

APPROVAL SHEET

Title of Dissertation: Retaining students of color in a teacher education program

Name of Candidate: Anthony T. Lane
Doctor of Philosophy, 2019

Dissertation and Abstract Approved:



Mavis Sanders, PhD
Professor
Department of Education

Date Approved: 7/25/19

ABSTRACT

Title of Document: RETAINING STUDENTS OF COLOR IN A
TEACHER EDUCATION PROGRAM.

Anthony Thomas Lane, Ph.D., 2019

Directed By: Mavis Sanders, Professor, Education

The large and persistent diversity gap between teachers and students in public schools in the United States has been linked to differences in educational outcomes for students of color. Closing this gap will require a broad effort focused on the recruitment and preparation of teachers of color, and also on the retention of these teachers once they enter the teaching workforce. To advance the former of these goals, this mixed methods study investigated the experiences and academic persistence of students of color who began coursework in the teacher education program at a public research university. Specifically, data provided by the university's department of Institutional Research, Analysis, and Decision Support were used to identify factors influencing the progress of a cohort of students from initial coursework in education to completion of the teacher certification program. To supplement this quantitative data, semi-structured focus groups and individual interviews were conducted with 12 alumni of color, eight of whom completed the teacher certification program and four who did not.

The quantitative analysis revealed that even when controlling for gender, academic background, and student support, race/ethnicity played a significant role in

determining the likelihood of students completing the education program. That is, African American/Black and Hispanic students were less likely than Asian and White students to complete education program requirements (although race/ethnicity did not predict their completion of bachelor's degrees at the university). Focus groups and interviews provided an additional layer of detail and insight. Alumni faced a range of obstacles and challenges in the program and yet spoke, almost without exception, about being motivated to become teachers out of a desire to “make a difference” in the lives of children.

The findings from this exploratory study highlight the need for intentional, multi-dimensional recruitment and retention policies and practices to address the current diversity gap in teacher preparation and the field of education. The study also underscores the need for additional research that explores the experiences of teacher candidates of color, and the conditions and supports that influence their progress, across a range of education programs and universities.

RETAINING STUDENTS OF COLOR
IN A TEACHER EDUCATION PROGRAM

By

Anthony T. Lane

Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, Baltimore County, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2019

© Copyright by
Anthony T. Lane
2019

Acknowledgements

I would like to thank my family, friends, and UMBC colleagues for their support and encouragement as I worked to complete this study. I am grateful to my advisor, Dr. Mavis Sanders, for guiding me through this process, sharing her wisdom, and always conveying enthusiasm for this research. I am inspired by the example she sets as an educator, researcher, and advocate. She and the other members of the committee—Drs. Bob Carpenter, Lauren Edwards, Chris Curran, and Jessica Shiller—provided a range of valuable insights. A special thanks to Dr. Curran for his patient assistance with technical aspects of the quantitative analysis.

I am fortunate to work at a university that is committed to investigating and addressing the issues underlying this study. Dr. Freeman Hrabowski is a tireless champion for his students and colleagues, and I have benefited over the course of eight years working in his office from his capacity and drive to help others achieve. He, along with other colleagues in the Office of the President and across the university, supported and assisted with this work. I am grateful to Connie Pierson and Mike Glasser for their patience and expertise in working to provide access to the institutional data used in this analysis.

Finally, I could not have made it to this point without the love and support of my family. I benefited from growing up in a home with parents, Geoff and Carole Lane, who believe deeply in the importance of education. Throughout this latest academic endeavor, my wife, Abby, has been a staunch ally and partner. Ultimately, she and our son, Haven, gave me the strength to see this work through.

Table of Contents

Acknowledgements.....	ii
Table of Contents.....	iii
List of Tables	v
Chapter 1: Introduction.....	1
1.1 Overview of the Literature.....	3
1.1.1 The Diversity Gap and a Teacher Shortage	3
1.1.2 Teacher Diversity and Student Achievement	6
1.1.3 Students of Color and University-Based Teacher Preparation Programs....	7
1.1.4 Social Transformation Theory of Change.....	12
1.2 Methods.....	13
1.2.1 Research Design.....	13
1.2.2 Setting	14
1.2.3 Participants and Data Collection.....	16
1.2.4 Data Analysis	17
1.3 Policy Significance	19
Chapter 2: Literature Review.....	21
2.1 The Diversity Gap and the Teaching Workforce	24
2.1.1 The Diversity Gap: Size and Origins	24
2.1.2 A Shortage of Teachers.....	26
2.1.3 Reasons for the Gap (1): Underrepresentation at All Levels	31
2.1.4 Reasons for the Gap (2): Supply & Demand	35
2.1.5 Public Service Motivation and the Teaching Profession	40
2.1.6 Students of Color and the Decision to Become a Teacher.....	43
2.2 The Importance of Teacher diversity	47
2.2.1 Fairness and Democratic Values.....	47
2.2.2 Representative Bureaucracy.....	49
2.2.3 Teacher Diversity and Student Outcomes.....	53
2.3 Preparing Students of Color to be Teachers	68
2.3.1 Educating Teachers.....	68
2.3.2 Teacher Education Programs and Diversity	71
2.3.3 Preparing Teachers of Color	75
2.3.4 Programs Focused on Producing Teachers of Color.....	80
2.3.5 Institutional Change	89
Chapter 3: Methods.....	92
3.1 Research Design.....	92
3.2 Setting	95
3.3 Participants and Program Details.....	98
Quantitative.....	99
Qualitative.....	102
3.4 Data Collection	104
Quantitative.....	104
Qualitative.....	106
3.5 Data Analysis	108
Quantitative.....	108

Qualitative.....	114
Chapter 4: Results	117
4.1 Quantitative Results	117
4.1.1 Completing the Program	117
4.1.2 Basic Regression Results	123
4.1.3 A Closer Look at Race/Ethnicity and Gender.....	128
4.1.4 Interaction Effects	130
4.1.5 Quantitative Highlights	133
4.2 Qualitative Results	134
4.2.1 Deciding to Teach	135
4.2.2 Program—Positive Experiences	143
4.2.3 Program—Challenges	147
4.2.4 Leaving the Teacher Education Program.....	154
4.2.5 Suggestions	156
4.2.6 Qualitative Highlights	161
4.3 Summary of Key Findings	162
Chapter 5: Discussion	164
5.1 Patterns of Persistence in a Teacher Education Program.....	165
5.2 Diversity and Teacher Preparation.....	169
5.2.1 Timing of Decision	170
5.2.2 Motivation.....	171
5.2.3 The Experiences of Students of Color in a Teacher Education Program	173
5.2.4 Supporting Students	174
5.3 Policy Significance	175
5.3.1 Institutional Change	176
5.4 Limitations	179
5.5 Future Research	184
Appendix A: Focus Group / Interview Protocol	187
Bibliography	188

List of Tables

Table 2.1: Programs focused on producing teachers of color.....	86
Table 3.1: Race/ethnicity and gender of UMBC Sherman scholars, 2007-2018.....	98
Table 3.2: Introductory and significant courses for different education pathways at UMBC.....	100
Table 3.3: Sample demographics.....	101
Table 3.4: Characteristics of qualitative study participants.....	103
Table 3.5: Sample characteristics.....	112
Table 3.6: Codes and sub-codes used in qualitative analysis.....	116
Table 4.1: Characteristics of program completers who started as freshmen.....	118
Table 4.2: Characteristics of program completers who started as transfer students.....	120
Table 4.3: Characteristics of MAT program completers.....	121
Table 4.4: Major subjects of undergraduate degree completers, by matriculation type and program completion status.....	122
Table 4.5: Regression estimates for undergraduates and MAT program students...	124
Table 4.6: Regression estimates for freshmen and transfer students.....	126
Table 4.7: Program and degree-completion estimates for students grouped by URM status and gender.....	129
Table 4.8: Program completion estimates for URM and White students.....	131
Table 4.9: Program completion estimates for URM and White freshmen and transfer students.....	132

Chapter 1: Introduction

Researchers and policy makers have long been aware of a large and persistent diversity gap between students and teachers at the nation's public schools. Students of color became the majority inside these classrooms as early as 2013, and yet people of color hold only about 20% of public school teaching positions (U.S. Department of Education, 2016a; Boser, 2014). Troubled by mounting evidence that this mismatch contributes to gaps in academic achievement for certain groups of students (Gershenson et al., 2017; Yarnell & Bohrnstedt, 2018; Egalite, Kisida & Winters, 2015), state and local officials, and educators at a number of school systems and universities across the country have developed specialized cohort-based programs focused on recruiting students of color and preparing them to be effective teachers (Lau, Dandy & Hoffman, 2007; Ukpokodu, 2015; Villagomez et al., 2016). While some have reported success, only a handful of these programs exist. Many, if not most, students of color with an interest in teaching pursue their degrees at any of the hundreds of other colleges and universities across the country that offer teacher training and lack such programs. Little is known about the experiences of these students as they begin taking education coursework and consider whether to complete their training and enter the profession. Drawing on data collected from students of color at the University of Maryland, Baltimore County (UMBC), a mid-sized public research university, the present study fills this gap through a mixed-methods case study focused on the following research questions.

