four-year, state university in 2011. He majored in chemical engineering and now works in the health care industry in the Midwest. Born in New York, the youngest of four children, Sean moved to the Southeast with some of his family when he was a child. Although some of the study participants learned about Pioneer at an early age, Sean discovered Pioneer relatively late, during his 10th grade year when one of his guidance counselors encouraged him to apply. Initially, his mother didn’t really want him to go to Pioneer, but she later recognized that it would be a great change for Sean and encouraged him to apply and ultimately attend.

While at Pioneer, Sean was involved in many activities. He played basketball, ran track, sang in a gospel choir, and joined the National Society of Black Engineers (NSBE). He shared that it was good to be active on campus, which helped him have a well-rounded experience at Pioneer. Sean described his involvement with NSBE as one of his greatest accomplishments while at the school. He played a major role in increasing student involvement and programming and expanded the group’s representation in the local community. During his senior year, the group started participating in regional and national conferences. He enjoyed the additional exposure for him and the other students involved.

Sean described his attendance at Pioneer as an eye-opening experience where he grew and matured at a rate that he would not have been able to at home. He shared that his greatest challenge at Pioneer was getting through “really good college prep classes.” He also shared that he benefited from a strong network of Black students that “rose to the academic challenge” at the school. In addition, he described having great relationships with faculty at Pioneer:

I had great professors who wasn't [*sic*] just there to teach. They really wanted me to show and demonstrate that I had learned something. There were some teachers that I connected with more than others, which is normal, but the faculty were supportive and open to questions. They had frequent office hours, and they would give you extra attention if needed. You could tell that they wanted to be there and they enjoyed teaching.

In speaking about his experience, Sean described how being one of a small number of African American male students at Pioneer helped prepare him for life in general:

It was very common to be in spaces without any other African American males around. That was different for me, in the beginning, just being able to get comfortable with being the only Black guy in most settings. I linked into the network of African American students on campus (...) just from the common personalities and things that we enjoy or like to do. I would say it's different and it takes some time to get used to. It was an overall good transition and a good experience. I also think it prepared me for the real world, college, and now with my company. Just being comfortable with who you are and being comfortable with being uncomfortable, as far as being the only one that looks like you in certain settings.

Attending Pioneer impacted several aspects of Sean's college experience. He believed that it prepared him for the academic challenges at CNSU, specifically his courses during his freshman year. He identified the academic preparation, time management and prioritization, and residential living experience at Pioneer as helping his transition to college. He also noted that he was better prepared for the social aspects of college because of his experience at Pioneer.

### ***Michael's Story***

*"There is a lot of confidence that comes from admission and attending Pioneer."*

Michael, 21, graduated from Pioneer in 2015. He is a senior at NB College, a private Ivy League school in the Northeast. At NB, he is majoring in economics and quantitative social science. Michael grew up in an upper-class home in the central part of the state. Both of Michael's parents had professional or terminal degrees and encouraged him to pursue a career in STEM. They emphasized that "science is hard and people who do science are smart." He shared that his parents really wanted him to become a doctor.

Unlike most of the participants, Michael attended a private school prior to coming to Pioneer. He credited the private high school for helping him with his academic preparation and transition to Pioneer. Michael shared that attending Pioneer "changed his overall high school experience" for the better. In addition to the educational opportunities, he emphasized the importance of Pioneer's opportunities outside the classroom as beneficial. He participated in varsity sports such as track and baseball and acknowledged that he likely would not have been able to make those teams at his previous school. He also served as a residence life assistant (RLA) as a senior. In addition, he was a leader in several student organizations, such as NSBE, and founded a club of fans that supported the women's volleyball team.

Michael developed many close friendships while at Pioneer and had friends with demographics that differed from those of the friends he had had at his home high school. Michael specifically mentioned that he was able to find a peer group within the African American community, something that was lacking before:

At my old high school, I was really removed socially. I had a very small group of friends, and we didn't eat lunch with the rest of the campus. We didn't engage in many nonacademic extracurriculars. We only hung out with each other after school. I feel like when I came to Pioneer, I found a lot of people who I really connected with in a lot of different situations.

I made friends at the school prior to coming by doing the summer research program. And then once I got to campus, I found some students who I totally looked up to. I didn't really have that at my old school. At that school, a lot of the older kids isolated themselves. At Pioneer, there were a lot of Black men and just generally Black students who were interested in academics. I found myself with a friend group that looked more like me as opposed to earlier in high school, [when] my friend group was mostly made of White students.

Michael had mostly positive relationships with faculty. Specifically, Michael highlighted the "guidance" that he received from a faculty member who worked with him during a research and biology program. The program allowed Michael the opportunity to "gain confidence" and work independently on a significant research project. Through his participation in the program, Michael realized that he could have the "autonomy, creativity, and the ability" to carry out his own research project. In addition to the research project, several faculty members assisted Michael with the college admissions process, including a faculty member who had attended the

college Michael chose. Michael reflected upon the encouragement provided from a variety of faculty members to apply to top-notch schools. That assistance from faculty was needed, from his perspective, because he felt that the counseling services department spent more time working with students on personal counseling needs than on college planning.

In describing what it was like to be an African American male at Pioneer, Michael shared that there were both positive and negative parts of the experience. One of the challenges that Michael faced came during his senior year, as he and his fellow African American students shared where they were headed to college. Michael discussed the challenges that he and other African American students had in balancing being proud of their accomplishments while being accused of bragging about their achievements:

I remember during my senior year at Pioneer, we had all gotten into college or our chosen colleges, and all the Black students in general took photos together at our college. There was a lot of pride in the group. There was a big push about Black excellence in an attempt to dismantle the perception that Black students ... [were] unsuccessful. A lot of members of the Black community posted about their success under the label of Black excellence. I had lots of conversations with White students after that. There was some frustration with that. They felt like a lot of students were just bragging, and that was something that was looked down upon at Pioneer. People were wondering why “are they posting it up.” For a lot of people, they posted because this is a big achievement and were proud of it.

Michael shared that one of his greatest accomplishments at Pioneer was getting a perfect score on the SAT, which helped him address perceptions of race-based college admissions:

I had taken the SAT before coming to Pioneer. I had done well. But after going to Pioneer, I saw a jump and actually received a perfect score. It was a big confidence booster. It was also comforting. During the college application process, some [students] would get agitated or angry about the process because their impression was that Black students got an unfair advantage in the college admissions process through affirmative action. I internalized that. The SAT score helped me where I can just sort of rely on the score as a counterpoint to what people believed.

In sharing what metaphor he would use to describe being an African American male student at Pioneer, Michael shared what it means to be a “Black Unicorn”:

There is a sub-alumni group of Pioneer Academy on Facebook called: Black Unicorns Are Real. I think that captures the idea that a lot of other students, and a lot of Black students, come into Pioneer thinking that there aren't many or many other academically gifted, academically directed Black students. And so coming to Pioneer, I think for a lot of people, it demonstrates that this is something that is real. But also, by the same token, I feel like as a student, you feel this pressure to show everyone else that this is the case. That there are Black students who are smart, that they are academically driven, that they can be successful. So, there is that pressure to prove that you are real. I think that all Pioneer students feel like they're a little bit of an exception or something that's rare to find. But I think to the Black student, that feels especially powerful. And you're not just trying to prove that you are exceptionally smart but [that] the entire race is also composed of exceptionally smart people and challenging people.

At the time of our interview, Michael was starting his senior year of college. After graduation, he planned to work full time at a bank where he had a chance to work during the summer while in college. After that, he shared that he would be “figuring out his next steps.”

### ***Thomas’s Story***

*“For lack of a better word, I feel like I definitely learned how to code switch at Pioneer. So like being comfortable when you are around people, but also just being comfortable just stepping out of it. All those things that became important to me and I learned that at Pioneer.”*

Thomas, 27, graduated from Pioneer in 2008. He graduated in 2012 from RU, an elite private college in the Southeast, where he majored in Biochemistry. Born in Nigeria, he came to the United States when he was ten years old. He grew up in a middle-class home in the central part of the state. Both of his parents graduated from college in Nigeria. He described his family as being pivotal for his interest in STEM fields and attending Pioneer. Thomas’s father had a background in biochemistry and worked in manufacturing. His mother had trained as an architect in Nigeria and was involved in town planning. His parents’ exposure to science and math played a significant role in Thomas’s development.

While at Pioneer, Thomas shared that he had great relationships with faculty and was able to develop one-on-one relationships with them. They helped him build his confidence:

I think [the] faculty at Pioneer definitely still had a level of nurturing, which is needed for some people. I think I was one of them. A faculty member would sit down with me and walk me through why I was missing certain things or make me retake exams. We had a relationship outside of class. Almost every faculty member I had, we had some level of one-on-one relationship.

Thomas believed that the quality of faculty mirrored what one would find on a college campus. He described the confidence he earned by simply doing advanced, college-level work at Pioneer. For example, Thomas spoke about “falling in love” with calculus at Pioneer, which smoothed his transition to college-level calculus:

It was a jump start to my freshman year, which can be a make or break year. I remember [during] my freshman year in college, a lot of people were on the pre-med track, and the classes were kicking their butts. It was helpful to have [had] that jump start with calculus. The same thing happened on the science side with chemistry. I took so many chemistry classes at Pioneer that I ended up thinking that is what I would have done as a major in college. I don't think that I would have been half as successful at RU as I was if I hadn't gone to Pioneer.

Thomas's confidence also grew outside of the classroom while at Pioneer. He served as a student ambassador in the admissions office and participated in several clubs, such as Health Occupations Students of America (HOSA) and NSBE. He shared that participating in these activities laid the foundation to have ownership of his time and experience when he went to college. Thomas went on to be actively involved in college as well. At RU, Thomas was a resident assistant. In addition, he helped create an organization that coordinated science days for the local community, similar to a program that he was involved with at Pioneer. He shared that while at Pioneer, he was able to participate in leadership roles that “forced him out of his shell.” As a result, his confidence grew and he took “ownership” of a lot of things.

Thomas acknowledged that Pioneer provided the “biggest growth spurt of his life.” A self-described “shy and nerdy kid,” he shared that “at your middle and high school, if you are in honors courses, you are in a little clique of academic people, but at Pioneer, everybody is like

that, so you have the opportunity to redefine yourself and your social circle.” He credited Pioneer with helping him branch out socially, which impacted his life:

I became [a] more social being at Pioneer, and again I think that’s translated to the rest of my life. I honestly feel like I can be in a room with anyone and not think twice about it. And I think that was partly as a result of being at Pioneer. I think my comfort with diverse populations [grew], even if it’s being the only minority in an environment. Pioneer helped grow my comfort. And also still finding my identity and being comfortable with my roots.

Thomas shared that as an African American student at Pioneer, he learned several lessons that he could still apply to his life. He shared that he learned “he could overcome any struggle or barrier that came his way.” He also found that participation in clubs such as NSBE helped him find a strong and supportive community. Currently, Thomas is a medical student at a school in the Southeast. At the time of our interview, he was completing his rotation in medical school. He will be applying for medical residency in the fall of 2019 and plans to finish medical school in 2021.

### ***Jackson’s Story***

*“When I pulled up to campus with my parents, I said, ‘Wow, there are a lot [of] White people at this school.’ My dad said, ‘I guess you have to get used to it, because that’s the way the world is.’”*

Jackson, 21, graduated from Pioneer in 2015. He is a senior at CB, a private, Ivy League college in the Northeast. At CB, he is majoring in materials science and engineering. He grew up in a middle-class home in a metropolitan area of the state. He was attracted to Pioneer for several reasons. He jokingly shared that he was excited to attend a residential high school for the

opportunity to be “away from home.” In addition, he was looking forward to taking better science and math classes than what was offered at his home high school. Jackson’s family recognized at an early age that he was good in math and science and helped him develop his interest.

Once Jackson arrived at Pioneer, he recognized that his home high school was very different. He shared that it was the first time that the teacher did not have to get students in the class to be quiet. For him, even subtle differences made him feel like he was in a “foreign” space when he first arrived at Pioneer. In addition, Jackson experienced a learning curve related to the academic rigor of the school:

I don’t ever remember doing homework at home. I always just did homework in the class before school. I didn’t even have good time management skills. I was not prepared for the level of rigor. I was not prepared for the level of depth. I took a precalculus class in my home high school, and I took it again at Pioneer and I did not do well. This is a class that I already took. I just didn’t understand.

Jackson shared that the rigor at Pioneer was unlike the rigor he faced at his old high school. After describing the classes as “tough,” he expressed his frustration with not excelling at Pioneer at first and how that affected him:

It was very stressful. I don’t think that I [had] ever been that stressed at my old high school. I don’t know if that was a product of me being a freshman and a sophomore at my old high school, and at Pioneer, taking junior and senior courses, which you would expect to be harder in general, or if it was the rigor. Pioneer was the first place where I pulled all-nighters. I don’t even pull all-nighters in college.

The stress of Pioneer was the greatest challenge that Jackson identified while at the school, which admittedly took a while to overcome:

The greatest challenge I had was just surviving the overall pressure. It was to a point where I started to realize that my ambition was coming from me; it wasn't coming from my parents. When I came back with my first trimester grades, [my parents] got the idea that this school is hard. I learned to not put so much pressure on myself. Dealing with that would be a huge challenge but I would say I did not get through the challenge until after I finished at Pioneer.

Jackson was involved in several clubs, such as the Technology Student Association (TSA) and NSBE. His participation in award-winning clubs at the state and national level was important to him:

I was very involved with clubs, and probably that is what got me into college. It was interesting because I was a very reclusive person. I decided to run for student government. I was endorsed and then I was in student senate. I was involved in the TSA, and we did well in competitions at the state level. I was a state officer for NSBE. I spent a lot of time with NSBE and I got the ability to go to actual competitions. I am glad that I got to take advantage of those opportunities while at Pioneer. At my old high school, I was a part of TSA, but we never really won anything. When I went to Pioneer, we actually won stuff. It was very encouraging.

Jackson participated in a summer program at a prestigious Northeastern college prior to his senior year at Pioneer, which he learned about from a faculty member at Pioneer. He believed that his completion of that program significantly influenced his acceptance into CB the following year. In addition, Jackson explained how Pioneer helped him prepare for college:

I chose my major because I liked chemistry a lot in high school, and I was able to explore than in depth at Pioneer. It influenced the major that I chose. In addition to that, culturally, Pioneer was part of me getting used to going to a primarily White institution. It helped push my confidence. It helped me transition into understanding levels, it was a stepping stone that I came into college with. If I didn't go there, I would have been torn apart at CB.

Jackson candidly shared the stress and pressure that he faced while a student at Pioneer and in college. Towards the end of our conversation, he admitted that if he had to do it all over again, he was not sure if he would make the same decision to attend Pioneer:

I honestly don't know if I would have done it again. I think it was a great opportunity in terms of being exposed to a level of education that there was no way I was going to get at my old high school. But it comes at a cost.

At the time of interview, Jackson was starting his senior year of college and applying to medical school.

### ***Taylor's Story***

*“One of my favorite proverbs is, “More is sown in the garden than the garden knows is being sown.” At Pioneer, especially for African American males, ... there is a lot of pressure on us to do well, not only by our families, but also from society, to not necessarily be a stereotype. A lot of African American males at Pioneer have done amazing things. Some of those habits that we built in college and some of the things that we are accomplishing now can be owed back to Pioneer. Even though at the time, we didn't realize that Pioneer [was] really instilling into us all these skills and knowledge that we are now using in our careers.”*

Taylor, 21, graduated from Pioneer in 2014. He graduated from CNSU in 2018 with a degree in biological sciences (molecular, cellular, and developmental biology concentration). He grew up in a middle-class, two-parent household in the northeastern part of the state. His mother had graduated from college and was a tax assessor, whereas his father had graduated from high school and was a highway patrol officer. His family was very supportive of his interest in education, specifically in math and science. They made sure that distance, time, and cost did not impact his exposure to various STEM programs when he was growing up.

Taylor shared that educational opportunities in his home community were limited, so accessing them often required extra steps. One such extra step led to his exposure to Pioneer while in middle school. He participated in a summer STEM program which emphasized “going beyond the status quo.” He shared that the program helped him identify what courses he needed to take to be a serious candidate for admission at Pioneer. Taylor participated in the program for four consecutive summers, where he took short courses and stayed in the residence halls for up to two weeks each year. He credited the program with building his confidence and cementing his desire to apply to and ultimately attend Pioneer.

At Taylor’s home high school, the highest math class offered was precalculus; the highest science class was chemistry. Pioneer therefore provided opportunities beyond what his home high school was able to offer. Despite having participated in the Labs for Learning Program, Taylor described the “rough” transition that he had once he was a junior at Pioneer:

Being the from rural, Northeastern part of the state, where the expectations were just passing the state test and just doing better than your peers, and then going to Pioneer, and I’m next to students whose parents have PhDs in so many different fields, and they know

more than I do. Some of them [were] in AP calculus their junior year, or some were even in higher math courses, or in AP biology [or] chemistry. So I felt like I was constantly competing with some of the other students. I don't know why I had that initial feeling during my first trimester, but I did not do well the first trimester at Pioneer. I got a C or two. One of the things that I realized is that I needed to ask for more help more often. So, academically, it was a struggle.

It was through these early struggles that Taylor recognized that he would need additional support to be successful at Pioneer. He realized that he needed to ask for help, something that he did not do at his previous school. By taking advantage of office hours and tutorial sessions offered by faculty, he was able to adjust to the academic rigor of Pioneer during the middle part of his junior year.

Taylor grew accustomed to being away from home through the summer program. Although the academic transition was rough, he grew as a person at Pioneer. He was involved in several clubs and activities, including NSBE and dance ensemble, and served as an RLA. He immersed himself in cultural festivals, including helping to plan Latin America Fest as a senior. He credited his cocurricular experiences for his growth and maturity:

That's something that I really wanted: that challenge to grow and build relationships with people and be the best person that I could be. And I feel like at Pioneer, it really helped catalyze that transition for me from just being a teenager to an actual young adult.

Taylor described positive relationships and experiences with the faculty at Pioneer. In particular, he remembered one faculty member who invested in his long-term growth. As a junior, Taylor applied for the mentorship program but did not get accepted. Although initially disappointed, he was able to still do research via an independent study at a local college with the

help of an African American faculty member. He shared that the research opportunity helped him develop his career interest:

She [the faculty member] was instrumental in helping me find out that research was something that I actually liked and [in helping me develop] some of the skills that you need to learn in a research lab. She was very instrumental in making sure that I had this experience. After the opportunity, I knew that I wanted to be a biomedical researcher. She and the [other] faculty were really encouraging. You can do whatever you put your mind to. She really embodied that.

In addition to good relationships with faculty, Taylor had good relationships with his student life instructor (SLI), guidance counselor, and the admissions staff. He described having weird roommate situations in both his junior and senior years. During his junior year, for example, his roommate left the school after spray painting a racial slur on the building. When asked about how that impacted his experience, he shared that adults on campus made sure that he was not in any type of distress and talked to him about the situation.

Taylor described that the African American community as “tight knit.” He shared that “people looked out” for him, and he still maintains close relationships with his peers. Even though the community was close, Taylor acknowledged the challenge of often being the only African American male in one of his math or science classes and how he dealt with that:

I remember I was in a group, and it seemed like nobody in my group really wanted to talk to me, or ask me for help, or even get my opinion on things. I don’t know if was because of my race or because I was a junior, but it seemed like they weren’t asking for my feedback on a group assignment. That was the only time at Pioneer where I felt like I really questioned my position at the school because of my race. But other than that, I

remember at the time it seemed like a lot of the Black faculty and administrators that were there were very supportive, so they made the navigating part not as monstrous as it could be at a predominantly White institution. I know some people would go off to Ivy League schools, and there is a big hurdle that they have to overcome with trying to get their voices heard on campus. I never felt I had that issue at Pioneer.