- i. What factors are associated with students of color at a public research university completing or leaving a teacher education program?

- ii. How do teachers of color who earned their teaching certification at a public research university describe the experiences that they believe contributed to their persistence in the program?
- iii. How do teachers of color who earned their teaching certification at a public research university describe the challenges, if any, that they encountered while enrolled in the program?
- iv. How do students of color who started, but did not complete, the teacher education program at a public research university describe their experiences in the program and their decision not to continue?

This exploratory study focuses specifically on students of color who demonstrate an interest in teaching by enrolling in one or more education courses in either the undergraduate or Master of Arts in Teaching (MAT) programs at UMBC. Administrative data were used to examine student persistence in the university's education programs and possible differences among students of different racial and ethnic groups. Factors associated with persistence in the education programs and attainment of certification were identified through semi-structured interviews and focus groups exploring students' experiences, motivations, and aspirations as they started education coursework and made decisions about whether to continue.

Narrowing the teacher diversity gap, or limiting its growth, will require a range of strategies informed by the insights and experiences of people of color at multiple stages on the path toward a teaching career. Completion of an accredited certification program is one of the critical steps on that path. Understanding the factors leading some potential teachers of color to continue onward while others shift to other careers will inform discussions regarding the approaches that are needed to transform college campuses and teacher certification programs.

1.1 Overview of the Literature

1.1.1 The Diversity Gap and a Teacher Shortage

According to the National Center for Education Statistics (U.S. Department of Education, 2016a), students of color accounted for 41% of those enrolled at K-12 public schools in 2003 and 50% in 2013, and they are projected to account for 54% the students enrolled at public schools in 2025. More broadly, the country's shift toward greater diversity is apparent in U.S. Census Bureau data showing that the country's newborns became "majority minority" in 2013 and in projections that the country as a whole will cross this threshold in coming decades (Cohn, 2016; Poston & Saenz, 2016).¹

The racial makeup of the nation's public school teaching workforce is changing much more slowly. In 1987-88, 86.9% of teachers in these schools were White, and that dropped only to 80.1% by 2015-16 (U.S. Department of Education, 2017a). In all, the country had about 3.8 million public school teachers in 2015-16; the remaining 19.9% was comprised primarily of teachers who were Hispanic/Latinx (8.8%), Black (6.7%) and Asian (2.3%). The Center for American Progress calculated the difference between the percentage of non-White teachers in each state and the percentage of non-White school-age residents living there to provide a "diversity index" (Boser, 2014). This gap ranged from a low of 4 in Vermont, where the 97% White teaching force is nearly matched by a 93% White populace, to a high of 44 in

¹ While the U.S. Census Bureau has projected that Whites will drop below 50% of the population in 2044, Stein and Van Dam (2018) calculate that recent changes in Federal immigration policy could delay the crossover by up to five years.

California, where the 71% White teaching force works with a 27% White student-age population. The gap is only slightly smaller in Maryland, where the teaching workforce is 83% White and the student-age population is 43% White.

Underlying this teacher diversity gap are various societal changes over the past several decades resulting from legislation, court decisions, shifting attitudes, and emerging technologies. Before the 1954 *Brown v. Board of Education* Supreme Court decision declaring school segregation unconstitutional, teaching was one of the foremost professional career options for African Americans, and particularly for African American women. Collier (2002) notes that half of all African American professionals in 1950 were classroom teachers. While the *Brown* decision is widely regarded as a civil rights victory, 38,000 Black teachers in 17 states lost their jobs in the next decade as districts decided who would stand in front of newly integrated classrooms (Holmes, 1990). Tillman (2004), examining changes in the teaching profession following *Brown*, notes that another 21,515 teachers left teaching from 1984-89 because of new certification requirements, and argues that these changes as a whole had a negative impact on Black children as they reduced the likelihood of their being taught by teachers who cared about their “social, emotional, and academic success” (p. 299).

The Civil Rights Act of 1964 further altered the teacher recruitment landscape by opening up opportunities for women and people of color in business, the health professions, engineering, and other fields (Carter & Wilson, 1993). Villegas and Davis (2007) note that the legislation effectively drained a “captive pool” of talented

individuals who might otherwise have claimed spots in teacher education programs and then entered the profession.

News of teacher shortages, particularly in math, science, bilingual education, and special education, has become common in recent years as the economy rebounded from the recession of 2008 and school districts, which had cut the teaching workforce by tens of thousands of positions, shifted back into hiring mode (Sutcher, Darling-Hammond & Carver-Thomas, 2016). Now public school enrollment is projected to increase, and along with it the demand for teachers, at a time when many teachers are leaving the profession, often because they are dissatisfied with teaching conditions, and teacher education programs are seeing declining enrollments (Sutcher, Darling-Hammond & Carver-Thomas, 2016).

This teacher shortage is the backdrop to efforts aimed at increasing the diversity of the teaching workforce. Focusing just on numbers, closing the teacher diversity gap would require the replacement of about 1,000,000 White teachers with an equal number of primarily Black and Latinx teachers, according to calculations by Putman and colleagues (2016). Complicating matters is evidence that teachers of color have higher turnover rates than White teachers, a finding related to their disproportionate placement in high-poverty, highly diverse schools, many of which have high turnover rates as a result of poor working conditions and limited resources (Sutcher, Darling-Hammond & Carver-Thomas, 2016; Ingersoll and May, 2011).

1.1.2 Teacher Diversity and Student Achievement

In addition to raising basic concerns about equity and social justice, the existence of this teacher diversity gap is troubling given persistent gaps in student achievement by race, ethnicity, gender, family background, and other social factors. Education researchers have found evidence that students of color, particularly Black and Latinx students, may benefit from a more representative teaching force as a result of receiving less frequent and severe disciplinary penalties, an increased likelihood of assignment to gifted programs, a reduced likelihood of misplacement in special education programs, and improved educational outcomes (Grissom, Kern & Rodriguez, 2015). Gershenson and colleagues (2017), for example, found evidence of long-term academic benefits for Black children exposed to Black teachers in primary school, estimating a 39% reduction in the high school dropout rate for young Black men who had at least a single Black teacher during their early schooling. Education researchers have proposed various mechanisms through which students of color may benefit from exposure to teachers of the same race, including their availability as role models, their appreciation of shared perspectives and experiences, and the greater likelihood that teachers of color may enter the profession out of a motivation to “make a difference” in the lives of disadvantaged students (Liu, 2008; Villegas & Irvine, 2010; Dee, 2004). Gershenson, Holt and Papageorge (2016) also present evidence that Black teachers are more demanding of Black students than are White teachers.

To understand the undersupply of teachers from certain minority groups—Black/African American, Hispanic/Latinx, and Native American/Alaska Native—

many education researchers have focused on their experiences and persistence at both the pre-K-12 and postsecondary levels. They have investigated the experiences teachers of color have in the classroom (Achinstein and Aguirre, 2008) as well as the types of opportunities available to them in schools (D'Amico et al., 2017). While some studies present evidence of hiring discrimination and other challenges on the demand side, many others emphasize factors contributing to the relative undersupply of teachers of color (D'Amico et al., 2017).

1.1.3 Students of Color and University-Based Teacher Preparation Programs

Efforts to produce more teachers of color may have to contend with negative perceptions of teachers, the teaching profession, or the educational system held by some students of color. Gordon (1994) interviewed 140 teachers of color in three states to explore reasons they believed students of color were not attracted to teaching as a career; among the explanations were students' negative educational experiences, the limited availability of role models, and a general low regard for the teaching profession in their communities. Nearly two decades later, Graham and Erwin (2011), in a qualitative study of 63 young Black men who were juniors at North Carolina High Schools, reported that 59% of the words used by participants to describe teachers were negative and that many considered schools to be oppressive.

Sleeter and Thao (2007) argue that limited interest among students of color in becoming teachers may result from limited “social, economic, peer, and personal support” (p. 5). Students of color who nevertheless develop an interest in teaching may then have negative experiences in teacher preparation programs that reflect

“mainly Euro-American values and perspectives” (Sleeter and Thao, 2007, p. 5).

Despite such experiences, some students of color persist in their studies and become teachers. Those who do often report they are motivated by a strong desire to make a difference in the lives of young people (Achinstein et al., 2010; Villegas & Irvine, 2010; Dixon and Dingus, 2007). Miller and Endo (2005) used an open-ended survey and interviews to explore the motivations of eight students of color in a teacher education program; most participants reported they had such motivations, and many said they decided to become teachers only after beginning college. The researchers argue that successful efforts to recruit students of color to teacher education programs will rely on identifying students with these intrinsic motivations. Achinstein and colleagues (2010) argue that evidence of such humanistic motivations suggests that policies and programs aimed at producing more teachers of color could benefit both from emphasizing the service aspect of teaching and creating opportunities for would-be teachers to work with students of color.

Providing additional empirical evidence for such arguments, a limited number of small, mostly qualitative, studies have explored the attitudes, aspirations and experiences of students of color in master’s-level teacher preparation programs. Canty (2016), for example, conducted interviews and field observations with five students of color enrolled in a four-semester teacher preparation program at a large, predominantly White research university in the Pacific Northwest. Participants reported feeling isolated at times as they completed their coursework, and seem to have benefited from school placements while completing the program in settings that reflected their own cultural and linguistic backgrounds. Nearly two decades earlier,

Guyton, Saxton and Wesche (1996) reported similar findings in a study that explored the experiences and aspirations of five students of color and two White students in a master's level early childhood education program. Participants, including both students of color and White men, reported feeling isolated as they pursued coursework, and many reported feeling more comfortable with school placements in urban settings, where they seemed to feel that their own differences "...were less noticeable because there were so many differences among students" (Guyton et al., p. 648).

Also focusing on master's level teacher candidates, Su (1997) used a survey and interviews to look at prospective teacher's attitudes about teaching and motivations to pursue it as a career. Her sample included 90 White students and 58 students of color—primarily Asian and Hispanic / Latinx—enrolled in a one-year master's program at a large public research university in California. While prospective teachers of all races expressed similar opinions that "good" teachers care about students as individuals and are committed to their success, about a third of the students of color added an additional note of moral responsibility to their responses, suggesting good teachers also worked to improve society and inspire students from all backgrounds (Su, 1997). Su makes no mention of any participants in the study not completing; interestingly, 57% of students of color reported that their enthusiasm to become teachers increased while enrolled in the program, compared to 38% of White students.

While this last result offers some encouragement, it's unclear to what extent it reflects differences in students' enthusiasm about the profession before entering the

program or particular aspects of their experiences in a relatively large and diverse teacher education program. (Su cautions that the findings from the study may have limited generalizability owing to this aspect of the program, which went from 20% students of color in 1988 to 40% in the fall of 1993, and greatly exceeded the average at the time of about 10% students of color in teacher training programs across the country.)

In any case, Su (1997), Guyton and colleagues (1996) and Canty (2016) focus exclusively on master's level students as they examine potential teachers' motivations, perceptions and aspirations. Unlike this study, they spend relatively little time exploring the types of experiences associated with students persisting in a teacher preparation program or changing course. Several studies that examine the production of teachers of color at the undergraduate level do so in the context of developing programs focused on recruiting and supporting students of color. Bennett, Cole and Thompson (2000), for instance, note that traditional teacher education programs are geared to prepare graduates—many of them young White women from middle-income families—to teach students from racially and socioeconomically diverse backgrounds. That such programs may do a poor job preparing students of color to be effective teachers served as part of the motivation for the authors' work establishing a program at Indiana University focused on recruiting and supporting would-be teachers of color. The university's Project TEAM (Transformative Education Achievement Model) operated for several years beginning in 1996 and provided scholarship support, mentoring opportunities, and a supportive community to cohorts of about 15 students (Bennett, 2002).

While Project TEAM is no longer active, other universities, as well as school district and nonprofit organizations are trying to narrow the diversity gap by developing programs and initiatives aimed at producing effective teachers of color (Lau, Dandy & Hoffman, 2007; Ukpokodu, 2015; Flynn et al., 2015). While these programs vary in focusing their recruiting efforts on high school students up to working professionals, many are built on a cohort model in which potential teachers are provided with varying degrees of financial, academic, social, and emotional support as they proceed along the path toward teacher certification (Ukpokodu, 2015). A number of these initiatives have reported encouraging results, with many alumni becoming teachers and reporting strong commitment to the profession (Lau, Dandy & Hoffman, 2007; Ukpokodu, 2015). The academic literature provides details of roughly a dozen such programs at universities across the country (Sleeter and Thao, 2007; Smithsonian, 2017), and it is possible there are similar programs at a number of other campuses.

Most of the country's students of color, however, attend one of the 3,000-plus colleges or universities at which such programs may not exist (U.S. Department of Education, 2019a). Efforts to close the teacher diversity gap, or at least narrow it, will benefit from gaining new insights into the experiences of students of color on these campuses, at both the graduate and undergraduate levels, as they take education courses and consider teaching careers. Such insights can inform transformational change on these college campuses that leads to sustained improvement in diverse students' retention and graduation rates in teacher certification programs.

1.1.4 Social Transformation Theory of Change

According to the social transformation theory of change proposed by Maton and colleagues (2008), successful diversity initiatives in higher education must take a broad approach that moves beyond simply increasing representation of students of color to also draw on insights regarding variations for different groups in retention and graduation rates and overall academic performance. A key insight is that transformational change is often required because “deeply embedded features of social environments” can limit the effectiveness and sustainability of narrower or more focused efforts (Maton et al., 2008, p. 116). This implies that institutional change is multi-dimensional, with a bureaucratic or structural dimension involving strategies and values, a collegial dimension concerned with communication and engagement of different groups, and a symbolic dimension concerned with an understanding of institutional context and core values, and the articulation of new values (Maton et al., 2008; Williams, Berger, and McClendon, 2005).

Williams and colleagues (2005) argue that the change process should involve an approach in which higher education leaders reject the notion that students of color must adapt to existing structures and instead consider how the institution can change to meet their needs. Attempts to enact change at colleges and universities are often thwarted by the nature of these institutions, which differ from other organizations in that they are characterized by “irrational systems, nebulous and multiple goal structures, complex and differentiated campus functions, conflicts between espoused and enacted values, and loosely coupled systems of organization and governance...” (Williams et al., p. 2).

Ultimately, producing more teachers of color will require colleges and universities across the country to commit to making programmatic and institutional changes that will meet the needs of students of color in these programs, and allow them to be successful. As the social transformation theory of change suggests, insights regarding student experiences and their relationship to persistence in the education program will serve to guide this change process. This study aims to inform program development at the institutional level while also, at a broader level, highlighting the factors associated with students persisting in a teacher preparation program or shifting course.

1.2 Methods

1.2.1 Research Design

To address the research questions listed above, this case study used a mixed methods, pragmatic approach (Johnson & Onwuegbuzie, 2004). At the outset, student-level institutional data were used to explore differences in student performance and persistence according to race, gender, academic preparation, and other characteristics. These data served as a guide for focus group discussions and semi-structured interviews with students who completed the teacher education program and others who did not; qualitative findings from the focus groups and interviews, in turn, informed further data analysis and development of additional research questions for future analysis (Cresswell & Clark, 2007, p. 72). The approach thus used elements of both the triangulation and explanatory designs described by Cresswell and Clark (2007).

1.2.2 Setting

UMBC is a mid-sized public research university with about 11,000 undergraduates and 2,500 graduate students. More than half of the university's undergraduates complete majors in science, technology, engineering, and mathematics (STEM), and the university is highly diverse, with White, Asian, Black and Hispanic students accounting, respectively, for 41%, 22%, 18% and 7% of undergraduate enrollment (UMBC Common Data Set, 2017-18). The university is nationally recognized for the success of its Meyerhoff Scholars Program, which is focused on preparing students from underrepresented groups—particularly African Americans—to become research scientists and engineers. UMBC now leads the country in producing African American graduates who go on to complete MD/PhDs (Hrabowski and Henderson, 2017), and the university has built its identity around the concept of inclusive excellence. According to the social transformation theory of change proposed by Maton et al. (2008), efforts to increase the achievement and retention of students of color in higher education benefit from the creation of empowering community settings, grounded in an understanding of students' unique assets and needs, at institutions with a stated commitment to inclusive excellence. Likely as a result of the Meyerhoff program and other university initiatives focused on student success, UMBC sees little difference in certain academic outcomes for specific groups. For instance, the university's average 6-year graduation rate for students who started as first-time full-time freshmen in the five academic years beginning in 2007 was 64.0% and 62.2% for White and Black students, respectively. In contrast, the national average 6-year graduation rate for students who started in

2008 was 63.2% and 40.9% for White and Black students, respectively (Musu-Gillette et al., 2017).