Taylor received a prestigious scholarship that covered the entire cost of attending CNSU. He shared that he “never could imagine getting it” and that the scholarship demonstrated that two years of hard work at Pioneer paid off. At the time of the interview, he was starting his second year of medical school at a school in the Northeast.

### ***Keith’s Story***

*“My wife thinks I am crazy because I say I always liked school. That was from Pioneer. I just enjoyed the challenge.”*

Keith, 29, graduated from Pioneer in 2007. In 2011, he graduated from CN, where he majored in chemistry. After graduating from CN, he went on to graduate school and completed his doctorate in pharmacy from a school in the Southeast. Currently, he is a pharmacist working in a hospital in Southeast. He grew up in a middle-class, two-parent home in a metropolitan area of the state. His mother had graduated from college and his father had graduated from high school. Despite his mother’s not wanting him to be “away from home,” his family was supportive of his applying to and attending Pioneer. His extended family was also supportive of his going to Pioneer. In particular, his aunt, who worked at a hospital, encouraged his educational pursuits. Some of her colleagues knew about Pioneer and spoke highly of the school. She was especially influential in Keith’s decision to apply to and attend Pioneer.

Prior to enrolling at Pioneer, Keith attended a high school that had an academy within the school that directed students toward studying health care and engineering. From Keith's perspective, the larger high school focused on certain aspects of school life, such as athletics, but did not highlight the importance of education, which helped build his interest in attending Pioneer. He examined the curriculum and found that Pioneer offered an array of science and math classes not available at his home high school. He noticed that courses in the humanities were just as diverse, and said that "the idea of going to a school that was kind of all about academic rigor really stuck out to me. I thought this would be a good fit for me."

At Pioneer, Keith was involved in a number of clubs and cocurricular activities, such as NBSE, the gospel choir, tennis, and swimming. He shared that his Pioneer experience was the "best two years of his life," but he acknowledged that not everyone who attended Pioneer likely shared that feeling. As he described his experience, Keith recognized early that he was going to have to work hard:

I think [Pioneer] was probably the place where I first started to see ... disparities that I felt were based on things like race or background. I understood that dynamic and learned to not let that deter me from succeeding. I feel like that was my biggest challenge [in] overcoming that, and making friends, getting involved in activities, and realizing that the opportunities to break down some of those disparities, and still graduate [and] get into college. I might have to work a little harder, or go a different route, but knowing I could still get there was important.

Keith shared that the faculty and staff at Pioneer were supportive. They helped him focus on the big picture without getting distracted. He relied heavily on these individuals and shared that he still maintains relationships with them to this day. He shared that "they still make sure

that he is on point.” In addition, he talked about the importance of taking advantage of all of the opportunities at Pioneer. He recalled being in an auditorium and video chatting with astronauts as an amazing experience:

During my junior year, we had a live video chat with astronauts that were in space, and I just remember thinking that was a cool experience. People took it seriously. I would have never had a chance to do this at my old high school.

Keith shared that his greatest accomplishment at Pioneer was getting into all four colleges that he applied to and receiving a scholarship that covered the full cost. He said: “I felt very accomplished to have gotten through the rigorous program and get accepted everywhere I applied.” The experience at Pioneer made his transition to both college and pharmacy school more manageable. When asked what symbol he would use to describe his experience at Pioneer, Keith chose a unicorn. He associated the unicorn with his experience not only at Pioneer but also as one of very few Black male pharmacists:

We do exist! Even with some of my colleagues now, in the field of pharmacy, there [are] not a lot of Black male pharmacists. I work with two other African American males at the hospital, and we joke about the fact that if we looked at studies, our hospital probably has the highest number of Black male pharmacists in the nation. I remember in pharmacy class, there were maybe one or two [Black males] in my class. At every other hospital, I have never worked with any. And so, I always say, “Yeah, we do exist.”

### ***Larry's Story***

*“The way I studied in school before, I just had to completely abandon that. I learned that after the first trimester. It was like nothing that I learned in school in the ninth and tenth grade or*

*before that would apply to what I am doing now. So, I basically had to just scrap all that and come up with something new.”*

Larry, 21, graduated from Pioneer in 2015. He is currently a senior majoring in neuroscience at VU, an Ivy League college in the Northeast. He grew up in a single-parent, lower-class home in a metropolitan area of the state. His mother had attended some college but did not receive a bachelor’s degree. Growing up, he loved learning and loved math and science. At his home high school, no one was really familiar with Pioneer. However, he had an older cousin who graduated from Pioneer, and she encouraged him to apply. He was interested in Pioneer because he was motivated to “learn something on a different level” and see how he would react.

Larry shared that he had an amazing experience at Pioneer. He said that participating in a summer bridge program prior to his junior year was extremely beneficial because it helped him get to know the people he was going to be around for the next two years. In addition, he shared that the faculty that helped with the program created a warm and welcoming environment where they spoke with him about life and career goals.

The academic, residential, and extracurricular experience were all things that Larry described as amazing and unique. However, they did not come without challenges. Larry, who was the top student at his school before coming to Pioneer, described his realization that he was no longer at the top of his class:

You get frustrated because the grades are not what you want them to be, but you have to understand that you’re in a whole different place.... It was very discouraging at first, but over time, with the support of faculty, roommates, [and] hall directors, I was able to get through it.

Larry shared that he had positive relationships with a lot of adults on campus. Specifically, he credited the strong relationships that he had with admissions office staff, who provided support and advice during his entire time at Pioneer. He said: “They were willing to speak with me about anything. I would spend a lot of time there during my time at Pioneer.” In addition to the support that Larry received from admissions staff, he benefited from the school’s residential living environment:

Before you even come to college, [residential living] really provides you with those skills of how to interact with people, how to pretty much live with somebody, and also how to leverage the people on your hall in case you have trouble with something. So everyone was supportive. Everyone came to the hall I lived on with different strengths and weaknesses, but when we’re all together and stuff, we pretty much sort of compensate; if somebody lacks something, some area, somebody is always there to help in any way possible. It’s really like that experience, but also really living in a community is something that came from the residential experience.

Larry shared that being an African American male at Pioneer was challenging. For example, he shared that, initially, not all of his African American peers were fully prepared and equipped to excel in academics at Pioneer:

It is definitely a challenge. Based on my experience going through Pioneer, the people who were in my class, not everyone came from a background where they had tools and advantages to do well academically initially in Pioneer, so it really was a challenge.

Obviously, as an African American, going to Pioneer and seeing the other African Americans there helps. There is a strong community [...] which you can be in. Overall, it was a challenging experience, but it really is what you make of it. I think if you really

go into it with an open mind and really seek out people to talk to and be willing to reach out and also get to know other people, even if they are not of your ethnicity, I think that's important.

Larry shared that his greatest accomplishment was simply graduating from Pioneer. His Pioneer experience impacted his academic and social adjustments to college. He believed that the academic rigor and living in the residence hall allowed him to "transition smoothly" into his freshman year and establish a foundation for success in college. At the time of our interview, Larry was starting his senior year in college. After graduation, he planned to work as a consultant for two years in Boston before entering medical school.

### ***Eric's Story***

*"They really pushed me the extra mile and gave me the incentive to perform because they knew what I was interested in. I think they could have easily written me off but they said, 'Okay, you want to study engineering, then you need to know this more than everybody else.'"*

Eric, 29, graduated from Pioneer in 2007. He then graduated with a degree in civil engineering in 2011 from TCAN, a historically Black college in the Southeast. He also received an MBA from a school in the Midwest. He grew up in a middle-class household in the Northeastern part of the state. He chose to attend Pioneer to enhance his educational opportunities. He felt like he did not come from a good high school and that he needed to find a place to help him reach his aspirations. He decided to apply and his parents "signed off" for him to attend.

Eric's mother encouraged his interest in education and in STEM. An educator, his mother was supportive of his aspirations as an engineer because of the "ingenuity and innovation" that she witnessed through his interest in science and math courses. Two of Eric's

older cousins and a family friend had attended Pioneer before he enrolled. He visited them on campus many times and saw how Pioneer benefited them after coming from the same rural part of the state.

At Pioneer, he participated in a number of activities, such as NSBE and the gospel choir, worked with the development and admissions offices, and played varsity track and basketball. He described his experience as “challenging, enjoyable, and enriching.” It was the first time that he was in a space where he was not known for his parents or family. Eric discussed his transition from a rural environment to Pioneer:

While it was enriching, it was also rigorous, and while I enjoyed it, it was also challenging. Coming from a small town, you know, an upper-class, middle-class family, sometimes you just don't know what you don't know because in my world, I never hurt or lacked for anything, but everything is relative. So, upper-middle class in the rural part of America is very different from upper-middle class in San Francisco. So for me it was an opportunity while still in high school to learn that the world is much bigger and this stuff is relative because in my hometown, I was not only upper-middle class, but I was also the smartest kid in the classroom, and neither one of those were the case when I got [to] Pioneer. So, that was eye opening in a very positive way. It was incredibly rigorous, [but] again, I signed up for that because that's what I wanted to include [in] my educational plight.

His Pioneer experience reinforced his interest in engineering as a major in college. He shared that he wasn't certain that he would have made the same decision if he had never left home:

The rigor cemented the fact that I wanted to do engineering as a further field of study. If I had just stayed in my hometown, I am sure I would have passed all of my courses and I would have just said, okay, I want to be an engineer. However, I don't know that I would have stayed on that path because I may not have been severely challenged or experienced. Whereas [upon] leaving Pioneer, I went into college feeling very prepared and excited about the opportunity to go after what I had dreamed of becoming. The opportunities that were at Pioneer helped me dream of what I could become. I had never heard of NSBE before going to Pioneer, but I fell in love with NSBE. That was another thing that cemented me to become an engineer.

Eric had positive relationships with faculty at Pioneer. He explained that they helped him create “good habits” that benefited him in college. For example, he began the habit of meeting with teachers during their office hours at Pioneer. Noting that not every high school offers faculty office hours, he acknowledged how important it was to meet with his instructors and seek additional support:

To be able to go to ask questions after hours and get additional support, it not only supported me and helped me academically but it also created good habits for when I got to college, because Lord knows that there were many days when I needed to go to office hours in college being an engineering major.

When asked to share a metaphor to describe his experience at Pioneer as an African American male student, Eric shared that he and his peers were black sheep in an open pasture. He went on to explain:

In a flock full of other sheep, we were all there for the same reason, we all went through the admissions process, but nonetheless, when we got there, we still had to work twice as

hard and we were still the minority in many ways. But, nonetheless, once we were groomed and developed at Pioneer, we went on to do great things. So, the reason why I use the sheep analogy is because that wool: the black wool, is just as useful as the other wool from the other sheep in the field.

At the time of our interview, Eric was working for a major financial company on the West Coast as a management consultant. He maintains good relationships with many people that supported him at Pioneer and speaks to them on a regular basis.

### ***Aaron's Story***

*“I definitely think just being Black, people think a certain thing. Especially in the advanced academic spaces, people don't really think that you're ready or good enough. I would usually just get over that and be like, okay, well, if they feel like I'm not good enough, well, then I guess they're gonna have to be alright with just being wrong.”*

Aaron, 20, graduated from Pioneer in 2015. He is a senior at TU, an Ivy League college in the Northeast. At TU, he is majoring in computer science, rationality, and thought. He grew up in a middle-class household where both his mother and father had graduated from college. He was born in Nigeria and had immigrated to the United States with his parents, who valued education, especially STEM education. Aaron joked that “philosophy courses were not an option for him” and that his parents focused a lot on STEM-related career paths. He switched schools several times during elementary and middle school because his parents felt like they were not challenging enough for him. Once he was in high school, he started running out of computer science classes he could take. He then heard about Pioneer and the number of computer science classes he could take after AP computer science. He decided to apply to the school after “falling in love with the course catalog.”

Aaron participated in a Pioneer summer experience, which built his academic and social confidence, prior to enrolling as a junior. While at Pioneer, he participated in NSBE; state, regional, and international math competitions; served as a computer science teaching assistant; served on the TSA at the state level; and participated in a research program. These experiences developed the confidence that he needed to compete with his peers at Pioneer and at other schools.

Aaron recalled his placement in a lower-level math class that he thought he should have placed out of. He ultimately enrolled in precalculus and calculus simultaneously for several months before being allowed to switch into calculus later in the school year. He was frustrated because he felt like he was not initially placed into the correct math course. However, he shared that as a result of this, he established a stronger math foundation that served him well as he represented Pioneer in international math competitions. He felt like his math instructors at Pioneer were better teachers and cared for him more than his instructors at his college.

Aaron excelled academically at Pioneer and was accepted into several top colleges. Though he had a sense of pride in his academic achievements, he shared that the college admissions period was “a very trying time for Black students at Pioneer.” He recalled being confronted by non-African American students who were frustrated that they were not getting into their top choice of colleges:

Even if you do well, everyone is going to think, you got in because you are Black. You hear the coded message, that you got into Pioneer because you are Black. I remember getting into an engineering college and one of my White hallmates sharing, “I wish I could have got a scholarship to go to there, but I am not Black.” I then shared that it was a merit scholarship, and the student apologiz[ed]. It was a feeling like I am doing well

and I am getting into a few of these elite and Ivy League schools, and I am pretty sure that these people just think that I got in because I am Black.

At the time of our interview, Aaron was a senior at TU. He was in the process of applying to graduate schools where he would focus on computer science. He planned to begin graduate school in fall 2019.

### ***Darren's Story***

*“Where I’m from, academics aren’t taken seriously. You’ve probably heard this before, but it is not cool to be smart. Being smart wasn’t something you really wore on your sleeve.”*

Darren, 25, graduated from Pioneer in 2010. He attended WG for one year and then transferred to CN. In 2015, he graduated from CN, where he double majored in political science and Psychology. In 2018, he graduated from law school in the Midwest. He grew up in a lower-class household in the Northeastern part of the state. He shared that his parents did not accept mediocrity when it came to education. They explained that “the world is yours and you can do whatever you want and we are here to support you, whatever choice that is.” His older brother also attended and graduated from Pioneer. Darren said that he knew Pioneer would open doors for him after seeing his brother attend the school.

Darren referred to his time at Pioneer as the “two most impactful years of his life.” He openly discussed his initial struggles in the classroom:

Some of the failures helped me build academic confidence. In times where I did not take things serious[ly] at Pioneer, I failed. I definitely had my share. Those failures let me know that I have to take this serious[ly]. I have to approach this with some sort of curiosity or I will not be successful. When you miss the mark, you learn what you need

to do. I learned to put my best foot forward. The tougher times put that confidence in, oddly enough.

Darren shared that although he did not feel alienated because of his race, there were moments where he felt like he was treated differently. He said that there were times that comments from peers made him realize that he was in a “different ball game.” He shared that he learned how to defend himself and “build some tough skin” while at Pioneer. Darren described the significance of being an African American student at Pioneer:

You realize being Black in an environment like that means something. Your presence means something. Probably more than it should. You are not like a representative of some sort, but you really are representing something bigger than yourself being there. That pressure can be a bit much sometimes. You are kind of wearing your family, your whole town on your back, and they want you to do well and they want you to be successful there, despite the ups and downs of being Black.

When asked for a metaphor he would use to describe being an African American male student at Pioneer, Darren shared that is like keeping a sword sharp:

Being Black and at a place like Pioneer, it's opportunities all around us. It is up to you to take advantage of it. If you don't, you can dull your experience and yourself. You are in a place where it is sort of like an iron-sharpened steel type of thing. So, you sharpen your weapon and prepare yourself for the battles moving forward. It is your duty as a student, but not only as a student, but as a Black student, a Black male in college, a Black male in the workforce, [and] as a Black male in America.

Darren discussed how things “started to finally click” for him toward the end of his senior year. His grades improved and he earned As and Bs in his final trimester at Pioneer. He

enrolled at WG and shared that he was able to “kick butt and take names” there because he felt academically and socially prepared. He ended up transferring to CN after one year at WG. At the time of the interview, Darren was preparing for a career in public policy.

## CHAPTER FIVE: FINDINGS

The purpose of this study was to explore the experiences of African American male alumni who graduated from a residential state math and science school. This qualitative study focused on identifying the transition process involved with attending Pioneer Academy. The following research question guided this study: What are the storied background, academic, and social experiences of African American males who transitioned into and graduated from Pioneer?

Two theoretical frameworks grounded this study: Harper's anti-deficit achievement framework and Schlossberg's transition theory. The anti-deficit achievement framework inverted questions commonly asked about educational disadvantage, underrepresentation, insufficient preparation, academic underperformance, disengagement, and Black male student attrition (Harper, 2012). Harper's framework shaped the questions that help people understand how African American males successfully navigate to and through higher education and, ultimately, postcollegiate options. Schlossberg's transition theory grounded this study through (a) the motivation and support to attend Pioneer, (b) the transition to Pioneer, and (c) the transition through Pioneer and beyond. The theoretical frameworks guided interview question development, data analysis, and organization of identified themes.

In Chapter 4, I provided relevant demographic education information and a profile for each participant (Tables 4.1 & 4.2). In Chapter 5, I dive deeper into the four themes that emerged from the study. The themes capture how participants made meaning of their experiences as African American male graduates from a state residential math and science school. These themes, along with several subthemes, emerged during data analysis from the interviews of 12 African American male graduates of Pioneer: (a) family influence, (b) seeking

out greater academic opportunities, (c) adjusting to a residential math and science high school, and (d) achieving success at a residential math and science high school.

**Table 5.1: Themes and Subthemes**

<b>Research Question</b>	
What are the storied background, academic, and social experiences of African American males who transitioned into and graduated from Pioneer Academy?	
<b>Theme</b>	<b>Subtheme</b>
1) Family influence	a) Positive support and encouragement
	b) Family role models
2) Seeking out greater academic opportunities	a) Interest in and exposure to STEM
	b) Limited opportunities at home high school
3) Adjusting to a residential math and science school	a) Adjustment to increased academic rigor
	b) Adjustment to PWI
4) Achieving success at a residential math and science School	a) Support from high-quality faculty and staff
	b) Supportive African American peer community
	c) Meaningful leadership and participation in cocurricular activities
	d) Increased academic and social Confidence

**Family Influence: “They didn’t accept mediocre when it came to education.”**

Family support was a common theme for participants. Their reflections revealed that they benefited from a supportive family and that this support positively impacted their decision to apply to and attend Pioneer. As the participants reflected on their experiences, they shared examples of family members who served as supporters, cheerleaders, motivators, and positive examples for their educational and career pursuits. Participants shared stories of their family’s encouraging their interest in STEM education at an early age, and supporting their leaving home to attend a residential high school. Participants discussed the expectations and support that they

received from parents, older siblings, and extended family members. Two subthemes emerged from these reflections: positive support and encouragement and family role models.

***Positive Support and Encouragement:*** Participants reflected on their experiences prior to attending Pioneer. They openly discussed the positive support and encouragement they received from their family. For example, during his interview, Victor recalled a conversation from elementary school when his mother met with one of his teachers:

My mom told me that she started to see that I was doing well and excelling all of the time. She was the first person that recognized that there needed to be a change. I remember her telling [that to] my fourth grade teacher, who was the first Black woman that I had as a teacher. She said that the teacher went and told her toward the end of the year that I was too smart to simply be at that school and that I needed to be at a school with an AIG program, and that I needed to be pulled out of that school and go somewhere where those kinds of programs are available.