While UMBC may stand out for having similar outcomes across racial groups according to this one metric, variations among groups may exist in specific disciplines, including education. Though the university does not offer a stand-alone education major, it offers undergraduate coursework leading to certification in early childhood, elementary, secondary, English for Speakers of Other Languages (ESOL), and K-12 education programs in music, dance, art and foreign language.² The education department also offers a similar sequence of courses leading to a Master of Arts in Teaching (MAT) degree. It currently has 19 tenured, tenure-track, and clinical faculty members. Each year between 2005 and 2017, an average of 38 undergraduates and 44 MAT students completed the coursework required for certification, with the numbers declining slightly in recent years (UMBC data).

The education program, particularly at the undergraduate level, is markedly less diverse than the university as a whole, and as such comes closer to reflecting the diversity of the teaching workforce. The students completing UMBC's undergraduate teacher preparation program in the past 13 years, for instance, were 74.9% White, 6.7% Black, 3.3% Hispanic, and 9.8% Asian, while MAT recipients were 65.7% White, 16.8% Black, 3.3% Hispanic, and 5.2% Asian. Preliminary data indicated the students taking the first course in the undergraduate education sequence were 60.5% White, 12.6% Black, 5.4% Hispanic, and 13.6% Asian, suggesting dynamics that may

² One possible limitation of this study emerges from this lack of an education major. It is possible that the population of prospective teachers who attend UMBC and take teacher education courses is different in certain ways from the population of prospective teachers who attend a comparable university that offers an education major. The study addresses this concern as a possible limitation in terms of the generalizability of any findings.

make it less likely for students of color to persist in the program. That this apparent drop-off occurs at a university with a strong stated commitment to inclusive excellence makes it an interesting setting within which to explore the factors specific to teacher preparation program that may make it more or less likely for students of color to persist.

1.2.3 Participants and Data Collection

Demographic information on students enrolling in education courses leading to certification, along with details regarding academic performance and progress, persistence in the education program, and other factors, came from the university's department of Institutional Research, Analysis and Decision Support (IRADS). Since UMBC does not have an undergraduate education major, students seeking teaching certification must either (1) take the required education coursework and examinations while completing a major and other university graduation requirements, or (2) enroll in the university's Master of Arts in Teaching (MAT) program, which is open to students who have completed at least a bachelor's degree at UMBC or elsewhere.

Qualitative data came from two focus groups (with two and three participants, respectively) and seven semi-structured interviews exploring the academic experiences and career goals of alumni of color who either (1) graduated from UMBC in the past six academic years having completed undergraduate or MAT program coursework required for certification and entered the teaching profession or (2) enrolled in courses in either program during the same time period without completing the full sequence. Given the goal with these focus groups and interviews of gaining a rich understanding of students' experiences in the teacher education program, and

also the relatively limited number of students of color who completed the program during the period being studied, non-random sampling techniques were used to identify potential focus group participants (Onwuegbuzie & Leech, 2007). Participants were identified using institutional data and faculty and staff recommendations. Recruitment proceeded using a combination of convenience and snowball, or network, sampling techniques (Onwuegbuzie & Leech, 2007). Participants, once identified through recommendations or institutional records, were invited to suggest others who may have insight regarding the factors associated with persistence in the program or departure from it.

1.2.4 Data Analysis

Analysis of each research question proceeded as follows.

- i. *What factors are associated with students of color at a public research university completing or leaving a teacher education program?*

Student-level institutional data were used to explore the persistence and academic performance of students in the past 10 academic years who took one or more gateway courses in the undergraduate and master's level teacher education programs. The key outcome for undergraduates and MAT students was whether students successfully completed the program requirements and obtained certification to teach. The primary analysis proceeded using the following basic model.

$$y_i = \beta_0 + \beta_1 X_i + \beta_2 \text{Race}_i + \beta_3 \text{Male}_i + \beta_4 \text{Support}_i + \beta_5 \text{Academic}_i + \beta_6 X_i + \mu_i$$

In this model, outcome *y* is completion of the program, the capstone internship course, or of the appropriate degree. The model also includes a series of indicator variables for race / ethnicity, gender, and participation in various programs offering academic, social, and/or financial support. Variables controlling for academic preparation are included for subsamples of undergraduates who entered either as freshmen or transferred from a two- or four-year college or university. The model also includes a number variables controlling for whether a student previously went to a private school, attended UMBC part-time, or matriculated at the university in the spring term.

- ii.* How do teachers of color who earned their teaching certification at a public research university describe the experiences that they believe contributed to their persistence in the program?
- iii.* How do teachers of color who earned their teaching certification at a public research university describe the challenges, if any, that they encountered while enrolled in the program?
- iv.* How do students of color who started, but did not complete, the teacher education program at a public research university describe their experiences in the program and their decision not to continue?

Three semi-structured interviews and two focus groups involving two and three participants, respectively, were held with teachers of color who completed UMBC's undergraduate or MAT teacher education programs to explore factors associated with their completion of the program and identify challenges they may have encountered. Four additional semi-structured interviews were held with people of color who started, but did not complete, the undergraduate or MAT teacher education programs to gain additional insight regarding challenges that resulted in departure from the program. The focus groups and semi-structured interviews

followed the same interview protocol to ensure consistency, with minor changes in the case of those who did not persist in the program. (See the Appendix A for the proposed protocol.) Audio recordings from the focus groups and interviews were transcribed, and analysis proceeded using Dedoose software. Thematic codes were developed and applied to the data, and these were used to explore relationships as they related to persistence in the program and any challenges that participants encountered.

1.3 Policy Significance

Closing the teacher diversity gap will require a multi-pronged approach involving colleges and universities preparing more teachers of color, school systems making it a priority to hire and retain these teachers, and also broader societal changes involving attitudes toward the teaching profession (Putman et al., 2016). Attempting to address the first of these elements, a number of colleges and universities have developed programs focused on recruiting and preparing more students of color to become teachers, and several have reported success with these efforts (Lau, Dandy & Hoffman, 2007; Ukpokodu, 2015).

However, the impact of these programs is limited. By providing insight into the experiences of prospective teachers of color at a public research institution where no such program exists, this study informs discussion regarding the types of institutional changes likely to result in more students of color persisting in education coursework leading to teaching certification. Given the complex issues surrounding the teacher diversity gap, a deeper understanding of the obstacles confronting these

students, as well as the opportunities available to them, will be helpful in developing policies and strategies to address this challenge and promote transformational change.

Chapter 2: Literature Review

The diversity gap between students and teachers at public schools in the United States has deep historical roots, and it intersects with a range of issues involving opportunity and access for people from varying racial and ethnic backgrounds. As discussed in the introductory chapter, researchers have examined these issues from various perspectives and with differing objectives. The resulting literature is broad, and yet it can be grouped roughly into three sections according to differing viewpoints and questions. This review will focus on each of these areas, in turn, while considering overlapping issues as they emerge.

The first section of this review, *The diversity gap and the teaching workforce*, examines the origins of the gap and the factors that have sustained it. It begins with a discussion of the gap's historical roots, and it continues with a look at how the gap relates to existing and projected teacher shortages. Next is a review of the literature regarding the forces that create and sustain this gap. On the one hand are a number of factors limiting the supply of people of color who are interested in teaching and also have the credentials needed to enter the profession. In particular, the review focuses on the progressive underrepresentation of students of color — particularly Black and Hispanic/Latinx students — among those entering college and completing initial and more advanced degrees. While supply issues clearly contribute to the diversity gap, many scholars contend that factors related to the demand for teachers of color, including high turnover rates and school hiring practices, play an important and possibly dominant role. Finally, the section concludes with a discussion of the

literature exploring the motivations and decision-making processes of those who decide to become teachers, including consideration of the extent to which public-service motivation may enter into these decisions.

The next section, *The importance of teacher diversity*, examines two strands of literature relating to the motivations of researchers, policy makers, and others as they focus attention on this issue. The first of these strands involves general concerns about fairness and opportunity. The relative lack of diversity among public school teachers means that there is a reduced likelihood that students of all races will experience having teachers and administrators of color as role models and mentors. The absence of people of color in these positions may also confirm notions about the distribution of power in our society, and thus may be contrary to the interests of promoting a properly functioning democracy in which young people of all races have the opportunity to develop and pursue their own career and personal goals. The second major strand concerns the impact of teacher diversity on a range of outcomes for students of color, including improved academic performance, less frequent and severe disciplinary penalties, an increased likelihood of assignment to gifted programs, and reduced likelihood of misplacement in special education programs (Gershenson et al., 2017; Yarnell & Bohrnstedt, 2018; Egalite, Kisida & Winters, 2015; Grissom, Kern & Rodriguez, 2015). This discussion will explore the idea of “representative bureaucracy,” which suggests a public organization may better serve its clients to the extent the diversity of its employees reflects that of the population it serves. Finally, the discussion will explore mechanisms that have been proposed to

explain evidence showing improved school outcomes when there is racial congruence between students and teachers.

The final section, *Preparing students of color to be teachers*, focuses on research related to the role and success of colleges and universities as they endeavor to recruit students of color to teacher education programs, retain those who start, and prepare them to be successful teachers. The discussion will begin by focusing on the prevailing model for teacher education programs and concerns about how well it meets the needs and concerns of students from different racial and ethnic backgrounds. This will include a close look at key studies that have focused on the experiences and goals of students of color in teacher education programs. The next part will discuss several specialized programs that have been developed at colleges and universities across the country with the goal of recruiting, supporting, and preparing students of color who are interested in teaching careers. While these programs vary in the extent to which they have been subject to rigorous evaluation efforts, the discussion will focus on program effectiveness while also exploring differences and commonalities in terms of types of support offered, target populations, and program structure. The section will conclude with a discussion highlighting an approach to transformational change that has been proposed for higher education institutions seeking to address issues of underrepresentation. Maton and colleagues (2008), describing the social transformation theory of change, emphasize that successful and enduring diversity initiatives in higher education must take a broad, multi-dimensional approach that involves the articulation of strategies

and values, the engagement of different groups, and an understanding of institutional context.

2.1 The Diversity Gap and the Teaching Workforce

2.1.1 The Diversity Gap: Size and Origins

The teacher diversity gap at public schools in the United States is large and enduring. According to the National Center for Education Statistics, 80.1% of public school teachers in 2015-16 were White, but White students accounted for only 49% of those who were enrolled (Musu-Gillette et al., 2017). While the teaching workforce has gradually become more diverse — the percentage of White teachers decreased 6.8% over the 25-year period beginning in 1987-88 — this change is not keeping pace with shifting enrollment patterns. Students of color accounted for only 30% of those enrolled in public schools in 1986-87, but now students of color, taken as a group, are the majority in public schools (Musu-Gillette et al., 2017).

According to the National Center for Education Statistics (2017a), the United States had about 3.8 million public school teachers in 2015-16; non-White teachers, accounting for almost 20% of that total, were primarily Hispanic/Latinx (338,000 teachers; 8.8% of total), Black (256,000 teachers; 6.7% of total), and Asian (86,000 teachers; 2.3% of total). As highlighted in the Introduction, Maryland is among the states with the largest teacher diversity gaps, with a teaching workforce that is 83% White and a student-age population that is 43% White (Boser, 2014).

The nation's teacher diversity gap developed in the aftermath of the Supreme Court's 1954 *Brown v. Board of Education* ruling that racial segregation in public

schools was unconstitutional. While the decision was widely hailed as a civil rights victory, it also resulted in widespread job losses for Black teachers as leaders of newly integrated districts reacted to the news. Before *Brown*, teaching was among the primary professional career options for African Americans, and particularly for women. In fact, Collier (2002) estimates that half of all African American professionals in 1950 were classroom teachers. According to Holmes (1990), 38,000 African Americans lost jobs as teachers and administrators in 17 states from 1954 to 1965. Tillman (2004) suggests the decision's impact on Black teachers is reflected in various trends over the following decades, including a 66% drop in Black students selecting teacher education as a major from 1975-1985; the departure of 21,515 Black teachers from the profession from 1984-1989 following the imposition of new teacher certification requirements and admission requirements for teacher education programs; and the regular dismissal of Black teachers who became involved in civil rights activities.

Before *Brown*, a teaching career also presented African Americans, and particularly women, with the opportunity to take on a leadership role in the community, Tillman notes. She argues that the change cut into the Black middle class while also placing Black children in a "racist context" in which they were less likely to be taught by teachers who cared about their "social, emotional, and academic success" (Tillman, 2004 p. 299). Walker (2000), in a review of 17 articles and books examining segregated schools in the South from 1935-1969, finds that these schools, while lacking in resources, compensated to varying degrees by developing their own curricular and extracurricular activities, embracing parental support, and employing

increasingly well trained teachers and administrators who “created their own culture of teaching” (p. 276). Walker argues that these characteristics developed out of the Black community’s response to pervasive racism: “In this world, all worked together to achieve the common goal of educating students to function and achieve in a world where the odds were stacked against them” (p. 276).

2.1.2 A Shortage of Teachers

While the changes following the *Brown* decision reduced opportunities for many African Americans to become or remain teachers, the Civil Rights Act of 1964 presented a new challenge for school districts and teacher education programs as it opened up new opportunities for women and people of color to pursue careers in such fields as engineering, business, or medicine (Villegas & Davis, 2007; Carter & Wilson, 1993). Before this legislation was passed, Villegas and Davis (2007) note, teacher education programs at Predominantly White Institutions (PWIs) and Historically Black Colleges and Universities (HBCUs) were able to take a relatively passive approach to recruiting given this lack of professional alternatives for women and people of color with college degrees. The Civil Rights Act thus ushered in an era of active teacher recruitment efforts focused on identifying potential teachers among such groups as undergraduates with undeclared majors, students at community colleges or pre-college, and career changers (Villegas & Davis, 2007).

Reports of teacher shortages in the news media have been common in recent decades. The U.S. Department of Education (2019b) maintains a database going back to the 1990-91 school year tracking teacher shortages as they have arisen in specific states and school districts and in particular subjects at certain grade levels. Inspection

of the report across academic years and grade levels reveals that shortages occur in far-flung districts across the country in such areas as special education, mathematics and science, foreign languages, and English as a second language. Ingersoll (2002), recounting predictions of imminent teacher shortages beginning in the early 1980s, outlines what turns out to be a recurring debate over whether these shortages arise primarily from an undersupply of qualified teachers to fill available positions or an excess of demand resulting from the high turnover of teachers in certain schools, resulting in a persistent struggle to recruit and hire qualified teachers. His 2002 study draws on data from the Department of Education's Schools and Staffing Survey (SASS) and the related Teacher Follow-up Survey (TFS) to look at teacher turnover as it relates to characteristics of particular schools and districts. He finds evidence that high turnover rates among teachers — averaging 12.4% for all public school teachers and exceeding 16% for teachers in high-poverty schools — contribute substantially to the need for many school districts to continually hire new teachers. About half of teachers reported leaving their positions because they found or were looking for a better job, a different career, or improved career opportunities, or they were dissatisfied with their jobs because of low salaries, a lack of administrative support, problems with student discipline, and other school-related factors. Ingersoll argues that this analysis points to the need for schools to approach the teacher shortage issue by increasing teacher retention, thereby reducing their demand for teachers.

In their analysis of the current teacher shortage, Sutchter, Darling-Hammond and Carver-Thomas (2016) emphasize the role of high teacher attrition along with three other factors: declining enrollments in teacher education programs, efforts by

school districts to return to staffing levels they enjoyed before the Great Recession, and increases in student enrollment. While three of these factors relate to demand for teachers rather than supply, Sutchter and colleagues note that producing new teachers is critical in the long-term, and also pressing in the short-term as schools struggle with retention. The trend is stark: student enrollments in teacher education programs decreased from 691,000 to 451,000, a drop of 35%, from 2009-2014 (p. 3). The authors suggest the drop may partly be the lingering result of much publicized teacher layoffs during the Great Recession, along with the stagnant salaries and limited resources associated with the budget limitations of that period (p. 26).