Like Victor, other participants emphasized the importance of their parents' recognition of their academic achievements and potential. Jackson, who graduated from Pioneer in 2015, described how his parents encouraged his interest in math and science at an early age:

My parents noticed that I was good at science and math and definitely helped me along the way to pursue my interest. My dad works at a bank and my mom is an interpreter. Neither one of them had STEM careers. It was more of, "I like the subjects that make you a good candidate to be an engineer, or have a science career." They saw that and they wanted to help me along the way. They emphasized education a lot so I think they really wanted me to pursue the best educational experience I could [find]. So, I was very

much in a place where my parents valued education so they wanted to further my interest as much as they could through educational experiences.

Like Jackson, Taylor's parents did not have a background in STEM education. Like Jackson and Victor, Taylor's parents recognized his ability and made efforts to support him through various cocurricular educational opportunities:

My parents have always been very supportive of me no matter what, and it goes for my sister as well. They have always been supportive, making sure that we go to college and we do the best that we can for ourselves. They have always wanted better for us than they had when they were growing up. My parents said, "As long as you are doing well in school and you are constantly working toward your goal, that is what we want from you." Neither of my parents are scientists. Whenever opportunities came about, like attending Pioneer, they always made sure that I wanted to do it and that I was putting my best foot forward. They always made sure that transportation or money was not an issue. They always helped in whatever way they could. And they would do whatever they could to make sure that I had the opportunity to do these things, especially because where I am from, there is not a lot of opportunity. They wanted to make sure that where I live doesn't necessarily hold me back from my true potential.

Both Eric and Sean shared similar stories of support for their education from their mothers. Eric shared:

[With] my mother being an educator, [she] observed my aptitude in STEM fields in comparison to the arts or humanities spaces. So, I do think that she was very supportive of the idea of me going to Pioneer and me becoming an engineer because of the ingenuity

and innovation that she had seen come for me by the way of an absolute interest in science and mathematics courses.

Like Eric, Sean shared a similar story of support from his mother: “My biggest influence and personal encourager was my mom.” In his interview, Sean described how his family moved to the Southeast from New York when he was a child. Throughout that time, his mother and aunt supported his educational pursuits and encouraged him to apply to Pioneer:

I am the youngest of four kids. When we moved down to the Southeast from New York, I was kind of independent [as] a kid, just kind of doing my own thing and just making my own way. But you know, when I wanted to go to school [Pioneer] and I looked at it, and I [thought] it would be great. I really didn’t have any personal strong desires to stay at home. I really wanted to do it myself. My mom didn’t want me to go necessarily. But she knew it would be a great change for me and she really encouraged me to apply. In addition to my mom, my aunt from New York encouraged me. [My aunt said,] “Take this opportunity even though it is a little different and not the normal path. It will open up a lot of things for you.”

Like Sean, Keith’s mother initially was not in love with the idea of his leaving home early. Keith’s sister was a sophomore in college when he considered applying to Pioneer. Describing himself as his “mom’s baby,” she “warmed up” to the idea of his attending Pioneer once she realized that students came home once every four to five weeks for an extended weekend and once she became familiar with the reputation of the school. Keith shared:

My sister and I are about four years apart exactly, so when my sister had gone off to college, I was just pretty much starting high school. So, my mom thought that I would be in the house for four more years. So, when I talked about doing this, that was two years

early that she was going to be kind of losing both of her kids away from the house. So, it was kind of an adjustment. She saw how important it was to me and then she saw the reputation of the school. After that, she never said anything to deter me. She was like, “Of course, you know I will miss you.” I think once she saw that there were weekends when you came home and knowing that it was not that far from home and knowing that she was still going to get to see me pretty often, it was never really an issue. My mom and my dad were supportive.

Participants in this study recognized the importance of positive support that they received from their family in the pursuit of their educational pursuits.

***Family Role Models:*** Participants shared stories that illustrated the importance of having parents, older siblings, and other family members who served as positive role models for them. Several participants discussed the emphasis their parents placed on the importance of STEM education and careers. For example, during his interview, Michael described how his parents’ encouragement was a primary motivator for him:

They really wanted me to be a doctor. That was something that was on my mind. But they also stressed academic achievement. They shared that science is hard and people who do well in science are smart. Combined with the values that they had been teaching me, STEM was something that was appealing to me.

Two participants, Thomas and Aaron, were immigrants to the United States. Both were born in Nigeria and emigrated when they were in elementary school. They shared similar stories of how their parents placed an emphasis on STEM education and STEM careers. Thomas talked about the importance of his parents’ STEM background:

I think it has been pretty pivotal. My dad, back in Nigeria, was in STEM. He had worked in the industry and in manufacturing. His background was in biochemistry. He had gone to school for biochemistry and then got his master's degree. I guess from early on, it had always been a part of our lives. I remember going to their factories when I was younger. I guess being surrounded by that and hearing chemical terms and chemistry things at home, like the mundane things, got me started. My mom in Nigeria was in town planning, but she was trained as an architect. There was some of the elements of science in that as well. I think education as a whole was big. After we moved to the States, being immigrants, education [played] a big part and I think we just gravitated towards science and math.

For Thomas, his parents' role in STEM industries influenced his desire to explore STEM-based education. Aaron also discussed how being an immigrant to the United States impacted his family's career path and influenced him:

I am an immigrant. I was born in Nigeria and both of my parents were also born in Nigeria. Most of my family is still in Nigeria. So, it is very much an immigrant family. My dad worked as an IT consultant and he was kind of trained to work in the IT industry in consulting and he did his own freelance work. My mom was a nurse. With both of them being in STEM fields, they definitely pushed us in that direction. I know it is said jokingly that Nigerian children can only be doctors, engineers, or lawyers. I guess being like my dad and doing some type of computer thing was important. I wanted to make things with computer science at an early age and they [my parents] definitely supported that.

For Victor and Larry, their mothers played an integral part in their interest in STEM fields. Both were able to see their mothers pursuing and working in STEM fields. They both shared how their mothers' STEM careers sparked their interest in STEM education. In addition, they talked about the support that they received from their mothers. Victor shared that he would occasionally ride the train to the hospital and watch his mother work:

My mom was pretty embedded in the field of medicine. Growing up, I would visit my mom at work or had to go with her for some reason. She worked in the hospital and it was kind of cool to ride the train to the hospital. In addition, to be on the medical intensive care unit and seeing all the doctors and nurses was cool. It was all of the little machines, and all these people who were taking care of patients.

Victor continued to share that his mother played a very supportive role in his education:

She was the one that was involved in my science fair projects, homework, and things that I would have questions on when I was younger. She had recently got her master's degree and was involved a lot in STEM, being in the medical profession. She was kind of the one that I saw a lot of the time and when I had questions, or I would just listen to her talk. She would talk about science and about her work.

Larry's mother's pursuit of a STEM education also served as a positive example for him. She took science classes at night at a local school. Larry reflected on the impact of her involvement on him:

Just growing up and seeing her do her work role in the sciences and also doing my work, those things just sort of meshed and it really was a motivating factor that drove me further into pursuing the sciences.

Other participants, such as Darren and Eric, both from the Northeastern part of the state, had family members who had attended Pioneer. Both discussed how seeing family members attend Pioneer, along with the support of their parents, motivated them to apply to and attend Pioneer. As Eric shared:

I had two cousins and one good family friend that all went to Pioneer before me. I had been to campus several times and I had [heard] my cousins talk about it. I had seen how it had propelled them coming from the same part of the state.

Darren had an older brother who had graduated from Pioneer when he was in middle school. As a result, Darren had visited the campus often and had had a glimpse of the types of things that students were able to do at Pioneer. He shared how his brother's Pioneer graduation was very positive for him:

I had a brother who had, five years before me, went [*sic*] to Pioneer. He was the first person in our area to graduate. I went up there and hung out with him for a couple of weekends. I saw the clubs that he was in, and we would come up to campus to support him as a family. I just realized when I was ten years old, this is something that I knew that I wanted to do in five years. At first, it was like, "Oh I get to get away from home early, but then as I got older, I realized how valuable an opportunity it was."

Darren went on to talk about his parents' expectations for him and his education:

Both of my parents were really involved in my life. It was always [that] education just seemed to be the way out. They didn't accept mediocre when it came to education. They didn't accept, "you can't do this, or you aren't smart enough to do this." It was always, "the world is yours, you can do whatever you want. You really can do it and we are here to support you, whatever that choice is."

This theme emerged from the participants' narratives of the support they received from family related to their educational interests and academic pursuits. Participants benefited from family that encouraged and celebrated their academic successes at an early age. It was evident from the interviews that a supportive family helped the participants in their decision to apply to and ultimately attend Pioneer. All participants shared that the support that they received, not only to attend Pioneer, but also for all their academic goals, was a positive factor that encouraged them to further their educational pursuits. Whether it was seeing an older sibling or cousin attend Pioneer, witnessing a family member's success in a STEM field or career, or receiving overall support from their parents, participants applied to and entered Pioneer with the encouragement of and support from their family. Family played a significant role in participants' ability and decision to attend a residential school for their final two years of high school.

**Seeking Greater Academic Opportunities: "I had aspirations and dreams of doing big things."**

As the participants reflected on their experiences at Pioneer, they recalled their educational experiences and opportunities prior to coming to Pioneer. In the previous section, I shared that each participant acknowledged the support of their family in their educational pursuits. In this section, I describe the next theme that emerged from this study: that participants were highly motivated to apply to and attend Pioneer to seek greater academic opportunities. Two subthemes that further support this theme are interest in and exposure to STEM, and limited opportunities at home high school.

***Interest in and Exposure to STEM:*** Participants realized that they developed an interest in STEM at an early age. They reflected on their exposure to STEM programs and disciplines

and how their success and achievement in those programs motivated them to seek further educational opportunities. Participation in these programs enhanced their initial confidence in their academic abilities and relationships. These experiences and stories help understand the participants' motivation as they considered the decision to apply to and attend Pioneer.

Sean participated in a STEM program after he moved to the Southeast from New York and reflected on the experience during his interview:

I got involved with STEM-based programs for underrepresented minorities to get encouraged into the STEM field. I was a kid that really took academics seriously. I got really involved in middle school. I was participating in competitions and going to conferences, which helped [build] my interest in STEM. It is something that I had a passion for. I was always involved and I had great relationships with my teachers.

Keith discussed his ability to do well in math and science. He shared that as a result of his interest in STEM, he was really “pushing hard” for a career in health care. That interest ultimately led him to a high school academy focused on STEM career tracks:

I was always pretty big on math. Growing up that was my favorite subject. I didn't really start to fall in love with science courses until I was in high school. I knew that I wanted to go into health care and kind of already was doing research into what the requirements were for certain fields. I knew that a science background was important or would be very helpful. Before coming to Pioneer, I attended an academy within a high school in my hometown. It was a school within a school. It had a different curriculum where they were moving people towards either health care, engineering, or another track.

Like most of the participants, Jackson and Larry both reflected on their initial interest in math and science. Jackson's interest in these fields led him to tour Pioneer when he was in middle school. He said: "The campus looked a lot cooler than the schools that I had already gone to. It was an exciting prospect. The ability to take better science and math classes and be on a campus like that. I liked that." Larry talked about how his interest in math and science motivated him to consider attending Pioneer:

Growing up in my school and stuff, I always gravitated toward math and science. Those are two things I really loved to learn in school. Going through middle and high school, I was always interested in taking math and science courses, as many as possible just because I was intrigued by that. I was interested in pursuing learning on a different level so that challenge that Pioneer offered was something that really appealed to me. It was the main reason that I did apply because I wanted to really accept that challenge of higher learning, being in that type of environment, and seeing how I would react to it.

Participants often discussed how they ultimately "followed their strengths," which led them to pursue their interest in math and science. In his interview, Thomas shared how math and science came easier for him than other subjects did, especially considering his move from Nigeria to the United States. He shared:

I remember particularly math and science came a little easier for me. When we moved, we had already done some of the stuff that they were doing here, so that was helpful. I didn't like to read. I regret that now, but I did not like to read that much when I was younger. But the science and the math came a little easier, so I think I just followed the strengths.

Several participants did not have early exposure to STEM, but their interest in STEM motivated them to seek more than was available in their home high school and community.

***Limited Opportunities at Home High School:*** All participants were at the top or near the top of their class at their home high school prior to applying to Pioneer. All participants decided to apply to and ultimately attend Pioneer to seek greater academic opportunities than were available their home high school. In most cases, participants expressed a desire to challenge themselves and attend a school known for academics. In his interview, Victor explained that he had a desire to be in an academic environment like that the one at Pioneer:

I really wanted to go somewhere that I really did feel like I belonged at. I felt like that was a school for those people that were driven, a school for the nerds. That was a place where people who were trying to the extra mile, who had already kind of taken care of and gone through all the resources that were offered in the general education system in the state.

Being in an environment known primarily for academics appealed to all of the participants. Several participants believed that their home high school did not place an emphasis on students who excelled in the classroom. Participants perceived that the spotlight was on other aspects of the school, such as the arts or athletics. The opportunity to attend a school with academics at the forefront of its identity was appealing to participants, especially Keith. Keith attended a high school known for its athletics and its several state championships. For Keith, applying to and attending Pioneer was exciting:

My home high school seemed like it was promoting things that necessarily wasn't [*sic*] things that I was super interested in. It was very sports driven; great state championship basketball team, football team, things like that. Not that it wasn't promoting education,

but I felt like you kind of knew who the popular kids in the school were, and it kind of seemed like that students doing well academically were not given the recognition that [they] deserved. So, the idea of going to a school that was about academics really stood out for me. I was like, this seems like it would be a good fit for me.

Sean shared a story of how his 10th-grade counselor sparked his interest in applying to Pioneer:

In the 10th grade, my guidance counselor told me about Pioneer. [She] said, “I think you can do great there and that you should go to expand your opportunities. The school here is good but this school is not going to really prepare you to compete.” She encouraged me to speak to a former student who ended up going to Pioneer. She talked to me about her experience and she highly recommended it.

Several of the participants discussed reviewing the course catalog prior to applying to Pioneer. The course catalog provided participants a glimpse of the courses and potential pathways that they could explore while enrolled. Aaron, who ultimately majored in computer science in college, exhausted the computer science courses available at his home high school by the 10th grade and enrolled in virtual computer science courses. There were no additional in-person or online courses that he could take through his home high school. In his interview, Aaron described his excitement after reviewing Pioneer’s course catalog and finding out about the computer science courses he could take:

I was looking for opportunities that I wasn’t finding at my school. I heard about Pioneer. Personally, my big thing is to read the entire course catalog, and I fell in love with the school and I applied. My initial motivation was connected to the fact that they had computer science courses after AP computer science. I had already taken that and I knew that I wanted to do more in computer science. I was learning everything that I could

online and I was literally at the limit of my computer science education if I were to continue to stay in my old public school. By the limit, I mean, not only at my school but through the state. My school did not offer computer science classes. This was the limit that I could take via the state's virtual public schools. I knew that I was at the limit and I wanted to seek out more.

Limited opportunities was a common concern for participants in the study. There were several participants who grew up in a rural part of the state, and their motivation to apply to Pioneer was the desire to have similar educational resources to those perceived to be available to students in large, metropolitan areas. In his interview, Taylor shared that he wanted to apply to Pioneer because his home community did not have many of the educational resources as available to those in major cities in the state. In his home high school, the highest math class that was offered was precalculus, and the highest science class was chemistry. He said: “[I knew that I had] talent in science and math and I did not want where I am from geographically to limit my ability to learn more at a young age.”

Taylor, who is now a medical school student, was able to participate in a summer enrichment program through Pioneer for four years between middle and high school. The summer program enabled a small group of underrepresented minority students from the Northeastern part of the state to discover Pioneer. The program allowed Taylor to take courses at Pioneer as well as explore local universities and labs. In his interview, he shared the impact of his participation in the program:

I first heard about Pioneer through a program for middle school students from the Northeastern part of the state. It was a four-week summer emergent program into STEM. I went through the program for four years and I knew through participating in the

summer program that you don't have to necessarily be status quo. When you go through the program, you are going to Pioneer and you are learning some of the science and math that we teach our students. So, you find out if you could do well there. Through the program, I got to stay on campus each summer. We got to go [to] several research colleges and universities and see the connections that Pioneer has. While there, we also got to interact with teachers that taught at Pioneer. They taught at a higher level than what I was used to being taught in my home school. I really liked the challenge, even though it was during the summer. I knew that I wanted to be challenged like that all the time. At Pioneer, it was constant immersion of trying new things and learning new things.

Like Taylor, Eric grew up in a rural part of the state. He also did not want to limit his opportunities because of his location:

I wasn't coming from a really good high school that had really good sports or any of that stuff. I was coming from a depressed part of the state. For me, I had aspirations and dreams of doing big things and I just didn't feel like I was going to get the education foundation that I needed where I am from.

Familiar with the school from cousins who had previously attended Pioneer, Eric shared that he wanted to go to Pioneer to "enhance his educational opportunities." He shared that his story and the stories of others who came from rural areas were "different than those who come from metropolitan cities." Darren, who also was from the same part of the state as Taylor and Eric, expressed similar concerns about the lack of opportunities in his home community. He recognized the value of the opportunity to attend Pioneer during his freshman and sophomore years when he realized the limitations of his home school district. Darren shared that after seeing

his older brother's experiences and opportunities at Pioneer, he knew that Pioneer would "open those same doors" for him.

This theme further explored participants' motivation to attend Pioneer as they sought to expand their academic opportunities. The majority of participants recognized that they were not academically challenged by their home high school in the way that they needed. All participants shared that their desire to seek greater academic opportunities motivated them to apply to and attend Pioneer. They desired more opportunities and sought challenging courses in science and math. They recognized that Pioneer provided academic opportunities that could benefit and assist them in the future.

**Adjusting to a Residential Math and Science High School: "It was an eye-opening experience."**

Participants recalled dealing with the "eye-opening experience" of attending a residential STEM high school. Participants recognized that it was an adjustment to attend a residential STEM high school. Some adjustments included new challenges, such as an increased academic workload and questioning academic ability. In addition, participants had to adjust to a different student body demographic. Despite being several years removed from the experience, several participants discussed the "culture shock" of leaving their home high school and community to attend Pioneer. Two subthemes emerged from participants' reflections: adjustment to increase in academic rigor and adjustment to a PWI. Both subthemes highlighted the effects of adjusting to a new environment as participants entered Pioneer.

*Adjustment to Increased Academic Rigor:* A pivotal experience at Pioneer for participants was recognizing that they were in a rigorous academic environment, which for many, resulted in some doubt about their ability to be successful at the school. Participants came

from across the state and the size and the quality of their home high school varied. All but one participant attended a public high school prior to coming to Pioneer. Participants were keenly aware of the increased rigor at Pioneer and that adjustments were necessary for them to be successful in the classroom.

For many participants, their time at Pioneer was the first time they experienced no longer being the smartest student in their class or at the school. Participants discussed candidly the increase in academic rigor at Pioneer. Victor shared a story of how he realized he was a smaller fish in a bigger pond when taking a placement exam:

It was humbling that you were no longer the top dog, the smartest person, or one of the smartest people in your class. I remember even at the placement exams, a bunch of us from the same high school had gotten in. We were sitting together. The school said everyone who had taken calculus or above, get up and go to X, Y, and Z room. Half of the gym of over 400 students get[s] up and starts walking down. So, all of us are [thinking], what is going on? It seems like we were doing pretty well but calculus was this astronomically far away topic that was the holy grail of being smart at my home high school, but at 12th grade, not before coming to Pioneer. I think even then, seeing all of these people who had already taken it was a shock.