Echoing Ingersoll (2002), Sutchter and colleagues (2016) highlight the role of teacher attrition, particularly preretirement, in driving the demand for teachers to a level that plays out in many cases as a shortage of teachers. According to U.S. Department of Education data, preretirement attrition as a result of teachers being dissatisfied with teaching, changing careers, or other life changes was responsible for roughly two-thirds of overall teacher demand in 2011-12 and 2015-16 (p. 20). More than half of teachers leaving the profession reported dissatisfaction as a very important or extremely important reason for their decisions, with dissatisfaction with assessment and accountability measures (25%), dissatisfaction with administrators (21%), and dissatisfaction with teaching in general (21%) topping a list of the specific reasons (p. 50).

With demand for teachers increasing in recent years, largely because of continued high attrition and anticipated increases in enrollments along with efforts to reduce class sizes, and projections that these trends will continue in the next several

years, Sutchter and colleagues estimate a shortage of about 47,000 to 80,000 teachers in the 2015-16 school year. They further project there will be even more unmet demand for teachers in coming years as the supply of new teachers continues falling well short of what is needed (p. 29). Interestingly, the authors note, reducing the teacher attrition rate from 8%, where it is currently projected to remain, to 6%, just above where it stood in the United States in 1989, or even 4%, where it stands in some countries, could reduce or, in the latter case, largely eliminate the teacher shortage (p.40).

The hiring challenge that schools face results both from teachers leaving the profession and from those who switch between schools and districts. Nationally, about 16% of teachers each year do not return to the school they taught at previously, Sutchter and colleagues report. Turnover is highest among teachers who work at schools in the top quartile for the proportion of students of color, and it is particularly high among those with limited teaching experience (three or fewer years) or those teaching English Language Learners, working in special education, or teaching a STEM subject (p.46). Sutchter and colleagues observe that more than 75% of teachers of color work at these schools with the highest proportion of students of color.

Rice, Roellke, Sparks, and Kolbe (2009) look at issues relating to teacher shortages from a different angle, proposing a three-dimensional typology to categorize teacher policies at state, district, and school levels as they apply to challenges of teacher supply, recruitment, distribution, and retention. The policies considered include economic incentives, pathways into the profession, hiring strategies, professional development, and working conditions. They applied their

typology to explore relationships between these policies and staffing patterns at two districts in each of three states: Maryland, New York, and Connecticut. In addition to drawing on documents reflecting these policies, the researchers gathered quantitative data on school staffing patterns and qualitative data from interviews with administrators at each of the three levels, and also focus groups with teachers. Among their conclusions is the observation that teacher staffing issues are highly local, reflecting the interplay of policies at the different levels as well as regional economic and labor market conditions. A region brimming with better-compensated job opportunities for math majors, for instance, may struggle to find an adequate supply of teachers in that area (p. 522).

As required by state law, the Maryland State Department of Education (MSDE) issues a report every other year highlighting content areas and parts of the state facing teacher shortages and reviewing issues related to the recruitment, production, and retention of teachers in the state. The most recent report covers the period from 2016-2018 and declares critical shortages across nearly a dozen academic areas encompassing the arts, humanities, mathematics, the sciences, and special education (MSDE, 2016). In addition, the report identifies all 24 of the state's counties as areas of projected shortages of certified teachers. Significantly, it also projects shortages of men and people of color in the state's teacher workforce, and it calls attention to the fact that the supply of new teachers emerging from Maryland's colleges, universities, and alternative certification programs falls well below what the state's school systems are demanding. According to the MSDE report, 59% of recently hired teachers were either beginning their careers having been prepared

outside Maryland (41%) or were experienced teachers who last taught outside Maryland and likely were originally certified in another state as well (17%); only 22% of the recent hires were beginning teachers prepared in Maryland (p. 20).³

2.1.3 Reasons for the Gap (1): Underrepresentation at All Levels

While researchers and others commonly refer to non-White teachers collectively as “teachers of color,” the underrepresented groups included in that category have diverging academic profiles that relate to a range of socioeconomic factors. As discussed above, these teachers are primarily Hispanic/Latinx (9%), Black (7%), or Asian (2%), with teachers reported as Pacific Islander or American Indian or Alaska Native accounting for less than 1% of the teaching workforce (U.S. Department of Education, 2017a). The three largest of these groups have seen different demographic trends. The share of the population that is reported as Black or African American, for instance, has increased only slightly in recent decades and is now at about 13%, with a projected increase to 15% of the population in 2060 (Vespa, Armstrong, & Medina, 2018). Residents reported by the Census Bureau as being of Hispanic origin accounted for only a small percentage of the population in the 1960s, and yet they increased to nearly 18% of the population in 2016 and are projected to climb close to 28% in 2060. The Asian population started increasing in the middle of the 20th century, rising to almost 6% of the population in 2016, with a projected increase to more than 9% in 2060. Non-Hispanic Whites accounted for

³ While the report does not specify a time period in which these teachers were hired, other elements of the report suggest these data reflect hires during the 2014-15 academic year.

about 61% of the population in 2016 and are projected to decrease to 44% of the population in 2060 (Vespa et al., 2018).

The racial demographics of the under-18 population look more like this projected future, with the U.S. Census Bureau estimating that group in 2016 to be 51% White, 25% Hispanic, 15% Black, 5% Asian, and 5% other (Vespa et al., 2018). This picture of diversity changes when looking at levels of educational attainment. According to NCES data, the overall graduation rate for public high school students in 2015-16 was 84% (U.S. Department of Education, 2019c). Exceeding that average were students who were White (88%) or Asian (91%); students who were Black (76%), Hispanic (79%) or American Indian/Alaska Native (72%) were all less likely to finish high school.

There is also considerable variation among students from different racial and ethnic groups in the likelihood of their going straight to college after completing high school. According to the Bureau of Labor Statistics, 92% of Asians who finished high school in 2016 went straight to college, compared to 72% of Hispanic or Latinx students, 70% of Whites, and 58% of Black students (U.S. Department of Labor, 2017). Looking instead at students pursuing 4-year degrees, variations for students of different racial and ethnic groups are again apparent, with the 6-year degree completion rate ranging from 68% for Asians to 60% for Whites, 49% for Hispanic / Latinx students, and 35% for Black / African American students (U.S. Department of Education, 2016b).

Ultimately, different educational experiences at all levels, along with a variety of social and economic factors, contribute to variations in the level of education

obtained by people from different racial and ethnic groups. According to the U.S. Census Bureau (Ryan & Bauman, 2016), of those 25 and older in 2015, 54% of Asians, 38% of non-Hispanic Whites, 15.5 % of those from Hispanic backgrounds, and 22.5% of Blacks held at least a bachelor's degree. The experiences underlying these differences in degree attainment reflect a narrowing in the teacher production pipeline that occurs even without considering the preferences of individual students. Given that completion of a 4-year-degree is a basic requirement for obtaining certification to teach, the potential supply of teachers of color — or really just Black and Hispanic / Latinx teachers — is already limited. Obtaining a teaching workforce that reflects the country's racial diversity would require a disproportionately large percentage of Black and Hispanic / Latinx bachelor's degree recipients to go into teaching.

That isn't happening. While future teachers can major in a variety of subjects and still complete teacher certification requirements, many opt to complete education majors. As such, the diversity of students completing education majors at 4-year colleges and universities is suggestive of diversity of those completing certification. Data retrieved from the National Science Foundation's WebCASPAR system show that White students are overrepresented among those completing education degrees, having received 56% of all 4-year degrees awarded in 2015 but 66.4% of education degrees. Black, Hispanic / Latinx, and Asian students, by contrast, all accounted for a lower percentage of education degrees granted than they did the total share of degrees

(National Science Foundation, 2019).⁴ Looked at another way, the percentage of degree recipients from each group majoring in education that year were as follows: White, 7.7%; Black, 6.0% ; Hispanic / Latinx, 4.8%; and Asian, 2.8%.

While patterns of degree completion may reflect the differing preferences and career goals of individual students, pre-professional exams required for would-be teachers in most states may also play a role. For instance, Maryland and more than two dozen other states require students to pass the *Praxis I* standardized exam to demonstrate basic proficiency in mathematics, reading and writing before being admitted to teacher education programs. Nettles, Scatton, Steinberg, and Tyler (2011) found wide disparities in first-time pass rates for students taking the exam between 2005 and 2009. For White test takers, the pass rates in reading, writing, and mathematics were 81.5%, 79.5% and 78.2%, respectively; pass rates for Black or African American test takers, by contrast, were 40.7%, 44.2%, and 36.8% in the three areas.⁵

Researchers have proposed several explanations for variation in pass rates on *Praxis I* and other standardized exams administered for entry into teacher education programs and as requirements for certification. Gitomer, Brown, and Bonnett (2011) looked at results on the *Praxis II* exam, a test of content knowledge administered at the time of licensure, and found evidence that performance on *Praxis I* was a strong predictor of success on that test, and may as such have value in identifying academic strengths and weaknesses as students prepare for teaching careers. Albers (2002)

⁴ Asians receive 5.5% of all degrees and 2.4% of education degrees; Blacks accounted for 11.3% of all degrees and 10.5% of education degrees; Hispanic / Latinx degree recipients were 13.3% of all degree recipients and 9.8% of education majors.

⁵ The researchers reported that the relatively low number of test takers who were Asian, Hispanic or from other groups limited their analysis to White and Black students.

takes a different view in a study based on interviews with four African American prospective English teachers who failed the *Praxis II* exam. The prospective teachers reported feeling discouraged and disoriented by the results despite having what they felt were strong backgrounds in English; Albers contends *Praxis II* and related tests fail to account for the “cultural realities” of different test takers and thereby “contribute to the oppression of non-White teacher candidates whose knowledge and experiences” may differ from those deemed most important by authors of the test (p. 122). Petchauer (2016), in a 3-year qualitative study involving 31 Black students in a teacher education program at an HBCU, finds evidence that these students assess their ability to pass the exam through a lens tinted by their previous exam and classroom experiences and the perception that other students like them commonly failed the exam. He concludes that university-based teacher education programs need to take early steps with students beginning the program to counter these perceptions and provide test-taking support.

2.1.4 Reasons for the Gap (2): Supply & Demand

The experiences leading to lower levels of educational attainment among certain groups clearly limit the potential supply of teachers of color. A later section of this chapter will look at factors involved in the decision to become a teacher and explore studies offering reasons why young people of color, particularly Black youths, may be less likely to decide on a teaching career. The persistence of students of color in teacher education programs is yet another topic that relates to the supply of teachers of color, and it is the main focus of this study.

In addition to these supply issues, education researchers have proposed that factors related to the demand for teachers play an important, if not dominant, role in explaining both the teacher shortage and the lack of teachers of color. Foremost among these demand concerns is the issue of turnover: schools are constantly in hiring mode because of the large number of teachers switching jobs or leaving the profession each year. While these demand issues are often treated as distinct from those of supply, there are areas of overlap, particularly when thinking about lessons that low teacher retention rates may suggest when thinking about teacher preparation programs.

In their 2010 review article, Achinstein, Ogawa, Sexton, and Freitas examined 70 studies on the retention of teachers of color and found evidence that turnover rates are indeed higher for teachers of color than they are for White teachers. They report a wide range of findings: among teachers of color, men are more than twice as likely as women to quit teaching; teachers of color certified in their main teaching field were more than twice as likely to continue teaching as those certified in another area; and teachers of color are more likely to teach in urban and under-resourced schools that tend to see higher rates of teacher turnover. Interestingly, multiple studies have found that teachers of color were less likely than White teachers to leave schools of this type, a finding that suggests "...a potential solution to hard-to-staff schools but also raises equity concerns about people of color relegated to schools with lower levels of multiple forms of capital" (Achinstein et al., 2010, p. 87). This points to possible differences in factors relating to the retention of teachers of different races. In particular, Achinstein and colleagues point to findings that the likelihood that teachers

of color will remain in the profession may be related to their “humanistic commitments” to work with students from low-income or underserved backgrounds (p. 90).

While the traditional route to teaching certification involves completion of a university-based teacher education program, there are alternative paths that may involve completion of intensive training programs offered by school districts or outside organizations, or conditional certification while a beginning teacher completes necessary coursework. There is evidence that teachers certified in this manner are less satisfied with their training and ultimately leave the profession at higher rates (Achinstein et al., 2010; Darling-Hammond, 2000). While it is not clear whether there are racial differences in retention rates for teachers who went through alternative certification programs, Shen (1998) found in a nationally representative sample of teachers that people of color accounted for 21% of those certified through alternative programs but only 13% of those who completed traditional certification programs. This suggests that the certification route may play some role in explaining differences in retention rates for teachers of different races.

Using data from the six cycles of SASS and TFS administered from 1987-88 to 2007-08, Ingersoll and May (2011) also make the case that teacher staffing shortages and the teacher diversity gap are primarily the result of low teacher retention rates. Departure rates for White and non-White teachers were roughly equal in just one cycle; the percentage of teachers of color switching schools or leaving the profession was higher in each of the other five cycles, reaching 19.4% and 19.3% in 2004-05 and 2008-09, respectively (compared to 16.4% and 15.6% in those two

cycles for White teachers).⁶ Ingersoll and May contend that efforts to recruit more teachers of color have in fact been quite successful, resulting in a 96% increase in teachers of color from 1987-88 to 2007-08.⁷ This increase seems less impressive when considering that teachers of color only went from 12.4% to 16.5% of the teaching workforce during that period, and that during that time students of color increased from 28% to 40.6% of total enrollment. Nevertheless, the researchers found that teachers of color were two to three times more likely to work in hard-to-staff schools, and that the increased likelihood of their departing these schools was the result of the “less positive organizational conditions” (p. 43). In particular, teachers of color cited a lack of autonomy, both at the faculty and instructional levels, as reasons for departing.

While many researchers have pointed to evidence that lower retention rates for teachers of color contribute to the size and persistence of the teacher diversity gap, D’Amico, Pawlewicz, Earley, and Mcgeehan (2017) suggest that hiring discrimination may also be a factor. The researchers used logistic regression to analyze teacher hiring in the 2012-13 school year in an unidentified district with more than 180,000 students. Applicants in the district apply through a centralized system and, though they specify the type of position they are seeking (e.g. a particular subject or grade level), they are not able to indicate preferences for particular schools.

Whites were 70.1% of the applicants that year, and they were hired for 77.2% of the

⁶ Though their analysis focuses on teachers of color collectively, the researchers note that, in the 2003-04 administration of the SASS, the group included teachers who reported they were Black or African American (7.4%), Asian (1.4%), American Indian/Alaska Native (0.6%), native Hawaiian/Pacific Islander (0.2%), Hispanic (6%) and of multiple races (0.7%).

⁷ That time period saw broad expansion of the teaching workforce, with a 41% increase in the number of White teachers (Ingersoll & May, 2010).

positions; Blacks were 12% of applicants and were hired to fill 6.3% of the openings. Consistent with other studies, Black candidates were more likely to be hired at schools with high poverty rates or larger proportions of Black students, filling 10% and 11% of positions, respectively, at these school types. However, the presence of a Black principal was the factor most associated with Black candidates succeeding, with Blacks accounting for 12% of the 194 hires made by these principals, matching in this case their representation in the applicant pool.

While these results are suggestive, D'Amico and colleagues acknowledge various limitations, including the possibility that the results may reflect hiring practices in a particular district and may not be generalizable. The data also do not rule out the possibility that Black candidates may have been more likely to turn down job offers from White principals, though the researchers report anecdotal information from human resources staff members that this rarely happened. Nevertheless, the results suggest that the race of school administrators plays a role in perpetuating the teacher diversity gap. Further, it highlights the centrality of the pipeline challenge: that is, the lower retention rate for teachers of color limits the size of the pool of people of color who might become principals. Nationally, according to NCES data, 77.8% of public school principals in 2015-16 were White, so a small difference in hiring preferences among administrators of different races could have a sizable impact in reproducing the diversity gap between teachers and students.

2.1.5 Public Service Motivation and the Teaching Profession

Achinstein and colleagues (2010) report that one theme emerging from their review of the research literature is that people of color who become teachers or stay in the profession are often motivated by “humanistic commitments” in the form of a desire to give back to the community, serve as change agents, or make a difference in the lives of young people (p. 85). In the language of public management researchers, these teachers report that rather than being motivated by extrinsic rewards — e.g. promotions or pay raises — they are more apt to be oriented toward intrinsic rewards, and particularly the feeling of accomplishment associated with doing something they feel is meaningful. Crewson (1997), drawing on data from the General Social Survey and a survey administered by the Institute for Electrical and Electronics Engineers, looked at differences in responses provided by public and private sector employees and found evidence supporting the theory of “public service motivation,” or PSM. At the heart of theory is the idea that people drawn to public and private sector work may be motivated by different rewards, and as such may function most effectively under differing incentive systems. While economic rewards are clearly important for public-sector employees, Crewson observes, public organizations must achieve the “delicate balance... between providing adequate economic rewards and taking care not to destroy or ignore the intrinsic or service needs of employees” (p. 515).