Victor went on to describe the transition to more rigorous academics after his first couple of trimesters at the school:

The first couple of trimesters, you realize that you are not as smart as you think you are. What you think is smart right now is kind of average. Not just one standard deviation outside of smart but now we are able to see what two, three, and four [standard deviations look] like. I thought that was a big adjustment for me at Pioneer. A couple of lower

grades that I was used to were kind of eye opening for me. Then, realizing: that is done. That dream is dead. That is not the way that this is going to go. Learning not only that you are not good at everything but learning how to use resources. Those were some hard lessons and it took a while to kick in. All of us were trying to figure out lessons that a lot of people in college now are trying to figure out, and having imposter syndrome, and trying to balance school and home, and any social interaction that you have while you are both at school and simultaneously at home.

Likewise, Larry had a similar story of recognizing that he was no longer the smartest kid at his school. Before coming to Pioneer, he was at the top of his class. Once he got to Pioneer, he recognized that he was no longer the “smartest in the class.” Aaron also had to adjust to a different level of academic competition at Pioneer:

I was pretty near the top of my class of a few hundred people. I felt like I was good at what I do. I quickly learned that some people, this was really their life. I remember visiting the guy who lived across from me, and he had taken multivariable calculus before coming in. I could not get into single-variable calculus, and this guy had already taken multivariable. My greatest challenge as a student at Pioneer was my greatest challenge in college. You get hit with a solid dose of imposter syndrome. That was a challenge because I think at that point I had already thought that I was pretty good at what I do, so if someone was trying to be like, “Oh, you are not good at computer science, you don’t need computer science,” I am like, oh no, in fact, I am pretty good at computer science.

Thomas reflected on his academic transition to Pioneer:

The expectation was so high, and it was hard for everybody. There was a lot of figuring it out. I realized that there were other people that were definitely ahead of me in the game. In particular with the arts, literature, and history. I think on the math and science side, I was able to keep up or at least quickly assimilate to it. From the art side, literature, reading, and history, I was not as prepared.

Like Thomas, several participants explained that the academic rigor extended beyond science and math courses and described the increase in rigor for humanities courses. In his interview, Jackson identified the importance of the humanities at Pioneer. He felt underprepared to “write really good essays.” Similarly, Taylor shared that his greatest academic adjustment at Pioneer involved humanities courses:

The biggest adjustment for me was [in] American Studies, because I had always been challenged by my English teachers. At my home high school, ... one thing that I thought that the school did really well was teaching you how to write. But I guess they were teaching you how to write the basic five-paragraph essay. Transitioning to Pioneer and taking American Studies, it was like, we want you to use multiple sources to make an argument about this thing that happened in history or this thing that happened in literature, and we want you to use both the literature and the history together. That was the hardest concept for me to get in my first trimester, especially as a student not being used to that, having to use the history and the literature to make an argument about something that happened.

In addition, during his interview Taylor talked about the struggle that he encountered at the beginning of his time at Pioneer. He shared the challenges from transitioning to Pioneer from a rural part of the state:

In the beginning, it was very rough. Being from a rural Northeastern part of the state, where the expectations were just passing the state test and just doing better than your peers. And then going to Pioneer, and I am next to students whose parents have PhDs in so many different fields and they know so much more than I do. Some of the students were in AP calculus in their junior year or somewhere in higher level math courses. Some were taking AP biology or AP chemistry. I felt like I was constantly competing with some of the other students. I don't know why I had that initial feeling during my first trimester. I did not do well in my first trimester at Pioneer. I think I got a C or two. And one of the things that I realized was that I needed to ask for help more often. Academically, it was a struggle.

Like Taylor, other participants talked about their initial struggle with the increase in academic rigor. For them it was a challenge, especially in light of their previous academic success at their home high school. In his interview, Sean described his awareness of the transition from his home high school to the increased demands of Pioneer:

I was always successful in school. I was valedictorian in my class in middle school, and then I was top of my class before coming to Pioneer. At Pioneer, everyone is at that high caliber and just as talented as you are. Not being the smartest person in the class and not knowing it all, and just having a heavy workload was different. Classes were really good college-prep classes, so it wasn't the normal, turn in a couple of assignments and that is it. It was a full workload, which required us to work in study groups. So, it was intimidating to be challenged that way academically.

Victor discussed the Pioneer curriculum and recognized a difference in class assignments compared to those at his home high school. Although the potential academic challenges of

Pioneer initially attracted him to the school, he soon realized that he was not as prepared for the academic rigor as he anticipated. He shared:

I don't think I was prepared for Pioneer from an academic perspective. I was not prepared for the way that the classes function. In general, a lot of courses at my home high school was [*sic*], here is the lecture, take some notes, turn in this paper, you get the grade, come to class every day to do all these little kind[s] of tiny assignments. Do this one group project, and maybe retain a little bit of the information for the exam. Then you are going to get the A. At Pioneer, there was no more busy work. Every assignment has more purpose to it. Things kind of accrued. Things are aggregated.

Larry also described his academic transition to Pioneer. He shared that his previous approach to academics no longer proved effective at Pioneer, and he had to find a new approach:

I was somewhat prepared for Pioneer. That said, the way that I studied in school before, I had to completely abandon that. I learned that after the first trimester. It was like nothing that I learned in school in the ninth and tenth grade. I had to scrap all of that and come up with something new. It was a whole different approach because each class in the math or the sciences or the humanities, everything was different. It was sort of like a different approach to everything that I had to develop for the rest of the year.

The increase in academic rigor created a stressful environment for participants. They discussed their adjustment to a different level of academic stress at Pioneer. In his interview, Jackson described the increase in stress at Pioneer:

The classes were really tough. I was used to being at the top of my old school, always excelling. This was a place where I would not excel at first. That was rough. It was very stressful. I don't think that I have ever been that stressed in my whole high school

[career]. I don't know if that is a product of me being a freshman and a sophomore at my old high school and then taking junior and senior courses, which you would expect to be harder, or if it was the rigor of Pioneer. Pioneer was the first place I pulled all-nighters. I don't even pull all-nighters in college. It was really, really special. I don't even remember doing homework at my home school. I always did homework in the class before school. I didn't have good time-management skills, and I still don't, to be quite honest. I improved, but I still lack in time-management skills. I was not prepared for the level of rigor. I was not prepared for the level of depth. I took a precalculus class in my home high school and took it again at Pioneer, and I did not do well. This is a class that I had already taken. I just did not understand. It was like another approach. It was like taking a bigger-picture-look at what you are learning.

Like Jackson, Victor talked about the stress of adjusting to life at Pioneer. He described what it felt like to experience the "ups and downs" of being at the school:

Some days, it was [like] you were on top of the world. You got into this school. On days when you had multiple assignments due, it is quite draining and exhausting being there. The pace does not stop. There was, what I think is echoed by other alums and especially Black students, there wasn't as much [*sic*] resources for mental health when I was there. Realizing just how much stress was being incurred, and just how much pressure I think we put ourselves under, that I think just by reputation of the school may have put on us as well. I think there was a large amount of stress that was incurred. Every single thing you do required you to be at 100% all of the time. The classes, the leadership opportunities. When you are a senior, you are now in leadership positions, in to research, in to mentorships. You are now doing all of these pretty miraculous things

but all of them are extremely demanding. Especially, when you are looking at the fact that we were 16, 17, and 18 coming to Pioneer. We were quite exorbitantly [*sic*] young.

Despite feeling stressed and overwhelmed, participants acknowledged how the increase in rigor fueled their motivation to succeed. Keith believed he would “rise to the occasion.” Like Keith, Darren shared that he needed to take his academic performance to the next level:

Pioneer made me embrace challenges more. I needed to get more serious about that part of my life. Not that I didn't take academics seriously. I took them seriously more times than not, but at Pioneer, one of my biggest challenges was, what do I really want out of this and how do I weave what I am learning here into regular life lessons. I guess I was unprepared given where I was coming from, but I was mentally prepared for the challenge. I realized that I got [*sic*] to take it to the next level if I want to be successful here and if I want to stay afloat here.

Lastly, Eugene talked about how he dealt with the increase in academic rigor:

Academically, I may have been behind somebody who maybe went to a school that had a little more money or more resources. I think it just caused me to work more towards catching up with them, really just taking my time to ask around and get any help that I needed so I would not fall too far behind. I knew that I didn't want to leave. I didn't want to feel like I was quitting on anything. Even though I wasn't as academically prepared, compared to some other students, I realized that I was going to work that much harder to fill the gap. The transition academically was tough at times. The professors were really available, and they were patient, and they were understanding, and they were helpful if you needed help with something.

This subtheme, the adjustment to increased academic rigor, highlighted some of the challenges that participants faced when transitioning to Pioneer. Participants reflected on their initial experiences at Pioneer and revealed the academic challenges that emerged as they transitioned from their home high school to Pioneer. Some participants had to adjust to not being the top student at their school. Other participants had to develop new ways of studying to keep up with the course material. Several participants admitted that their two years at Pioneer were the most difficult two years of school that they ever had. Ultimately, the challenges developed into motivations. Collectively, the participants shared how they had to further develop and strengthen their academic skills to adjust to the rigor at Pioneer.

*Adjustment to a Predominantly White Institution (PWI):* One of the adjustments participants documented was an awareness of their race and culture. In Darren's interview, he succinctly stated that in his hometown, "it was not cool to be smart." His academic ability was not something people "wore on [their] sleeve." Participants also identified their adjustment to a "different type of diversity" as an important part of their transition to Pioneer. The demographics of the student body at Pioneer mirrored those that the majority of participants encountered when they enrolled in college. Participants described the Pioneer environment as similar to attending a PWI and identified challenges from their transition to that environment. After further reflection, they also discussed how exposure to the collegiate environment at Pioneer served as an ultimate benefit.

Participants talked openly about "being the only Black male in a class" or "wishing that there were more Black students at the school." Some described differences between Pioneer and their home high school environment. Participants recognized that they were treated differently and experienced adversity because of their race, which led some students to question themselves

and their abilities. For others, the experience served as a motivating factor to prove themselves.

During his interview, Taylor explained his feelings of isolation in the classroom:

In a lot of my classes at Pioneer, I was frequently the only African American male, especially in STEM classes, like my science class. I remember my chemistry and physics classes, I was the only African American male in my class. I remember a situation in my calculus class. I was in a group, and it seemed like nobody in my group wanted to really talk to me, ask for help, or even try to get my opinion on things. I don't know if it was because of my race or because I was the only junior in the group. It seemed like they were not asking for my feedback on a group assignment. That was the only time where I felt like I really questioned my position at the school for my race.

Jackson shared a similar story to Taylor's where fellow students did not want to work with him in small group settings. For Jackson, the experience motivated him:

When I went to Pioneer, it was the first time that people did not want to work with me in breakout sessions in the class. I was starting to ask myself, what is wrong, you know they are not even addressing me, they don't want to collaborate. They did not want my input. That was a tough thing for the first trimester. I did feel this pressure to prove myself.

Several participants discussed how other students questioned their achievements due to their race. In his interview, Aaron discussed two situations where his peers openly linked his acceptance into a program or into school to his being African American. He described his peers' reaction when he shared his acceptance into a competitive research program at Pioneer:

When I got into the program, people were like, "Oh, how did he get in? What research experience does he have? How is he good enough?" When you get chosen for anything,

people start questioning why does he deserve it. I felt like I had worked hard to get in, but being Black, I feel like we had to deal with those types of thoughts and questions from peers.

Upon his acceptance into several colleges, Aaron recalled a conversation with a White student who lived on his hall. In his interview, he described a common issue faced by African American students:

After the college admissions period, it was a very trying time for Black people at Pioneer. Even if you do well, if you get into elite institutions. If you get into an elite institution, everyone is going to be looking at you and thinking, “you got in because you are Black.” I remember one time talking about how I got into a college and I am probably not going to attend because they were not offering up enough money. One of my White hall mates didn’t get into that college said, “Yeah, I wish I could have got a scholarship to go to that college, but I am not Black.” I responded, “It was a merit-based scholarship,” and he apologized. But the sentiment was there and I felt like I am getting into a few of these Ivy League schools and I am pretty sure people just think that it is because I am Black.

Jackson recounted a similar story:

When we were getting into colleges, a hallmate was mad because one of my roommates got a scholarship. He thought that he got the scholarship because he was Black. It seems silly now but back then it was like, wow, you really just said that. We already felt that. That is why I didn’t post or share where I applied to at all. I did not need anybody telling me I got in because of this or that. At one point, finally, we said, you know, this is where we got into and felt more comfortable sharing.

Despite having significant academic success at Pioneer and a perfect score on the SAT, Michael, who ended up attending a highly selective private college, believed that his race impacted the advice that he received from his guidance counselor regarding the college admissions process:

I had some frustration. I contacted my counselor and she was looking over my college list. She encouraged me to diversify by applying to some schools that I hadn't really been considering. I think that there was an element of arrogance where I was applying to XYZ as my safety school. I was planning on applying early so I still had time to change that up. But, she suggested that I apply to ABC, which I thought was an interesting suggestion given my academic record. I felt like I was a top contender for a lot of the high-ranked colleges in the US. I had a perfect score on the SAT. I had all these leadership positions on campus. I had a good GPA in some really challenging courses. I felt like I had a high-quality application. So, I was sort of surprised by the colleges that she was pushing. Not to say that they were not good colleges but given wh I was interested in and my academic background, I was surprised.

Several participants discussed how they dealt with perception issues not only related to their race, but also to their hometown. During his interview, Keith reflected on the perceptions he faced from faculty:

I can tell you about where I am from and someone else can tell me where they are from. You don't know that much as a 15- or 16-year-old about what the counties are like, or enough to know how strong you are. I just assume[d] coming into the school that everybody's performing at a high level academically. It's not until later and learning more about the admissions process as well as just having friends who expressed to me

that they found some courses more difficult than I did. We didn't talk about this in my old school. I learned that there were different levels of education across the state. Having them [the faculty] know where people are from and they have been teaching students across the state for a while, I think they had formulated certain expectations. Plus, I think you can't help but have the influence of society, that [is] pretty much showing on a rare basis, African American men in a positive light.

Keith continued to discuss how his awareness of race affected his focus and motivation:

I think Pioneer was probably the place where I first started to see what I felt were disparities based on things like race and encountering how I felt things occurred and how people might have more opportunities because of their background and race. Initially I didn't really think much about race, but then I soon realized that I needed to be on point to make sure that all my *i*'s were dotted and *t*'s crossed. I made sure that there was no reason for anyone to think any less, or assume that I wasn't meeting expectations. I would say that I was more careful. I went into it knowing that there were certain things that I can't get away with. I still live by that today. Just being extra cautious all the time. It is unfortunate, but I think for Black males, we know that is the society that we live in. I just tried to understand that dynamic and not let it deter me from succeeding.

In his interview, Sean compared the demographics of his home high school to those at Pioneer. He found it challenging to go from a school where 50% of the student body identified as African American to less than 10% African American at Pioneer. Like others, found that the difference was "eye opening." He shared that it "was different to get comfortable with being the only Black guy in most settings." Though he recognized the differences in demographics, Sean also admitted that the experience helped him prepare for college. He explained:

I grew and matured at a rate that I would not have been able to do at home. I got to see a ton of different cultures, which allowed me to see the world differently and see that not everybody is like me.

Similar to Sean, Darren discussed his awareness of and adjustment to the diversity at Pioneer. Although it took some time to adjust, he described positive takeaways from the experience:

Where I am from, it is not the most diverse place. It's obvious. You have got Black people and White people around. The only people of Eastern Asian descent that I knew worked at some of the clothing and convenience stores around here. So, coming to Pioneer, where I am actually interacting with people from these different groups, was shocking at first. I could have just been really naive. I had just turned 15 before coming to Pioneer. Just being around different people, it was exciting. You could call it a melting pot. I liked it. Because again, I looked at [it] as an opportunity to learn more about myself as I learn[ed] more about other cultures and other people. It was definitely shocking at first, but I think I came to benefit in ways that I would have never imagined. Just being exposed to different viewpoints and stuff. Viewpoints that you probably would have never thought of before. You've got to be open-minded.

This subtheme revealed that participants had to adjust to a “different type of diversity” at Pioneer than what they were accustomed to in previous learning environments. Participants described increased awareness of and exposure to different cultures and different types of people. Participants also discussed how they became more aware of race and racial identity based on their experience in a predominantly White environment. Participants discussed how they started

to question their ability and accomplishments as a result of their race and how they ultimately dealt with those experiences.

Both the demographic and academic differences foreshadowed what many of the participants encountered when they entered college. Participants explained that their experience at Pioneer as African American males was similar to the experiences shared by many African American males who attended a top-tier PWI for undergraduate or graduate school. Participants acknowledged that attending Pioneer required adjusting to the academic rigor and navigating through a different racial environment. Overall, the transition to Pioneer was a unique experience not shared by many in their final two years of traditional high school.

In the next section, I will review the fourth theme that emerged as participants transitioned through Pioneer and ultimately found success in a rigorous STEM environment.

**Achieving Success at a Residential Math and Science High School: “It was the biggest growth spurt of my life.”**

Participants confirmed that they were able to achieve success at Pioneer. The title quote for this theme comes from an interview with Thomas where he reflected positively on his experience at Pioneer. He shared that his Pioneer experience helped shape his identity and greatly influenced him in life. Other participants echoed similar sentiments about their experience at Pioneer. In this section, I will present four subthemes to outline the factors that contributed to participants’ success: (a) support from high-quality faculty and staff, (b) supportive African American peer community, (c) meaningful leadership and participation in cocurricular activities, and (d) increased academic and social confidence. Collectively, these subthemes describe how participants were able to succeed at Pioneer despite the rigorous and challenging academic and social environments they encountered.

***Support from High-Quality Faculty and Staff:*** Participants discussed positive experiences with faculty and staff at Pioneer. They recognized not only the expertise of the faculty but also the value of the staff. All participants discussed how they learned to work with adults and use the resources available to them to successfully matriculate through Pioneer.

In his interview, Victor recalled being stunned by the quality of the faculty:

I noticed early on that Pioneer has champions. I am not sure how we managed to accrue all of this, but a significant portion of the faculty have PhDs in their subjects. These are Ivy League grads and they have done all of this research. They are published. They probably can be well funded at other institutions if they decided to do research there, and very well can be seen and distinguished at the state flagship or be able to apply for NIH [National Institutes of Health] funding. But somehow, they were pulling [in] these pretty high-level, well-versed faculty members at Pioneer.

Likewise, Aaron described the impact of his exposure to quality faculty:

The math instructors at Pioneer have been some of the best math instructors that I have ever had. I could say that even in my last year of college. I tried taking multivariable calculus here at college and all of the teaching is worse than at Pioneer. At Pioneer, they actually cared that you are following [along] and that you are learning. In college, I will easily see the teacher lose the class. It is obvious that they lost the class and they just continue. The instruction is different. I am glad that I took some of those advanced classes before I came here. My Pioneer education was definitely my best precollege education. It really was a privilege. I think most of the teachers agreed they didn't want to just give up on someone who they thought had potential. I had good teachers and most of them were on my side.

In his interview, Sean shared that he had great professors who “were not just there to teach.” He believed that the faculty’s teaching enjoyment “transferred over to a positive student morale.” He said:

They really want to show that we learn and demonstrate it. There was [*sic*] some that connected more than others, which is normal, but I talked more about how most of the faculty was [*sic*] very supportive. They were open to questions. They had frequent office hours and would just support the extra attention. I can’t think of any negative experiences. They were very involved and you can tell that they wanted to be there and that they enjoyed teaching.

Several participants believed that they benefited from not only faculty who were of high quality but who demonstrated an interest in students’ overall well-being. The faculty and staff at the school showed that they genuinely cared about the success of each student. In his interview, Larry explained how he benefited from the environment created by the faculty at Pioneer:

They were just very open and warm and welcoming. They wanted you to come speak with them, converse with them, just talk about life, career goals, or things you want to do next in life. Having an open-door policy was helpful. I found that all my instructors had that open-door policy. It was something that was very encouraging and something that I really appreciated. That support was another factor that helped me get to the finish line.

Similar to Larry, Eugene highlighted that faculty members were “patient” and took time to make sure he understood difficult material. Eugene further explained:

I would go to office hours to meet with my chemistry instructor. We were close. She would help advise me academically. I had a good rapport with her and I could talk to her about anything. That was really helpful. Overall, the instructors were really

helpful. They were willing to open up their office hours to off-duty confusions you might have, course material, or go over what was discussed that day. They were pretty dedicated. They dedicated a lot of their time in an effort to help us understand the material. They were pretty patient. After class, I would go up to an instructor when everyone else was leaving and ask them anything I had a question about.

Several participants reflected on something as simple as meeting with faculty during their office hours as pivotal to their success at Pioneer. The majority of participants reported that faculty did not have office hours at their home high school. Jackson acknowledged how different it was to go to a school where instructors had office hours:

I liked my math teacher. He is actually a really good guy. He took the time to help me with the class. At a regular high school, there is no such thing as office hours. There is no time to sit there and chill with a professor. He would post his office hours and he used to explain things to me. I really appreciated that.

Taylor also shared that he was able to take advantage of office hours:

One of the things that I really struggled with as a junior was knowing when and how to ask for help. My first trimester, even though I knew when office hours were, I would never utilize them. I thought everybody was struggling with me and that the struggle was universal. That wasn't the case. Some of my classmates were doing amazing[ly well] on the tests and I was not. I had to learn how to use office hours. If I did not understand a concept, [I had] to actually go up to the teacher after the lecture or the class period to discuss it further. That was something I was not used to doing. I had never done it before. That was a big challenge for me, knowing how to ask for help and when to ask for help. How to use mechanisms that help you as a student in your classes.

Participants acknowledged how taking advantage of faculty office hours at Pioneer helped build the “good habits” that they were able to use there and in college. As Eric stated in his interview, “Lord knows that there were many days in college when I needed to go to office hours as an engineering major.” He went on to share how the faculty “pushed him to go the extra mile” after he worked hard and expressed interest in studying engineering in college. He shared that their support extended beyond the classroom:

They were not only good to me and liked me as a student but they also made sure I kept my butt in line and that I was doing things conducive to and representative of who they knew I wanted to be.

In his interview, Michael shared that the faculty helped him “develop his autonomy, creativity, and ability to sort things out for himself.” He said he felt close to the faculty and that he appreciated them. After graduating from Pioneer, he visited faculty and as a college student, it had been helpful to get their advice. Specifically, Michael shared that he sought counsel from African American faculty on what it was like to be Black male in college:

I had some conversations with faculty members about specific college choices and how [it might feel] being a Black man in that situation. I might need to keep that in mind when I go to college. That was definitely something that came up when I was talking about considering a specific college ... and making sure that I was getting people’s experiences and feedback who were also Black men.

Although Pioneer’s reputation is based on science and mathematics, Thomas talked about how he learned how to write at Pioneer. Fondly remembering a faculty member who had died in the past five years, Thomas shared that this faculty member was instrumental in developing his writing skills:

At Pioneer, faculty are like college professors. It was a little different but it was helpful because I feel like you had more of a one-on-one experience. I remember going to my American Studies instructor's office, and he taught me how to write. I remember he always encouraged me to "read with a pencil in your hand." I think it was just a really good transition to college for me because I think you don't always get that in college where you are still nurtured. I think the faculty at Pioneer definitely still had a level of nurturing, which was needed for some people. I think I was one of them. The faculty was [*sic*] great. You had college-g geared faculty that was [*sic*] still able to help you grow in your academic progress.

In his interview, Taylor explained that the faculty were "passionate" about their discipline and the students. After several years of exposure to a small number of faculty members through his participation in the summer enrichment program, he recounted how those faculty would "check up on him" the entire time he was a student at Pioneer. He said, "I thought the faculty were there to make sure that we were successful in whatever we needed. I thought they were all amazing, and they cared for me if I ever approached them with anything." He also shared how a faculty member went above and beyond to develop an independent research experience for him at a lab at a local college while he was at Pioneer. He said that the experience and interaction with the faculty were instrumental in encouraging his desire to become a biomedical researcher.

In addition to benefiting from working with quality faculty members, participants also spoke about the importance of good relationships with other adults on campus. Due to the residential component of the school, each participant had a SLI, an adult male who lived and worked on the residence hall alongside the students. The participants shared how it was nice to

have an adult who cared about their well-being and success, who would simply knock on their door to see how they were doing. In his interview, Taylor talked about the role that his SLI played when he considered leaving Pioneer:

He was a person that really looked out for me during my time at Pioneer. I feel that he helped me staying at Pioneer, because at one point, at least during the first trimester of my junior year, I thought I was going to go home. I didn't want to stay at Pioneer, and he helped me navigate through that process.

Larry also shared that his SLI played an important role when he was struggling at school. He was accustomed to excelling and being at the top of his class. Once he got to Pioneer, however, he struggled with the idea that he was not "the smartest in class." His SLI helped him understand that he was in a "whole different place." In his interview, Larry shared:

The SLI was useful because I never had the residential experience of living with people away from home. Having my SLI there to facilitate living on the hall with all the guys was really good but also sort of [to] be like a father figure to us during our time on the hall. If we ever needed anything or needed advice or just needed to talk about whatever we were going through. It was really good that he was available and provided helpful insight and advice for everyone. He was also fun, and always had activities for us on the hall.

Jackson described his SLI as "nice" and that he would help him with things that his parents normally handled. Jackson said, "If I had a problem with my phone, he would take me to the store. If I needed to get pants tailored, he would just take me. He would take me and my hall mates and get us dinner." He shared that having an adult that he could talk to and rely on in a

residential school environment was instrumental. Thomas also talked glowingly about his relationship with his SLI:

He was phenomenal. He was relatively young at the time. I can't remember where he was in his career but he was like a grad school figure that helped develop my social life. He helped foster a really good community in the hall and at our sister hall as well. I think the experiences helped me also become comfortable with authority figures and communicating with adults.

Victor shared that his SLI helped build a sense of community on his floor:

He was really funny. I thought he was cool and he was chill. I thought he related to us pretty well. He spoke on the same wavelength as us. I thought that made my experience living in the hall worthwhile. I enjoyed being on the hall because I really enjoyed my SLI. He made a community where all of us were welcome and we were able to both be academically driven but also be kids and have fun.

Aaron benefited from having an African American SLI. He shared that his SLI was “the man” and that he helped served as “an uncle, older-brother-like figure:”

He was old enough for him to definitely be more popular than us and be respected as an authority figure. But, he was down to earth enough to be approachable and someone that you could talk to. [To] talk to about genuine questions and sometimes the existential concerns you had about living. He was a great guy. We still talk on social media sometimes. I think him just being there was [...] just good for me. I stayed on the same hall with the same SLI for two years. There were not many Black people on campus but my SLI being there and being Black was definitely good for me. I know that. Especially because there were not that many Black people on my hall either.

Like Aaron, Sean enjoyed having an African American SLI:

It was good to have someone that was not a professor but also not a student that you could talk to about more of the life stuff. Academics or anything. It is a huge social change and social challenge as well. Living on campus at that young age and being away from home. So, it was nice to have some positive role models, African American male role model[s] on campus to talk to.

In addition to the SLI, participants recalled having positive relationships with other staff members on campus. Several participants shared that they had positive relationships with the admissions staff in particular. Taylor shared that admissions staff members continued to follow up and check on him while he was at Pioneer. In his interview, Larry discussed the importance of his relationship with the admissions office:

Everyone in the admissions office was a really strong support[er] and they were also people that provided useful advice, willing to speak with me about pretty much anything. Pretty much the whole admissions office. I would really spend a lot of time there during my time at Pioneer before I became a student ambassador in the admissions office. While I was a student ambassador, I really spent a lot of time there because of the people that were there to support me.

All participants shared stories of the support they received from faculty and staff while at Pioneer. The support they received assisted with their transition to and through Pioneer. Beyond the challenges identified in previous themes, participants reflected that they benefited from quality and caring adults that went the “extra mile” to help them succeed at Pioneer. In addition to the support that participants received from faculty and staff, participants discussed the support

that they received from fellow African American students while at Pioneer. In the next section, I will explore peer support, another subtheme that emerged from the study.

***Supportive African American Peer Community:*** The Pioneer experience, for many of the participants, provided a glimpse of college life at a PWI. Participants described a “close and tight-knit” community among African American peers, faculty, and staff. Participants sought this community out and developed a “safe” space on campus in the absence of dedicated cultural centers. The connectedness of the African American community contributed to the success participants experienced at Pioneer. Eugene described his thoughts about the African American community at the school:

I liked the tightness of the community. It would be nice if there were more people, because you kind of feel limited with the number of fellow Black males that you can talk to. We just helped each other out. We hung out together. We would spend a lot of time together. It was a tight-knit community. If there was anything that I was struggling with, or felt like my confidence was low, I could go to my peers. I could talk to other Black males that I met at the leadership program and regain that confidence. I could see how intelligent they were, how down to earth they were, and we just vibe[d] the same. That was vital for me being successful, socially and academically.

Eugene reflected that he was able to develop a strong network of African American peers at Pioneer. “We had a good group. We would challenge ourselves academically ... We would have our own study groups. We would work together.” Michael also discussed the importance of having a solid group of African American peers:

I think my Pioneer experience was really good and changed as the way my high school experience was going in general. I really enjoyed it. I was able to make a lot of close

friends. I had a very different friend group demographically. At Pioneer, there were a lot more other Black men and just generally Black students who were interested in academics. I'm still in touch with some of my close friends from that time. During breaks, we would visit each other. We visit each other at college. I remember my senior year, we had gotten into college, or chosen our colleges, and all the Black students took photos together in our college shirts. There was a lot of pride in the group as a whole.

Like Michael and Eugene, Thomas discussed the closeness of the African American community on campus:

Being that there were so few of us, a lot of us were pretty tight. Even if we lived on different halls, you knew everyone by name. It was helpful to have a community outside of your hall. I think I probably had more Black friends at Pioneer than I had previously at my former high school. Like close Black friends. I think that was a benefit. At my former high school, I was in all the honors classes. There is not a lot of us [Black students] in there. There is not a lot of minorities inside that. I feel like unless you did sports or certain clubs, your social circles are defined by your classes. At Pioneer, you're literally living with these people. We run whatever club, we run it together. You just get to interact together. You see them at lunch. You see them at the cafeteria, so whatever the case may be, there were more opportunities for building those bonds.

Taylor also shared how the tightness of the African American community extended to the administration:

They looked out for all the African American males. I remember my junior year, they had a meeting with all the African American males on campus about how we should feel safe, and if we ever feel like we are unsafe, who we should go to. Then, my African

American male seniors, they also looked out for me a lot as well. I'm still really close friends with them as well. I feel like being an African American at Pioneer at the time that I was there, there was a really supportive environment. Even though sometimes our counterparts that were from other races necessarily would not understand it and would make jokes. The African American community was always super close and tight knit. I remember at the time, it seemed like the Black faculty and administrators that were there were very supportive. They made the navigating part not necessarily as monstrous as it could be at a predominantly White institution.

In his interview, Keith shared that despite occasionally feeling like "outcasts," African American students stuck together:

We needed each other to get through the whole experience. I would say that without my core group of friends who were like me looking out for each other, I don't know that we would have made it through the same or had the same experience.

As Eric shared:

We had to compete more. We had to define our rightful place, defend our relevance on top of, thriving in a space where we were the minority not just racially or ethnically, but also in the fact that we were less [in number]. I think we were about four percent of the campus when I was there. I think it was interesting because we found ways to create safe places and safe havens whether it was in the grill, or in the gospel choir, or having our how little separate hangout area. We also knew those people's offices that were safe places and safe havens that everyone knew. You wouldn't have thought that there wasn't a multicultural center when I was there in school because everybody knew, have you talked to Dr. B about it yet? Or have you been able to talk to Dr. M? Have you gone and

vented to Dr. B? You had certain people that we knew who to go. Because that was our safe space.

Participants utilized their network of African American peers at the school to make the place feel more comfortable. Despite being a small percentage of the overall student population, participants discussed how they, as African American males, benefited from a tight-knit community. In the absence of an African American cultural center, participants relied on their peers, faculty, and staff to make the environment safe at Pioneer and to assist with academic and social experiences. Sean provided an insightful example while discussing a metaphor to describe his experience at Pioneer:

A Black fist. . . When I was there, I definitely came up with my identity of “I’m an African American male in a field that a lot of people don’t look like me.” So, I just didn’t shy away from that challenge there. I made sure that I built my network around that. I saw other African Americans doing the same thing and just making sure that we were represented well on campus and that we were successful.

Michael shared what it felt like to be an African American student at Pioneer:

I think that all Pioneer students feel like they’re a little bit of an exception or something that’s rare to find. But I think to the Black student, that feels especially powerful. And you’re not just trying to prove that you are exceptionally smart but [that] the entire race is also composed of exceptionally smart people.

This subtheme highlighted the positive support that participants received from fellow African American students while at Pioneer. Despite representing 10% of the student population, participants found a home community away from home with their African American peers. They developed meaningful relationships and formed strong networks with these peers in

order to adjust academically and socially. The support from a tight-knit, African American peer community was a positive factor in participants' transition through Pioneer.

***Meaningful Leadership and Participation in Cocurricular Activities:*** Participants emphasized the importance of cocurricular and leadership experiences during their time at Pioneer. For some participants, these experiences provided an “outlet” from their academic responsibilities. For others, participation allowed them to explore career opportunities. These opportunities contributed to a home away from home environment and helped participants take ownership of their overall experiences at the school. Participants also noted that the availability and the quality of these experiences did not exist at their home high school.

In his interview, Eric spoke at length about how he benefited from participation in outside-the-classroom experiences. While at Pioneer, Eric was involved in robotics competitions, the mentorship program, athletics, admissions, and NSBE. As president of NSBE his senior year, he helped expand the size of the organization and participated in a national design competition. He shared proudly:

I had some great accomplishments as NSBE president. I grew our membership of the chapter at Pioneer by a great number. We were organized; we were respected on campus to the point where we had non-Blacks wanting to join and actually joining. On top of that, the engineering design competition brought the best and the brightest from all over the country, and we had to design these robots that could perform certain tasks, and so to have led that, that meant a lot. To think about the person who I was and where I was coming from, to be able to go to a school like Pioneer, and have that platform and then go on to win at a national level: the title, bragging rights, and monetary awards, that was huge.

For someone like Eric, the cocurricular opportunities that existed at Pioneer were “unheard of” in his both home community and high school. He credited the exposure to these resources to his development:

Being in NSBE at Pioneer and competing in robotics competitions and things like that, I mean that was something that was unheard of from getting involved in from my home town. All of these resources and things that I just did not have ... an awareness of ... before coming to Pioneer. They were so rich in creating a community and an experience that really shaped who I am today.

Like Eric, Aaron was involved in a number of different clubs and activities, including serving as president of NSBE his senior year. He also served as treasurer on the executive board of the State Technology Student Association and as a teaching assistant for computer science. In his interview, he shared that he was “just given opportunities and he took them.” Aaron described his greatest accomplishment at Pioneer, which was his involvement on a diverse team that won an international math competition:

It was a group of us, and we were in a room for 48 hours and we had to develop a solution to this math problem. To most people, we were the throwaway team because it was like one Indian guy, and a White girl, and a Black guy. It was the most diverse team out of all the teams. Most of the teams were either all Asian men or women or a few White guys and a few Asian guys. I guess most people didn't think we were all that good, but we eventually ended up working pretty well, and we actually had a really good time just doing the event. I guess our theory was also good and we won the competition. It was really, really crazy.

Michael was also involved in a number of different outside--the-classroom experiences. In his interview, Michael listed the clubs and activities that he participated in and what he learned from them:

I was really involved on campus. I was on the mock trial team. I was an RLA. I was treasurer of NSBE and we won nationals. I played varsity baseball my senior year. I was able to play on a sports team, which I probably wouldn't have made at other schools. I founded a club called the Gentleman's Club for Aesthetic Living. I was captain of a fan support group for the women's volleyball team. I felt like it was all really good for helping me develop my leadership skills. I was able to be a residential life assistant, so that is kind of like an RA [resident assistant] in college. So, having that leadership experience was key. I think it helped me engage with the student body. The involvement helped me to sort of have a wide group of friends from school who now have ended up all over.

Thomas shared that his participation in outside--the-classroom activities helped him to grow. He said that he became more social through these experiences:

I was a student ambassador and that was awesome. I was involved with NSBE a little bit. I was involved in HOSA, which was a health occupation[s] club. It was focused for students who were looking to go into medicine. I was also involved in a Christian Bible study group. I think the diversity of Pioneer, you literally meet everyone from everywhere. It was a very influential time in my life. I learned about leadership. I got leadership roles that forced me out of my shell, that forced me to be more confident, that forced me to take ownership of a lot things, and really just grow.

Taylor talked about his leadership experiences and how his involvement surpassed his expectations:

I was an RLA my senior year. I really liked that position. It was probably one of the things that I was most involved in. I was also in dance ensemble my senior year. That was a really fun learning opportunity for me. I was also involved with NSBE. I was involved in that for both years. I also was involved with Africa Fest and Latin America Fest. I think having something outside of academics was really big for me personally. I think for me, the biggest thing was to actually break out of my shell. So, I actually was one of the leaders in Latin America Fest my senior year. When I came in my junior year, leading a fest, that was not one of my intentions. And then I actually, not necessarily forced myself, but actually volunteered to be one of the leaders for a cultural festival. That was one of the more challenging things that I did, but that was also one of my proudest achievements that I've had to date is to organize a cultural festival for students by students.

For some participants like Keith, their involvement in clubs provided a social outlet:

I was on the tennis team both years. I did swimming one year. Most of my involvement was related to having a social outlet. I did most of the organizations that my friends were in, like NSBE. I wasn't really big into engineering, but I thought, it is a STEM-related organization, a lot of my friends, a lot of people of color were involved, I liked the advisors, they go on trips, they go visit different colleges. So, even though I was not 100% interested in engineering, this seem[ed] like it align[ed] with my interests.

This subtheme, meaningful leadership and involvement in cocurricular activities, demonstrated that participants were not just students enrolled at the school, they were leaders at

the school. Participants discussed how involvement in leadership and cocurricular activities positively impacted their experience at Pioneer. Participants were significantly involved in athletics, academic competitions, and clubs. Several participants were club presidents. Other participants were on award-winning teams for academic competitions. For most participants, the quality and availability of these types of experiences did not exist at their home high school. Participants reflected on these experiences as a positive factor in their transition and success at Pioneer. Participation in these experiences provided a “sense of ownership [of] and investment [in]” their experience. In addition, participants believed that involvement in leadership roles and participation in cocurricular experiences helped develop their confidence.

***Gaining Academic and Social Confidence:*** Participants shared stories of how they built confidence both inside and outside the classroom. Several participants credited Pioneer for assisting with their “confidence boost.” In his interview, Jackson shared that his experience at Pioneer influenced his decision to be a chemistry major in college. He also shared how his experience as an underrepresented minority prepared him to attend an Ivy League college. Speaking about his experience, Jackson said:

I chose my major because I liked chemistry a lot in high school and I was able to explore that in depth when I was at Pioneer. It definitely influenced the major I chose. In addition to that, culturally, it was part of me getting used to going to a primarily White institution. In addition, it helped my confidence. It helped me transition into understanding levels. Pioneer was probably the stepping stone to the revelation that I came in to college about a multitude of things. If I didn’t go there, I would have been torn apart at college.

Jackson also shared how his time at Pioneer reminded him that he belonged at college, and noted that once he got to college, he knew that “some of the kids were not as smart as some of the kids” that he met at Pioneer.

Eugene shared how his time at Pioneer “opened his eyes to how interesting chemistry is, how fun it can be, and how passionate I am about learning.” He added:

My interest [in chemistry] that I discovered there, it couldn't have hit me more in my blind spot. I really did not expect it at all. I was thinking of the craziest fortune ever that really just changed my entire trajectory.

Eugene went on to share how his academic confidence grew while he was at Pioneer:

Once I got that confidence, I started being able to keep up with the pace of things more and getting more comfortable with it and then just advancing. I felt, every trimester, it was just getting quicker and quicker. I felt like once I got the hang of that, my senior year, I could really branch out academically, and start to study a subject that I wanted to pursue in college, and that is what I ended up doing. I started to take some very ambitious science courses. I was such a hardheaded person, and I thought early on in my junior year that these were things [course] that I would stay away from. But by the time I had built up enough confidence by the end of my junior year, I thought, “Bring on the challenge.”

Keith talked about how his confidence grew from getting into all four colleges he applied to:

I was pretty happy that I, as far as when it came down to admission time, I got into all four of the schools that I applied to, and I remember at one point thinking, “Everybody who applies to CNSU from Pioneer gets into CNSU.” But I remember finding out pretty quickly that wasn't the case. We had some really, I would say students who were really

qualified, who got wait-listed, or didn't get in at all. I just remember feeling accomplished, like I came here and I had a great time, but I still did exactly what I needed to do. I mean, I got into [the] college I wanted to get into. By coming to this school [Pioneer], I'm going to get tuition paid for where I go to school, so I'm helping my family out.

One way that participants gained academic confidence was by asking for help. As Victor shared:

Pioneer made me readjust. It made me more willing to ask for help. It made me more willing to learn how to study. I had to learn on the fly, really, what studying actually meant, and what it meant to be very diligent in my work.

Although most participants were attracted to Pioneer because of the academic opportunities, they left Pioneer having matured and grown socially as well. Several participants discussed "coming out of their shell" while at Pioneer. In his interview, Victor shared how he was able to "branch out" at this "strange little school":

When I was there, we ended up taking the Myers-Briggs Inventory [Myers-Briggs Type Indicator]. I was INSJ [Introversion (I), Sensing (S), Intuition (N), Judgment (J)]. I am [a] pretty big introvert. When I was at Pioneer, I started to break that down a little bit, and allowed [myself] to venture out a bit more, simply because I was around people who were similar [to me]. Everybody was smart. Everybody kind of wanted to do well. So, kind of having that in the back of the head, I was more willing to go out a bit. I wouldn't have gone out before at my home high school. So going to dances and other things, I was more inclined to do that a bit more.

I enjoyed this strange little school. I enjoyed being able to kind of branch out a bit. I think being at Pioneer was kind of pressure cooker and that kind of broke some of

my shell that I had in high school. It changed some of my perspective on things. I was able to make some pretty good connections there, some meaningful ones.

I learned more about myself, being more willing to venture out. I think I made a couple of pretty good friends there as well, and enjoyed those social connections while I was there.

Keith talked about his positive social transition to Pioneer. He described feeling “more welcomed” at Pioneer than at his home high school:

I went to a school where I was number one in my class before I left my old high school, and it didn't really seem like something that was applauded. I didn't really feel like that there was a lot of recognition with that. At Pioneer, going somewhere where there were a bunch of people who were used to doing well and being at the top of their classes, I kind of felt more welcomed. I felt more comfortable there. I mean, we had sports, but sports wasn't the main thing going on there. I didn't really feel like there were the same type of divides and cliques as far as the arts people versus the people that were called the nerds versus the athletes. It was more than just people [who] made their friends based off either which hall they were on, or their interests, and so I really appreciated that.

Eugene talked about his social transition at the school:

I was able to get to know a lot of people on the floor through my roommate, [who] was super outgoing, really loud, [and] a great person to connect with just because they'll introduce you to a lot of other people. That's how I really started to branch out and meet other people. It is a lot of easier being introduced to the other people through my roommate.

I would say, I branched out a lot quicker than I expected. I was probably seen as a lot more of a shy person. I didn't want to be isolated or anything, but I kind of went out of my way to be friendlier to the people who I had met. That actually turned out well. I made a lot of friends doing that, which surprised me at the time.

My second year at Pioneer, it was the best that I could have ever hoped for. When I was in high school before I went to Pioneer, I really stayed at home a lot, I didn't go out, I didn't party very much, I didn't really hang out with friends outside of school too much. I would just stay home. I was kind of an introvert. I just kind of stayed to myself. I would talk to my brother and stuff, but I was mostly just on my own, in my head for most of my life, so living with other students at Pioneer is probably what I needed to be able to be comfortable for my freshman year at college, [and] throughout college, living in a dorm.

Taylor talked about his social transition from his smaller high school in a rural part of the state to a bigger city and bigger school. In his interview, he acknowledged his academic and personal growth:

I felt like I made friends easily. I had two friends from my county that went with me to Pioneer. So, I was always constantly making new friends. I made really good friends on the hall my first few weeks. And then also, because I had done the summer leadership program, I knew people coming in. There were other minority students. And then also, through my other friends, the friends that came with me from my county, I was constantly meeting new people on different halls. It was a really enriching experience. It was challenging academically, but I felt like I grew the most during my two years there. Even though I think I was in general chemistry during my junior year, I decided to

take AP chemistry and organic [chemistry] my senior year, because I knew that I could challenge myself. I had a lot of leadership roles on campus, so I felt like I really grew, not only as a student, but also as a person. I was an RLA, and I feel like that really helped me in terms of my interpersonal communication. That's something that I had always struggled with back home, and I really wanted that challenge to grow and [to] build relationships with people, and also just trying to be the best person I can be. And I feel like Pioneer really helped catalyze that transition for me from just being a teenager to an actual young adult.

In his interview, Sean shared that he grew and matured at a rate that would not have been possible at home:

I got to see a ton of different cultures, which allowed me to see the world a little bit differently and see that not everybody's like me, and people still have a lot of comments about folks that don't look like you, don't come from where you come from, and [I] made friendships that [will] last a lifetime. For me, I think I actually became more social going to Pioneer. My older siblings, one was just a grade above me; the other one was like two grades. One was really big in basketball, actually both really big in basketball, things like that. It was like I enjoyed going to school and had some friends, but I wasn't like, social. As a little bonus, Pioneer kind of created my own identity as well where I could be the person I wanted to be. Not just making fake friends and just not having like previous [friendships, like], oh this is this person's little brother. It was different than that. I was able to kind of be more social and get a lot more involved on campus, and I think that helped me a lot too. I became more comfortable and accepted and everything.

In his interview, Michael compared his experiences at Pioneer to those at the school he had previously attended. He shared that he felt like he was able to find more of a connection at Pioneer:

At my home high school, I was really removed socially. I had a very small group of friends, but we didn't eat lunch with the rest of campus. We didn't really engage in many nonacademic extracurriculars. We only really hung out with each other after school, if we did hang out after school, versus at Pioneer, I feel like when I came to Pioneer, I found a lot of people who I really connected with in a lot of different situations. I really connected with my "senior sister" during the summer before I came to Pioneer. I found some students at Pioneer that I totally looked up to. I think that was something that I didn't really have as much at my home high school.

Thomas talked about how he came "out of his shell":

The diversity of Pioneer was good. You literally meet everyone from everywhere. It was a very influential time in my life. I learned about leadership. I got involved in leadership roles that forced me out of my shell, that forced me to be more confident, that forced me to take ownership of a lot of things, and so I really just grew.

And for African American students out there, I will just say, you learn as much as you can regardless of the grade. I was able to learn, but learn for learning's sake and not for a grade. I think I just developed the thirst for learning and cared a little less about the grade. Do things that will help you find yourself and find your identity both in, whether that is your own personal history, your cultural background. Do things that will help you find your identity and be comfortable with that.

It was probably the biggest growth spurt of my life. I guess that in terms of growing into my identity, it was very influential. I think I was a very shy kid. I guess some people might still say I'm shy, but a lot of people don't say that. I think probably at the time I was very shy and I kept to myself. I was the nerdy [kid], I wouldn't say completely nerdy, but in middle school and high school, by the freshman year, I was in the honors classes; you are always in your little clique of the more academic people. But, I think because of Pioneer, everybody was like that, so you have to redefine social circles.

There is so much that goes on at Pioneer that even if you are not the super-outgoing person that seeks out something, if there is something that needs to be done, be available to serve or to do it. Growth comes from that. I think that is probably the biggest lesson that I learned. It was probably one of the most beneficial and influential lessons that I learned. In hindsight, it's come back to help me a lot, particularly in med school. I think back now and I was like, you have done this before, this has happened before, it's okay. So, I think just becoming comfortable with failure, maybe those were some of the biggest challenges, becoming comfortable with failure.

Like I was saying, at Pioneer, everyone is smart, and for me, I wasn't getting straight As anymore. I realized at Pioneer, I don't think I was ever the person that defined myself by being the straight-A student. I think I'd learned early on that there are other things than your performance, but I think that became very real and very apparent at Pioneer. So, being comfortable with that and still maintaining your confidence and your sense of sanity through all of it, those were some of the things that I learned.

This subtheme, increasing academic and social confidence, summarizes participants' reflections on the importance of their overall Pioneer experience. They recalled how they matured and developed both inside and outside the classroom. They reflected positively on their experience at Pioneer and how the confidence they developed there benefited them once they went to college. By excelling in a rigorous environment, they gained confidence that made them believe that they could have similar success in college and in their careers. In addition to increased academic confidence, participants discussed how they were able to "come out of their shell" while they were at Pioneer and become more social. They shared how their social confidence helped them transition to Pioneer throughout college and their career.

### **Summary**

Four themes emerged from analyzing the data that convey the experiences of the 12 African American male graduates' transition to and through Pioneer. All participants enrolled in college immediately after graduating from Pioneer to pursue a degree in a STEM field or major. The first theme, family influence, emerged from the narratives of the support participants received from family related to their education interests and academic pursuits. The second theme, seeking greater academic opportunities, revealed that participants were not academically challenged in the way that they needed to be in their home high school. They desired more opportunities and sought challenging courses in science and math. They recognized that Pioneer provided academic opportunities that could benefit them and assist them in the future. The next theme, adjusting to a residential math and science school, highlighted participant stories that dealt with attending a challenging and demanding academic institution. The final theme, achieving success at a residential math and science high school, described how African American males successfully transitioned through and achieved success at Pioneer and beyond.

## CHAPTER SIX: DISCUSSION

The purpose of this study was to explore the experiences of African American male alumni who graduated from Pioneer Academy, a residential state math and science school. This qualitative study was aimed at identifying the transition process for enrolling at Pioneer. Twelve African American men shared their experiences of attending and graduating from a residential math and science school. This study sought to explore what is known about the transition process for these students and to discover the positive factors that influenced their achievements in STEM. The following research question guided this study: What are the storied background, academic, and social experiences of African American males who transitioned into and graduated from Pioneer Academy? The study used narrative inquiry to gain insight into the participants' experiences. Four themes emerged as participants described their transitions to and through Pioneer Academy: (a) family influence, (b) seeking greater academic opportunities, (c) adjusting to a residential math and science school, and (d) achieving success at a residential math and science school.

This final chapter will review key lessons from the study and situate them within the existing literature. This chapter includes the implications for the theoretical frameworks that were used in this study. A review of recommendations for key stakeholders and recommendations for future research are also included. Finally, I will review the study's limitations and offer a brief conclusion.

Three major takeaways emerged as I reviewed the research question that guided this study: (a) motivation and support to attend a residential math and science school, (b) factors that contributed to a successful transition to and through a residential math and science school, and (c) importance of college preparatory experience.

### **Motivation and Support to Attend a Residential Math and Science School**

Participants in this study were highly motivated to pursue academic achievements. Participants' initial interest in STEM emerged well before they expressed interest in applying to Pioneer. Participants' motivation often began during elementary or middle school when they recognized an interest and ability in math and science. Participants' family influence and expectations also served as motivators. Additionally, participants' desire for short-term and long-term goals, including a career interest in STEM, helped motivate them to pursue a high-quality STEM education experience.

The research on African American male students in a residential math and science school is scarce. Often, the research focused on the barriers that schools faced when trying to attract minority students to their campus (Jones, 2009, 2014; Desphande, 2013). These studies highlighted barriers such as relocation resistance, lack of understanding of the school, lack of parental support, distance, and difficulty of the school. Roberts and Alderice (2015) noted that the success of the school relied on continuing to identify, market, recruit, and select talented individuals who would ultimately be motivated and encouraged to graduate. Yet, at the time of this study, there were few studies that shed any light on the factors why students chose to apply and to attend these schools. Furthermore, there was little information about the factors that led African American students to apply and to attend.

Previous research on minority student populations did not explore the reasons why they chose to apply to and attend a residential math and science school. Rather, the research focused on the difficulty that residential math and science schools faced when trying to attract and recruit minority students. This study identified factors that led high-achieving African American male students to apply to and attend a residential math and science school.

Several factors led participants to apply to Pioneer. First, participants benefited from positive support and encouragement from family members. The support participants received from family encouraged and promoted their educational interests and academic pursuits long before they considered applying to Pioneer. Participants discussed how their parents celebrated their academic successes at an early age. For example, parents encouraged participants to participate in STEM-focused summer camps or to attend an engineering school within a larger high school environment. Parental encouragement led to participants' following their strengths and developing a passion for math and science courses. As a result, participants felt supported in considering a residential math and science high school. Several participants acknowledged their parents' willingness to allow them to leave home early to attend Pioneer. Researchers have discussed the importance of family support as a key factor that assisted African American male student success in college (Bonner, 2010; Harper, 2012; Fries-Britt, 2017). This study recognizes the value of family support for the decision by African American males to apply to and attend a residential math and science school.

A second reason participants chose to apply to and attend a residential math and science school was the academic rigor and reputation of the school. Participants talked about their desire for a different challenge and to push themselves academically. Participants discussed their review of the course offerings prior to applying to the school. Participants were attracted to the unique courses and curriculum that were offered at Pioneer. Participants considered attending a residential math and science high school primarily for the academic rigor. Once at the school, academic rigor played a significant part in their experience. Participants described the culture shock of being surrounded by high-achieving peers. First, the majority of participants discussed their transition and adjustment to the rigorous academic environment. Second, participants

shared that they quickly abandoned old practices and developed new strategies in order to be successful. Third, they discussed their feelings about their transition from being top students at their home high school to “average” students at Pioneer. Participants embraced the academic challenge and ultimately adjusted to the increase in rigor. In doing so, they developed skills that assisted in their transitions to Pioneer and to college. The majority of participants discussed how their utilization of faculty office hours played a major role in their comfort with course material and with adults and helped improve their academic performance. Participants continued the habit of utilizing office hours when they went to college.

Several participants acknowledged that exposure to rigorous courses at Pioneer ultimately influenced their choice of a major in college. Some participants came to Pioneer with the idea that they would pursue a certain major in college changed their mind after positive exposure to another discipline. Keith, who majored in chemistry in college, shared how this shift “hit him in [his] blind spot.” Eric felt better prepared for an engineering major after taking courses at Pioneer. Aaron’s experience taking computer science courses at Pioneer cemented his decision to major in computer science, rationality, and thought. All participants described stories of how their experience at Pioneer impacted the major they chose in college.

Participants also acknowledged how the rigor at Pioneer prepared them for postsecondary academic rigor. Participants shared their ability “to hit the ground running” when they went to college. Several participants discussed how some of their courses in college felt easier than the courses that they took at Pioneer. Participants explained that they learned how to balance their academic schedule while at Pioneer. Additionally, participants believed they were better prepared for math and science courses as underclassmen in college. Participants had a “leg up” on their college classmates because of the quality of courses that they took at Pioneer. For some

of the who participants applied to medical school, “getting out to a strong start” as freshmen and sophomores in college was key for their medical school aspirations. They believed they got a significant boost by having attended Pioneer.

Lichten (2007) suggested that only a small percentage of the total high school student population were advanced enough to do college-level work, regardless of color. He recommended that the focus for 99% of high school students, regardless of race, should be on preparation for college while in high school (Havis, 2015). Statistics typically showed that the lack of access to rigorous courses put African American students at a disadvantage when preparing for advanced STEM courses and careers (U.S. Department of Education, 2016; McGee & Martin, 2011). The participants in this study benefited from access to college-like courses. Several participants noted that the courses at Pioneer were just as tough, if not tougher, than some of their college courses. This study reinforces the importance of a strong high school college preparatory experience as it relates to STEM.

### **Factors that Contribute to the Success of High-Achieving African American Male Students**

Faculty and staff took a personal interest in students’ academic and social development. Faculty created research and mentorship opportunities, assisted participants with their writing, discussed short- and long-term goals, and held participants accountable for their actions.

Participants in the study benefited from strong relationships with quality faculty and staff members. This finding supports research on the importance of positive interactions with teachers and staff (Grantham, 2004; Bonner, 2010; Fries-Britt, 2017). These relationships were important as participants transitioned successfully through Pioneer. Participants detailed positive and meaningful relationships with adults that made them feel welcomed and supported at Pioneer. These relationships benefited students not only while at Pioneer but also after graduation and

beyond. After dealing with the initial culture shock of attending Pioneer, participants built their support system to effectively navigate through the school. They took advantage of meaningful resources such as faculty office hours.

In addition to strong relationships with faculty and staff, participants acknowledged having received support from strong relationships with fellow African American students while at Pioneer. Despite representing less than 10% of the student population, participants found a home away from home community with their African American peers. They recognized how forming strong connections with peers assisted in their transition process. Being able to be part of an African American community was key for participants' sense of belonging. As noted by Clark (1991), the successful creation of social support systems for African American students can positively contribute to resilience and ability to be successful.

The support from a tight-knit African American peer community was another positive factor in participants' transition through Pioneer. This study aligns with previous research (Grantham, 2004; Burt, Franklin, & Fries-Britt, 2012; Moore, Madison-Colomore, & Smith, 2003; Williamson, 2010) on the importance of African American male students' developing strong relationships with faculty and peers. Participants in this study formed meaningful relationships and strong networks with their peers in order to adjust academically and socially to their environment. In the absence of a physical space on campus where they could commiserate, participants created and developed "safe spaces" by building relationships with their peers. Some of those safe spaces existed as clubs and activities such as the gospel choir or NSBE. Participants benefited from access to the African American community and participation in extracurricular activities.

Research has shown that there is a positive correlation between involvement on campus and a sense of value in relation to peers, administrators, and faculty (Harper, 2012; Moore et al., 2005; Eatmon, 2007; Coleman, 2014). When students feel they matter, they are more likely to develop a sense of belonging, which promotes persistence and graduation. Participants in this study benefited from a variety of cocurricular and leadership experiences. Participants did not only take math and science courses but also participated in athletics, research, and mentorship experiences; served as presidents and leaders of clubs and organizations; and received local, regional, national, and international recognition in academic competitions.

Participant engagement with leadership and cocurricular activities was an important component of their transition to and through Pioneer because these activities made their Pioneer experience meaningful. Although participants appreciated the academic grooming that they received at Pioneer, they were also grateful for the ability to participate in outside-the-classroom activities, which would not have been available to them in their home high school or community. In addition, participation in outside-the-classroom activities allowed participants to develop leadership skills that they could apply in college. These leadership skills complemented the academic preparation that they received and assisted in their preparation for their college experience.

### **Importance of College Preparatory Experience**

A key takeaway from this study is the importance of a true college preparatory experience. College readiness is the combination of core academic knowledge, skills, and habits that students need to be successful in a college setting without remedial coursework or training (Lombardi, Seburn, & Conley, 2011). Preparation for college is not determined solely by the

classes students take. Students are better prepared for college when they understand college culture, have strong study habits, and know how to access support (Lombardi et al., 2011).

Conley (2010) identified four elements of college readiness: (a) cognitive strategies, (b) content knowledge, (c) academic behaviors, and (d) contextual skills and awareness. Cognitive strategies are ways of thinking and processing information that are necessary for college-level work. This includes analytical skills, construction of well-reasoned arguments, evaluation of varied or conflicting perspectives, formulating hypotheses, and developing problem-solving skills (Conley, 2010). Content knowledge is the core knowledge in subject areas such as English, math, and science that provide students with the context and basis for processing more rigorous material (Conley, 2010). Academic behaviors reflect student self-awareness, monitoring, and control. To be ready for college, Conley stated that students should demonstrate ownership of the learning process by setting goals, seeking help, persisting in courses, and communicating effectively with teachers. In addition, academic behaviors include the development of skills such as time management, note taking, organization, and participation in study groups. Contextual skills and awareness refers to the specific understanding of how college operates as a system as well as culture. Conley believed that students' ability to understand expectations and how to interact with peers, faculty, and staff is critical for success. Strong contextual skills help students navigate processes such as selecting a college, navigating the application and admissions process, obtaining financial aid, and registering for classes (Conley, 2010).

Participants in this study benefited from attending and successfully matriculating through a rigorous residential math and science college preparatory experience. While at Pioneer, they were exposed to rigorous coursework. They benefited from high-level courses with quality

instruction, which prepared them for the rigor of college by increasing their content knowledge. Research has shown that students who have access to college-level academics in high school are more likely to seek and succeed in higher education (McGee, 2013; Roderick, Coca, & Nagaoka, 2011).

Research has suggested the quality of teaching students receive is the most important in-school factor affecting their achievement (Thompson, Warren, Foy, & Dickerson, 2008).

Aspects of teacher quality that influence students' ability to achieve at the high school level and demonstrate college readiness include high-level instruction in challenging courses, high expectations from teachers, and positive relationships with teachers and other school staff members (Flores, 2007; Reid & Moore, 2008). In addition to teacher quality, the relationship between teachers and students should be strong in order to encourage academic success.

Participants in this study believed that they benefited from working with high-quality faculty who cared about their overall well-being and development. Participants considered the quality of teaching and instruction that they received at Pioneer equal to the level of instruction that they received in college. They also viewed faculty members as mentors whom they could go to for advice about careers, college, and life in general.

Participants in this study developed strong academic behaviors such as time management skills while at Pioneer. They no longer relied on their parents to set guidelines for how they used their time. Participants had to ensure that they arrived to class on time, made curfew on time, allocated enough time to study to do well in their classes and manage their cocurricular activities. The high school experience for these participants mirrored the experience that most first-year college students encounter.

Participants in this study were prepared and ready to excel once they went to college. There has been little research to explore whether the experiences of residential math and science high school students prepared them well for college. Administrators at residential math and science schools have assumed that students would be academically prepared based on common metrics such as GPA, SAT scores, and college admission practices. Though those are important indicators of college readiness, this study speaks to other factors that played a significant role in their ability to succeed not only at Pioneer but also in college.

Participants built their academic and social confidence while in a college-like environment. Increased confidence played a significant role in participants' ability to "run slightly faster" than their peers once in college. Two years of experiences navigating and flourishing in a rigorous academic environment at Pioneer prepared students for college.

### **Theoretical Frameworks**

*Harper's Anti-Deficit Achievement Framework:* As mentioned in Chapter 2, Harper's anti-deficit achievement framework for studying students of color in STEM has encouraged researchers to focus on behaviors and conditions that lead to minority students' achieving success in STEM. Instead of analyzing the examples that highlight minority student failures in STEM, Harper's framework has challenged researchers to reframe their research questions into anti-deficit queries at three distinct junctures: (a) precollege socialization and readiness, (b) college achievement, and (c) postcollege persistence in STEM. Each juncture represents achievement at a particular time within the STEM pipeline: before, during, and after college. The framework has also provided three researchable dimensions of achievement for each juncture.

The researchable dimensions of achievement within precollege socialization and readiness include familial factors, K-12 school forces, and out-of-school college preparatory

experiences. The dimensions within college achievement include classroom interactions, out-of-class engagement, and experiential and external opportunities. The final dimensions within college persistence in STEM include industry careers, graduate school enrollment, and research careers. Harper (2012) identified successful coping strategies used by African American men in their college environments.

This study revealed that precollege socialization and readiness played a significant role in participants' STEM education success stories. Participants shared pre-Pioneer and Pioneer experiences that influenced their pursuit of a STEM field. In particular, participants verified the significance of family support as they considered attending a residential math and science school. Participants benefited from involved and supportive families in their educational pursuits from an early age. In addition, participants spoke at length about the support they received from encouraging faculty and staff at Pioneer. Support from parents, faculty, and staff played a significant role in students' successful transition to and through Pioneer and established a foundation for a solid college experience.

Participants benefited from a unique in-school and out-of-school preparatory experience at Pioneer. By attending a residential high school, participants were immersed in a STEM-based living-learning environment for their junior and senior years. They were introduced to a high level of academic rigor. At the same time, they adjusted to a new living situation where they matured and became more independent. Attending a residential math and science school reinforced and advanced the existing knowledge that participants had in STEM areas and fields. Successful completion at Pioneer resulted in a greater level of academic and social confidence. This applied to both in-class and outside-the-classroom experiences. Participants noted that

some of the outside-of the-classroom opportunities (e.g., NSBE) were not available to them in their home communities.

Participants in this study identified positive one-on-one experiences with who were caring and supportive. Meaningful faculty interactions and support extended beyond the classroom. Participants viewed some faculty as advocates and recognized the role they played in actively including students in the academic community. Participants also noted that developing strong relationships with faculty at Pioneer motivated their desire to do the same in college. Participants recognized the benefit from forming these relationships with faculty, which extended beyond increased academic understanding of material or improved grades. Faculty provided perspective and advice about students' short- and long-term aspirations.

Participants benefited from significant involvement in leadership and cocurricular activities that enhanced their experience at Pioneer. Participants developed greater ownership of their time while at Pioneer, which was reinforced by the residential experience. Research has shown that there is a positive correlation between involvement on campus and a sense of value in relation to peers, administrators, and faculty, which was corroborated by the findings from this study.

Using the anti-deficit achievement framework for this study enabled me to examine the participants' transition process at Pioneer. The framework prompted me to consider how participants navigated the transition process and to identify factors throughout their experience that led to their success. After linking the study findings to the framework, it is evident that, even though the participants' experience was in a high school, rather than college, setting, all three of the framework's junctures were present in participants' narratives: they discussed their experience at Pioneer (precollege socialization and readiness), their experiences at college

(college achievement), and described the next step in their career (postcollege persistence in STEM).

Participants in this study were motivated to attend a residential math and science school, pursue higher education, and pursue a STEM major or career. Participants in this study discussed their motivation to attend a residential math and science school and how that experience shaped their higher education experience. Discovering more about African American male motivation assisted me in obtaining a better understanding of their precollege and college experiences.

***Schlossberg's Transition Theory:*** Schlossberg (1995) defined a transition as any event or nonevent that results in changed relationships, routines, assumptions, and roles. Schlossberg noted that in order to understand the meaning a transition has for a particular individual, the type, context, and impact of the transition must be considered. Schlossberg identified four major sets of factors that influence a person's ability to cope with a transition: situation, self, support, and strategies (4S's).

Schlossberg (1995) defined situation as an examination of the cause for the transition, timing of the transition, level of control over the situation, duration of the transition, previous experience with similar transitions, stress during the transition, and an assessment of the transition as positive or negative. In this study, participants entered the transition for positive reasons. They were motivated to attend a residential math and science school to seek greater academic opportunities. They were not forced to apply or attend. As a result, these were anticipated transitions that participants desired. Even though the transition was anticipated, there were still challenges related to the experience of attending a residential math and science school, most notably, the adjustment to the academic rigor and diversity of the school. Participants

navigated that transition with the support of others: their family, faculty, staff, and fellow African American peers.

The timing and the length of the transition were known because participants knew they were entering the transition phase for their final two years of high school. Participants knew that their attendance at a residential math and science school was unique in comparison with other high school students. Participants communicated that they had control over their decision to attend. Several participants shared that they expressed interest in attending Pioneer and that their parents or families ultimately agreed they could attend. Participants also had control over the location because they chose to attend a specific residential high school.

Participants' primary role as students remained constant though other roles changed. For example, participants discussed their adjustment from being top students in their old high school to being among several good students at Pioneer. As participants transitioned from their junior to senior year, their role changed from new students to student leaders. In relation to previous experience with similar transitions, the transition to attending Pioneer was the first of its kind for participants. Participants shared that they benefited from the experience of the high school transition as they transitioned into and through college. Their experience at Pioneer helped make several aspects of the transition to college familiar.

Several participants acknowledged the stress they encountered when transitioning to Pioneer. Participants attributed the stress to the increase in academic rigor, responsibilities, and time management required at Pioneer. Despite these stressors, participants assessed their transition to Pioneer as positive. They anticipated and were excited to make the transition. Though there were challenges, all participants characterized their transition as positive and valuable not only for their time at Pioneer but also for later in life.

Schlossberg classified self into two primary categories: personal and psychological. Personal and demographic characteristics, such as socioeconomic status, gender, age, and race, affect how an individual views life. Psychological resources include ego development, outlook, commitment, and values. Psychological factors such as maturity, social skills, and confidence grew and developed for participants while attending Pioneer.

In this study, participants shared personal characteristics via a demographic questionnaire. Participants self-identified as African American males. The data from this study suggest that participants benefited from growing up in predominantly middle-class homes where both parents were present. In this study, 10 of 12 participants (83%) grew up in a two-parent, married-couple household. Although between 1960 and 2013, the proportion of Black children living in a single-parent home rose from 22% to 55% (Mulhere, 2015), in this study, only two participants grew up in a single-parent household with their mother. Eight participants defined their family's socioeconomic status class as middle-class whereas three defined their family's socioeconomic status growing up as lower class.

Eight participants' mothers (66%) had graduated from college with at least a bachelor's degree. This percentage is significantly higher than national averages. A 2017 study noted that 27% of Black school-age children (ages 6–18) had a mother who had obtained at least a bachelor's degree (Child Trends, 2019). Five participants' fathers (41.6%) had obtained at least a bachelor's degree, 13% higher than the national average for Black school-age children (Child Trends, 2019). In total, 10 of the 12 participants grew up in a household where at least one parent had graduated from college with a bachelor's degree. As noted by Ward (2006), parental education level is an important predictor of educational attainment and college enrollment for

their children. As reinforced by this study, parental influence played a significant role in participants' STEM journey.

Psychological factors also benefited participants in this study. Participants' academic and social confidence developed at an early age and was encouraged by their family. Families supported their interest in STEM education and often modeled positive examples of successful STEM careers and education. Several parents of participants worked in STEM fields or pursued STEM degrees, which motivated participants to do the same.

Schlossberg defined support as the resources available to people to assist with a transition, such as family, peers, coworkers, classmates, organizations, and institutions. The support that participants received while at Pioneer was significant and beneficial. Chapters 4 and 5 included stories that described the level of support that participants received before, during, and after their transition to Pioneer. First, participants received support from family to apply to and attend Pioneer. Second, several participants shared positive experiences related to summer enrichment programs connected to Pioneer. Third, participants received positive support from faculty and staff at Pioneer. Fourth, participants received valuable support from peers, especially fellow African American students. The various forms of support contributed to participants' initial and continued success.

Schlossberg's transition theory describes three types of coping strategies: responses that modify the situation; responses that control the meaning of the problem; and responses that help to manage the stress after it occurred. Participants reflected on their experiences and shared the strategies they used to effectively navigate their transition. Several participants developed new strategies to adjust to the academic rigor of the school. In addition, many sought advice from

supportive networks of peers, faculty, and staff to assist with their transition. All participants acknowledged their ability to implement positive strategies in order to manage their transition.

The findings in this study align with Schlossberg's transition theory and other studies related to student transitions. Several studies note the importance of support from family and friends (Dominick, Stevens, & Smith, 2006; Bonner, 2010; Hurtado, Carter, Spuler, Dale, & Pipkin, 1994). Both Harper's and Schlossberg's theories assisted in developing the framework for this study. Harper's framework aligned with the themes identified in this study. The four themes, identified as key components in the transition to and through a residential STEM high school, expand on Harper's focus on redefining the narrative of Black men in STEM education. Instead of focusing on the lack of Black males in STEM fields, the themes that emerged from this study highlight examples of how African American men successfully navigated and ultimately found success in STEM environments.

### **Practice and Policy Recommendations for Residential Math and Science School Faculty, Staff, and Administrators**

The findings from this study suggest opportunities to design or enhance practices to support African American male students who have an interest in STEM education. As a result of this study, I have identified several recommendations for faculty, staff, and administrators who work at a residential math and science school. The recommendations will positively impact the experiences of African American male students attending residential math and science schools.

***Communication with Family:*** Positive support from family and encouragement to undertake challenging academic opportunities motivated participants to apply to and attend a residential math and science school. Participants' families remained supportive as the students navigated a new residential living-learning environment. Given this, faculty, staff, and

administrators should embrace or develop systems to involve parents and keep them informed of their child's academic and social transition to the school during their first year. For residential math and science schools, establishing proactive monthly or quarterly meetings to discuss the academic and social transition of new students could place greater emphasis on the importance of a good adjustment to a state residential math and science school. Schools should use social media, online sessions, and occasional e-mail messages to keep families updated.

Furthermore, residential math and science schools should develop methods to keep parents informed about institutional efforts, resources, and initiatives to aid students' adjustment to the campus environment. Increased and early communication with families could provide an opportunity to share factors that typically contribute to the success of students. For example, residential math and science schools could communicate the importance of students' building strong relationships with faculty and peers and of participation in leadership opportunities. Increased awareness of resources and factors that contribute to success would allow families to then reinforce and encourage the use of additional resources earlier in a student's transition.

***Quality Curriculum:*** Another implication of this study for stakeholders relates to the curriculum. Participants were attracted to the school to take advantage of unique academic opportunities. Residential math and science schools should design coursework to challenge talented students despite the growing pains associated with the transition to a higher level of academic rigor. In addition, a strong STEM curriculum should continue to focus on a solid humanities experience for students. Some of the men in this study explained how they benefited from not only a strong foundation of math and sciences but also from a positive experience with humanities courses.

Schools should recognize the importance of support systems to provide resources and assist with students' adjustment to increased rigor. Students may experience initial difficulty in adjusting to the academic and residential environment. However, students may also develop skills such as time management and strong work ethic, which may benefit them throughout their academic career.

Another consideration for state residential math and science schools seeking to encourage increased rigor and academic exploration is the development of a pass/fail option for certain courses. Many colleges and universities provide students the option of taking a course pass/fail. Instead of a numerical or letter grade, students simply either pass or fail the class based on performance. The pass/fail option may encourage students who are concerned about the impact of a particular course's grade on their GPA or college options. This option could potentially increase the exploration of academic course options that can benefit students' secondary and postsecondary experiences.

***Cocurricular Experiences:*** Schools should encourage and provide adequate time for students to participate in cocurricular activities. Research has shown that there is a positive correlation between involvement on campus and a sense of value in relation to peers, administrators, and faculty. Participants in this study noted the importance of outside-the-classroom opportunities such as academic competitions, athletics, student government, and career-track organizations. Participation in such activities led students to develop leadership skills that benefited them both at Pioneer and in college. In addition, these experiences led to students' development of a sense of ownership in the school and a sense of belonging.

***Campus Climate:*** This study provided examples that reinforce the importance of a positive campus climate. Although participants found Pioneer to be challenging at times, they

also found support while there. The positive experiences that African American students had with their academic advisors, instructors, administrators, and residential life staff assisted in their transition to and through the school. Administrators should evaluate their campus environment to ensure that all students, not just African American males, feel a sense of belonging, which will enhance their ability to successfully transition to the school.

Increased interaction with faculty is a benefit of attending a residential environment (Curto & Fryer, 2014). Both faculty and staff at residential math and science schools should participate and engage in ongoing diversity, equity, and inclusion training to create a welcoming environment. Faculty and staff need to be aware of their own biases and work toward correcting and increasing their awareness of students' racial, ethnic, and gender identities so they do not feel marginalized. For example, faculty and staff should not assume that just because students are Black that they are poor, come from a broken home, or that their parents are not educated or invested in their education. Faculty and staff should invest time in getting to know students and realize that each student has a unique story and background.

Schools should identify best practices for assisting underrepresented minority students with their transition to their campus. Examples include peer advising and mentoring groups, forums or opportunities for underrepresented minority students to hear from faculty and staff at the beginning of the school year, and encouragement for students to take advantage of resources such as instructor office hours. Schools should also consider speaking with alumni to solicit feedback for how to implement factors that led to alumni success.

**Outreach:** Another recommendation for administrators at residential math and science schools is to expand outreach efforts. First, schools should form stronger connections with their African American male alumni. Stronger connections and more frequent conversations will

provide valuable insight for administrators about the experiences of their alumni. Former students could share factors important to their success and how their experience prepared them for college and their career.

Participants in this study were eager to share their experiences at Pioneer. They were gracious with their time and showed affinity for their alma mater. They appreciated the opportunity to tell their story. Most participants expressed interest in knowing more about the current state of affairs at the school and expressed a willingness to share their knowledge and experience with current African American students and the entire student body. Schools should take a proactive approach and follow up with young alumni, including recent college graduates. In doing so, alumni may highlight the value of their residential math and science school experience and how it impacted their college experience. Increased alumni involvement could expose current students to professional networks, potential career paths, and suggestions for how to successfully navigate their high school experience and beyond. This would require tracking and maintaining strong relationships with alumni after graduation. For current students, alumni could provide tangible examples of demonstrated success at their school.

In addition to alumni outreach, administrators at residential math and science schools should contact middle schools across their state. Just as current residential math and science school students could benefit from shared stories of alumni, middle school students and potential state residential math and science school students could be inspired by the stories of current students. Several of the males in this study participated in programs targeted toward minority students as early as middle school, taking summer courses that helped familiarize them with not only the academic rigor of the school but with being away from home. Both curricular and cocurricular experiences assisted minority students in acclimating to the school and cultivated

the opportunity to apply to and attend the school in the future. Despite the limited time frame, middle school summer outreach programs had a significant and memorable impact on participants. Furthermore, best practices for educating African American males that are utilized by residential math and science schools should be shared with middle school principals, counselors, teachers, and families in an effort to develop a stronger pipeline.

Student affairs administrators and practitioners working at residential math and science schools must come together for professional development, forums, and conferences to discuss best practices and observations from their campuses. The results from this study provide positive information about the experiences of African American males attending a residential math and science school. The information would be beneficial for similar schools across the country, specifically as it relates to the experience of African American male students. However, the data from this study are limited to one school, in one state, and one study.

College and university student affairs administrators often gather together for conferences with the goal of learning from one another. Multiple professional development opportunities exist for college administrators, and many include specializations such as orientation, housing, advising, or student activities. Regular networking and information exchanges could benefit student affairs administrators who work at residential math and science schools. For example, schools may be able to identify information related to the effectiveness of summer enrichment programs, orientation programs, participation in upper-level math and science courses, or STEM persistence once a graduate goes to college.

There are limited opportunities for student affairs administrators at residential math and science schools to discuss and brainstorm solutions to issues. In review of the consortium website, there is no indication of a formal organization for student affairs staff members to share

best practices that lead to positive experiences for students. Student affairs administrators at these state residential math and science schools should come together on a regular basis, possibly to host conferences or forums on best practices to support students at these schools. Quarterly virtual meetings could address limited financial resources. These professional development opportunities could provide a way for schools to compare their practices and identify areas of improvement

***Anti-Deficit Approach:*** Administrators should intentionally reframe goals and outcomes using an anti-deficit framework achievement approach. African American males successfully navigated to and through Pioneer and their transition processes helped prepare them for college. Academically, students recognized that they could benefit from building strong relationships with their peers. In addition to adjusting to the academic rigor of the school, participants realized that they developed and matured from attending a residential high school. They were able to have a successful transition by creating and utilizing the support systems. They were actively involved on campus and developed a sense of ownership of their experience.

The relationship between a school and its students needs to be strong in order to foster success. Faculty, staff, and students can benefit from an anti-deficit approach. Deficit perspective is damaging because it shapes the attitudes and actions of faculty and staff with students. Instead of assuming that all African American students lack motivation, family support, or effort, faculty and staff would benefit from knowing each individual student. Administrators at a residential math and science school should reframe the experience around African American male achievement. Instead of focusing on deficits, administrators should, and encourage others to, discover how African American men found success in STEM or in other

areas. Schools should embrace opportunities to highlight the success stories of current African American male students. Sharing student stories at board meetings and open houses and through external communication is one way to counter stereotypes and emphasize successes. In his framework, Harper posited that individuals who were interested in improving student success in STEM would learn a lot by inviting those who have been successful to offer insights into their success (Harper, 2010).

This study highlights the importance of social and institutional support as well as academic and social integration. Heaney and Fisher (2011) found that college students were more likely to return for their sophomore year if they believed that faculty were concerned about their success, saw a strong connection between courses and future aspirations, utilized a support service and had a good impression of the overall helpfulness of staff, and had a positive social experience during their first semester. Wolcott (2006) found that prior to the first semester, it was critical that students and their families experience programs and services that educate them about the transition to college, increase students' commitment to the institution, and help develop realistic expectations about college. Wolcott found several factors contributed to college freshmen persistence including support for social and academic integration, academic engagement, and fostering student development. In this study, participants shared stories about caring and helpful faculty and staff. They shared that they were able to find their place on campus and that they believed they were prepared for a potential career path.

### **Recommendations for Future Research**

The research from this study can expand the body of literature on successful African American males in STEM education environments. Qualitative studies like this one dive deeper into participants' academic and nonacademic experiences to share stories of successful transition

processes. The results of this study can inform educators and administrators about the factors that assist in the successful transition process for African American male students. There are several opportunities for future research that may benefit residential math and science school administrators, faculty, and staff.

In preparing for this study, I found that research on the experiences of African American male students attending a residential boarding school, specifically a residential math and science school, is limited. Further research is needed to examine the academic and social experiences of minority students at residential math and science schools. This study has shown that African American men had a successful transition process and that their experience at a residential math and science school helped prepare them for college and a STEM major or career. This study also highlighted participants' motivation to apply to a residential math and science school, their adjustment to a residential math and science school, and factors that led to their success. Additional research is needed to continue to assess the experiences of African American male students and the best ways to support them.

Further research on the transition experiences of other subpopulations would be beneficial. It is important to examine the transition experiences of other URM groups of students to see if there are commonalities among the factors that contribute to their success. In addition, it is equally important to share the success stories of other subpopulations as schools continue to diversify their communities. I also recommend a longitudinal study with participants throughout their high school and undergraduate experiences that examines the completion of a STEM degree. A research study of this nature would allow an investigation of the transition process from high school graduation through enrollment in college and provide a comparison of the two experiences. The research would permit participants to report their experiences over a longer

period of time and provide a better understanding of how they applied their experiences from high school in college. In general, increased research on residential math and science schools would expand the knowledge base of these schools. Additional research could help provide information to these schools regarding the degree of effectiveness, best practices, and areas for improvement in preparing students for college.

Research is necessary to further examine the positive experiences of African American male and underrepresented minority students at both the secondary and postsecondary levels. There is still a need to take alternative approaches in exploring the positive experiences of Black males (Harper, 2012; Bush 2014). The plight of African American males in educational settings receives much attention. Though it is important to recognize the issues associated with their plight, it is equally or more important to understand how African American males successfully navigate their educational environments. Additional research using the anti-deficit approach will provide a better understanding of the experiences of African American males in educational settings.

### **Limitations of the Study**

This study had several limitations that may have influenced the findings. Findings are specific to the participants and their experiences at one residential math and science school. Therefore, caution should be taken when applying these findings to other African American male students at this school or other residential math and science schools. My identity as an African American male administrator in a residential school setting may have influenced the way I interpreted, analyzed, organized, and presented the data. I served as the primary research instrument in the study; thus, the research was limited by my subjectivity. I was aware of my own biases throughout the study. However, other researchers with different backgrounds may

examine the same data and identify different themes based on their own positionality, biases, or experiences.

An additional and recognizable limitation of this study was the number of participants. Although the participants' stories were powerful, the sample size was relatively small. Thus, precautions should be taken when generalizing the research to the larger population. Another limitation was the time span of the study. Though focused on the participants' experiences at a residential high school, the research is limited to their reflection of their final two years of high school. In addition, the primary form of data collection was interviews. The participants self-reported their stories as they remembered them and may have left out details either intentionally or unintentionally. Finally, although the research pertaining to African American males has increased, research focused on their experiences in a residential high school is lacking. Increased knowledge of the experiences of African American males in residential high school settings may have improved the study.

## **Conclusion**

The purpose of this study was to explore the experiences of African American male alumni who graduated from a state residential math and science high school. Four themes emerged as a result of a qualitative research design that focused on the storied background, academic, and social experiences of 12 African American male alumni. Identified as key components in the transition to and through a residential math and science high school, these themes included the importance of family influence, a desire to seek greater academic opportunities, adjusting to a residential math and science high school, and achieving success at a residential math and science school. Participants reflected positively on their experience at a

state residential math and science school and credited their experience at the school to their level of success in STEM in college and beyond.

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**APPENDICES**

## APPENDIX A: CODEBOOK EXCERPT

Participant	Code #	1st Level Code (Narrative)	2nd Level: (Code)	3rd Level Code (Patterns)	4th level (Theming in Data)	Item/stories
Jackson#006	J17	I was not prepared for the level of vigor, I was not prepared for the level of depth	Culture shock/Eye-opening experiences	Increase in academic rigor	Adjusting to a residential math and science school	So, no I was not prepared. I was not prepared for the level of vigor, I was not prepared for the level of depth. That was different. I think I took a pre-calculus class in my home high school and I took it again at Pioneer and I did not do well. And this is in a class I already took. I just didn't understand, it was like another approach. It was like taking a bigger picture look at what you're learning. I was not prepared. I would just say, I was not. I was also not ready to really write good essays. I would also say the humanities are a very important part of Pioneer, and my high school.

## APPENDIX B: SAMPLE LETTER

### Letter to Pioneer Academy African American alumni interested in participating in the study.

Date  
Name

Dear (Name),

Thank you for volunteering to participate in my study. My name is Terry Lynch and I am a doctoral candidate in the Higher Education Administration program at North Carolina State University. You may contact me with any questions at [tblynch@ncsu.edu](mailto:tblynch@ncsu.edu) or by calling me on my cell phone.

For my dissertation research, I am exploring the academic and social experiences of African American male alumni who graduated from Pioneer Academy, a residential STEM high school. The title of my research is *The Stories of African American Male Alumni at a State Residential Math and Science School: A Narrative Case Study*. The Principal Investigator is my advisor, Joy Gayles, PhD, Associate Professor, North Carolina State University.

To participate in this study, you will need to fill out a demographic questionnaire via an online site in early to mid-September. This should take no longer than 15–20 minutes to complete.

To begin the process, you will be asked to complete a consent form and provide general demographic information. Both of these forms will be emailed back to the researcher. You will only need to provide information for which you are comfortable. You will also select a pseudonym, and your real name will not be released to anyone.

In mid to late September, I will ask that you participate in a 50–60 minute interview, which will be conducted remotely. The interview will be recorded and transcribed. The transcriptions will be kept secure and confidential.

After the interview, you will have the ability to complete an autobiographical timeline worksheet electronically. All autobiographical timelines will be kept secure and confidential. In addition, you will be sent a link to an online journal and you will have access to the online journal for three weeks after your interview. All online journals will be kept secure and confidential. The researcher will be the only one with access to the data.

All information collected will be kept confidential and secure. The data collected will be analyzed and reported as a part of my dissertation. A summary of the results will be available upon request.

I look forward to hearing from you if you have additional questions, or that you are willing to participate.

Sincerely,

Terry Lynch  
Doctoral Candidate  
North Carolina State University  
tblynch@ncsu.edu

Joy Gayles, PhD  
Principal Investigator & Professor  
North Carolina State University  
School of Education  
jggayles@ncsu.edu

## APPENDIX C: ONLINE DEMOGRAPHIC SURVEY

### **The Stories of African American Male Alumni at a State Residential Math and Science School: A Narrative Case Study**

#### **Demographic Questionnaire**

- 1: What is your gender?
- 2: What your race?
- 3: What is your age?
- 4: Where do you live?
- 5: Where did you live prior to attending Pioneer Academy?
- 6: What year did you graduate from Pioneer Academy?
- 7: What undergraduate school do you/did you attend?
- 8: Did you attend a four-year college or university (y/n)?
  - If answer is yes, what year did you complete, or expect to complete an undergraduate degree?
  - If answer is yes, what was your major?
  - If answer is yes, are you currently enrolled at a four-year school?
  - If answer is yes, have you declared a major?
  - If answer is yes, what is your declared major?
- 9: Did you attend graduate school (y/n)?
  - If answer is yes, what school did you attend for graduate school?
  - If answer is yes, what graduate degree program were you enrolled in?
  - If answer is yes, what year did you complete, or expect to complete, your graduate degree?
- 10: Did you receive a doctoral degree?
  - If answer is yes, what school did you attend for your doctoral program?
  - If answer is yes, what was your doctoral field of study?
- 11: Please describe your family structure growing up:
  - Married couple or two-parent family
  - Guardian(s) (e.g., grandparents, foster parents)
  - Family with female head of household, no spouse present
  - Family with male head of household, no spouse present
- 12: What was the highest educational attainment of your mother/guardian (Guardian 1)

Doctorate or professional degree  
Master's Degree  
Bachelor's Degree  
Associate's Degree  
Some college  
High school diploma or GED  
No high school diploma  
I don't know

13: What was the highest educational attainment of your father/guardian (Guardian 2)

Doctorate or professional degree  
Master's Degree  
Bachelor's Degree  
Associate's Degree  
Some college  
High school diploma or GED  
No high school diploma  
I don't know

14: How you describe your family's socioeconomic status while you were growing up?

A: Lower class  
B: Middle class  
C: Upper class  
D: Affluent

## **APPENDIX D: ONLINE REFLECTION JOURNAL**

### **Online Reflection Journal**

The purpose of this journal is to provide a platform to encourage you to continue to reflect on your Pioneer Academy experiences after our interview. Some of the prompts were asked during the interview. Please describe any significant experiences, relationships, or opportunities that impacted your experience at Pioneer Academy. Please feel free to use as much space as you would like.

You are encouraged to participate and submit the reflection journal within three weeks of your interview.

If you have any questions or concerns, please feel free to contact Terry Lynch at [tblynch@ncsu.edu](mailto:tblynch@ncsu.edu).

### **Pre-Pioneer Academy Experiences**

What was your motivation to apply and go to Pioneer Academy?

### **Pioneer Academy Academic Experiences**

Describe your academic experiences at Pioneer Academy:

### **Pioneer Academy Social Experiences**

Describe your social experiences at Pioneer Academy:

### **Pioneer Academy Relationships with Peers**

Describe your relationships with fellow Pioneer Academy students:

### **Pioneer Academy Relationships with Support Team Members (e.g., Counselor, Student Life Instructor, Advisor)**

Describe your relationships with support team members at Pioneer Academy:

**Post-Pioneer Academy Education Experiences**

In what ways did attending Pioneer Academy impact your college experience?

**Post-Pioneer Academy Career Experiences**

In what ways did attending Pioneer Academy impact your career?

**Advice for Current Pioneer Academy Students**

What advice would you have for a current student attending Pioneer Academy? What advice would you have for a current African American male student attending Pioneer Academy?

**Section to provide any additional information that you would like**

## **APPENDIX E: INTERVIEW PROTOCOL**

### **The Stories of African American Male Alumni at a State Residential Math and Science School: A Narrative Case Study**

#### **Proposed Individual Interview Protocol**

Participant's Pseudonym:

Researcher/Interviewer:

Scheduled Time:

Type of Interview:

Place:

Date:

Start Time:

End Time:

#### **Introduction/Overview of Study**

#### **QUESTIONS**

1. What was your motivation to apply and go to Pioneer Academy?
2. Describe your family's role in your interest in STEM? Pioneer Academy?
3. How did your family help to nurture your interest in STEM before Pioneer Academy?
4. How did you find out about Pioneer Academy?
5. Tell me about your Pioneer Academy experience?
6. Tell me about your greatest challenge as a student at Pioneer Academy and how did you overcome that challenge?
7. Tell me about your academic transition to Pioneer Academy?
  - a. Did you feel academically prepared during your first trimester/semester at Pioneer Academy?
  - b. Tell me about your experience with faculty at Pioneer Academy?
  - c. In what ways did the opportunities at Pioneer Academy help you build your academic confidence?
  - d. What did faculty do to encourage your Pioneer Academy and college aspirations?
8. Tell me about your experience support team (e.g., counselor, advisor, SLI) at Pioneer Academy?
  - a. In what ways did you receive help from someone at the school related to college search, application, and choice processes?

9. How would you describe your level of involvement at Pioneer Academy?
10. Tell me about your residential hall experience at Pioneer Academy?
11. Tell me about your social transition to Pioneer Academy?
12. Describe what it is like to be an African American male student at Pioneer Academy?
13. How did you negotiate being an African American male at Pioneer Academy?
14. Tell me about your greatest accomplishment as a student at Pioneer Academy?
15. What metaphor would you use to describe being an African American male at Pioneer Academy? Why?
16. What symbol would you use to describe your experience at Pioneer Academy? Why?
17. What song would you use to describe your experience at Pioneer Academy? Why?
18. In what ways did attending Pioneer Academy impact your college experience?
  - a. Academic
  - b. Social
  - c. Major Selection
19. What advice would you have for a current student attending Pioneer Academy? What advice would you have for a current African American male student attending Pioneer Academy?
20. Are there any last thoughts that you may want to share regarding any of the topics that we have discussed so far?

## APPENDIX F: CONSENT FORM

**Project Title:** The Stories of African American Male Alumni at a State Residential Math and Science School: A Narrative Case Study

**Researcher(s):**

Terry Lynch  
Doctoral Candidate  
North Carolina State University  
tblynch@ncsu.edu

Joy Gayles, PhD  
Advisor, Professor, PI  
North Carolina State University  
jggayles@ncsu.edu

**Introduction:**

You are being asked to take part in a research study conducted by Terry Lynch for completion of a dissertation under the supervision of Dr. Joy Gayles in the School of Education at North Carolina State University. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate, or to stop participating at any time without penalty. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form, it is your right to ask the researcher for clarification or more information. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

You are being asked to participate because you are an African American male who graduated from the Pioneer Academy between 2006 and 2016. Up to 12 alumni will participate in this study. Please read this form carefully and ask any questions you have before deciding whether to participate in the study.

**Purpose:**

The purpose of this study is to explore the experiences of African American male alumni who graduated from Pioneer Academy, a residential STEM high school. This qualitative study is aimed at identifying the transition process involved with attending Pioneer Academy and to learn more about your academic and social experiences at Pioneer Academy. Participants in this study will contribute to a greater understanding of how African American male students navigated their experience at Pioneer Academy.

**Procedures:**

If you agree to participate in this study, you will be asked to complete a demographic questionnaire. After completion of the demographic questionnaire, the researcher will contact you to arrange a time to conduct a 50–60 minute individual interview. The interview will be recorded and transcribed. The transcriptions will be kept secure and confidential.

During a three-week time period after the interview, participants will have the ability to complete a worksheet to provide an autobiographical timeline. The purpose of the autobiographical timeline is to provide each participant the ability to visually place important experiences in their academic and personal life.

During a three-week time period after the interview, participants will have access to an online reflection journal. The purpose of the online reflection journal is to provide participants time to reflect back on the interview and to add any additional thoughts or feedback. You will have time to review your journals and submit any correction to the researcher.

**Risks/Benefits:**

The probability and magnitude of harm or discomfort anticipated in the research are no greater than ordinarily encountered in everyday life. However, you may feel discomfort talking about specific experiences during this study. A synopsis of the findings of the study will be provided to all participants who may benefit from learning about the experiences of their fellow alumni. This study will contribute to a greater understanding of African American male student transitions into and through a residential STEM high school experience. Please note: There are likely no direct benefits to the participants.

**Compensation:**

There is no compensation involved in this study.

**Confidentiality:**

As the researcher, I am committed to protecting the confidentiality of the participants in this research study. All participants will be assigned a pseudonym. All information collected that identifies individuals will be kept safely secured by the researcher.

All of the data collected including consent forms will be stored and locked in a secure file cabinet in my office that only I will have access to. In addition, all digital recordings and journal entries will be kept secure by me and destroyed upon completion of the dissertation process. The audio recordings of the interviews will be transcribed by a professional.

Informed consent forms and data will be stored separately. All data will be destroyed within three years of completion of the study.

**Voluntary Participation:**

There is no penalty for anyone who wishes not to participate. Participating is completely voluntary, and you have the right to terminate your involvement at any time for any reason. If you do not want to be in this study, you are free not to answer any question or to withdraw from participating at any time without penalty.

**Questions:**

If you have any questions about this research study, please feel free to contact the researcher, Terry Lynch, or the faculty advisor, Dr. Joy Gayles, at the contact information listed below:

Researcher:  
Terry Lynch  
Doctoral Candidate  
North Carolina State University  
tblynch@ncsu.edu

Faculty Advisor:  
Joy Gayles  
Professor  
North Carolina State University  
jggayles@ncsu.edu

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact the NC State IRB office via email at [irb-director@ncsu.edu](mailto:irb-director@ncsu.edu) or via phone at 919-515-4514.

**Consent to Participate**

“I have read and understand the above information. I have received a copy of this form. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled.”

**Subject's Name (Printed)** \_\_\_\_\_**Date** \_\_\_\_\_**Subject's Signature** \_\_\_\_\_**Date** \_\_\_\_\_**Investigator's Signature** \_\_\_\_\_**Date** \_\_\_\_\_