Crewson’s 1997 study focuses broadly on differences between public and private sector employees, and makes no specific reference to the teaching profession. And while many scholars have looked at applications of the theory and its implications for leadership and worker satisfaction, the teaching profession is

generally mentioned only in passing, if at all. Jin, McDonald, and Park focus on public higher education in their 2018 study, and they report mixed results in their analysis of the relationship between the PSM of faculty and their productivity in terms of teaching, research, and service. One investigation focused on teaching at the K-12 level is Anderson, Heinesen, and Holm Pedersen's 2014 study examining the relationship between the PSM of Danish teachers and the academic performance of students in the courses they taught. When controlling for gender, experience, and variety of other factors, the researchers found that high PSM, as indicated on a questionnaire administered to the teachers, is strongly associated with improved academic performance of students. As the researchers note, the study cannot rule out the possibility of selection bias, with more motivated students or their parents possibly seeking out teachers who rate as having high public service motivation, perhaps because they signal in some way not reflected in the data that they are particularly interested in the success of their students.

For the purposes of this discussion, the relationship between PSM and student performance may be less important than the insight that teachers may often be motivated more by intrinsic rewards than by such extrinsic factors as pay raises. While researchers investigating the recruitment and retention of teachers of color do not make explicit mention of PSM, they frequently highlight the importance of recognizing motivations of this sort. Lewis (2006), for instance, surveyed 147 Black male teachers in three Louisiana school districts to explore factors associated with the recruitment and retention of teachers from this group, and identify strategies to increase their numbers. Asked about the most effective "recruitment mechanisms"

that convinced them to select the profession, the teachers most commonly cited “helping young people”; another message relating to intrinsic motivations — “contributions to humanity” — was third in the list of responses most often provided. The teachers also were asked about important retention mechanisms, and “contributions to humanity” was second on the list of most commonly cited reasons, appearing just behind “job security.”

Brown and Butty (1999) also relied on survey data, and in this case focused on African American male teachers in Maryland’s Prince George’s County who were hired between 1993 and 1998. They asked the teachers a range of background questions, including whether they completed an education major, completed teaching certification, and considered themselves motivated to impart knowledge in children. They then ran a series of regressions involving three outcomes: the teachers’ motivation to pursue a graduate degree in the next 5-7 years in education or another field; their intention whether or not to be working as teacher or administrator at a public school in 10 years; and their belief whether or not they would be working as a teacher or administrator at a public school in 10 years. The study has various shortcomings, including the selection of outcome variables that, in the first case, may be unduly constrained, and in the second and third seem to overlap considerably. Additionally, the value of any relationships uncovered through the regression analysis may be limited given that the outcomes and predictor variables are self-reported and may in some cases reflect common causes. Nevertheless, the researchers found that teachers who reported an “interest in imparting knowledge” were more likely to be

committed to the teaching profession, as reflected in having the goal of completing a graduate degree in education.

While more research in this area is needed, these studies have clear implications for diversifying the teaching workforce. As Achinstein and colleagues (2010) note, potential teachers of color may be receptive to “policies and programs that call on their commitment to serve and that provide support and opportunities to advance the educational interests of students of color” (p. 86). To the extent that “humanistic commitments” and the service-orientation of teachers of color may reflect high PSM, the public management literature may offer additional lessons. As Moynihan and Pandey conclude in their 2007 investigation into the role of organizations in cultivating PSM, effective strategies may include efforts to cut red tape, clarify goals, and empower employees.

2.1.6 Students of Color and the Decision to Become a Teacher

While some future teachers recognize their interest in the profession while they are in college or even after starting other careers, others develop an interest at an earlier age. According to Mau and Mau (2006), 2.2% of 10th grade students who participated in the 1988 National Educational Longitudinal Survey (NELS) and two follow-up surveys (1990 and 1994) reported an interest in teaching. These 451 students were primarily White (85.8%) and female (79.4%), and the 183 students who reported in the follow-up survey four years later that they were still interested in teaching as a career were an even more homogenous group (89.1% White and 83% female). Only 6% of the students who initially reported an interest in teaching were Black, and these students were more likely than White students to switch to other

careers in the follow-up survey, with just 7 of the 28 Black students retaining an interest in teaching; all of the 6 Asian students who had expressed initial interest in teaching switched to other career interests in the follow-up. In contrast, 42% of Whites retained their teaching interest; 43% of Hispanic students also retained their interest in teaching, though it should be noted that this group only made up 5.1% of those who expressed initial interest.

Miller and Endo (2005) conducted a qualitative study focused on exploring reasons students of color in undergraduate teacher education programs at two unspecified universities wanted to become teachers. They used a survey with open-ended questions. Reasons provided include (1) having educators in the family, (2) support from parents, (3) having teachers as role models, and (4) having established a connection with a teacher, particularly one with same cultural, racial, or ethnic background. Interestingly, five of the eight respondents entered college before deciding they wanted to become teachers. The researchers contrast this with the report from Claycomb and Hawley (2000) that only 38% of students in teacher education programs made the decision while in college. While Miller and Endo suggest this may point to a difference for students of color in the timing of their career decision making, the small sample and other limitations of the study point to a need for additional investigation on this topic.

After conducting semi-structured interviews with 140 teachers of color in three states, Gordon (1994) identified three dominant themes in the proposed explanations of why more people of color were not entering the teaching profession. First among these are their experiences as students, with many having had poor

academic preparation and also experiencing classes with frequent disruptions and in which teachers were disrespected. Additionally, the teachers discussed a general sense that teaching was not well-regarded in their communities, with many seeing low interest in teaching as the result of a lack of encouragement, the limited availability of role models, and concerns about the low status of teachers or the perception that showing an interest in school is seen as “acting White,” in the words of the researcher (p. 349). Finally, many cited social and economic explanations, including low pay, poor school conditions, and perceptions that men who are interested in teaching are “wimpy” or effeminate.

Noting that Black men only account for 1-2% of all teachers, many researchers have explored the attitudes of young Black males regarding the profession. Bianco, Leech, and Mitchell (2011) examined the experiences five Black male participants in a pilot program aimed at recruiting high school juniors and teachers to become teachers in urban settings. Their mixed methods study used data from a survey and interviews to investigate the participants’ views of the teaching profession and the ways those views were shaped by their own experiences. Four of the students reported they had generally positive experiences in school, though all said they had encountered racism, offering anecdotes that commonly involved White female teachers, who they felt treated them harshly in some cases or with apparent condescension in others. Four of the students were interested at the time in teaching careers, though three reported perceptions that the profession was “somewhat” or “very” disrespected. All of the students said they had one to three Black teachers in high school, and three said those teachers played a positive role in their thinking

about becoming a teacher. It is unclear how many encountered Black male teachers, and their impressions of Black men as teachers varied, with three suggesting they are positive role models apt to “give it to you straight,” and another suggesting instead that their efforts relate to students’ experiences could be “irritating” (Bianco et al., 2011, p. 377). One student, despite a positive view of their potential to relate to students of color, said the rarity of such teachers was a negative factor in his thinking about becoming a teacher: “I don’t want to be a teacher if there’s only going to be White teachers and I’ll be the stand out guy” (p. 376).

While Bianco and colleagues focused attention on students who had expressed interest in teaching by virtue of their participation in a recruitment program, Graham and Erwin took a different approach in their 2011 study as they randomly selected young Black men who were juniors at six high schools and met minimum academic requirements to be invited to participate. Ultimately, they conducted focus groups with 63 participants and identified several themes that emerged in the discussion. The researchers concluded the participants generally had unfavorable perceptions of teachers, classifying 59% of words used to characterize classroom teachers as negative. Many participants regarded schools as oppressive and thought teachers tended to devalue African American males and their experiences, and they reported feeling isolated in upper-level classes. One talked about English class and how they “talk about race in that class every week and when that topic comes up they look to us to represent everybody and ask us why we do this or why we do that and we’re just like up on a pedestal and we have to bring everybody else with us” (Graham & Erwin, 2011, p. 408).

Though financial considerations about the teaching profession were not among the major topics or themes to emerge in the focus groups, the researchers touched on that issue briefly in a short survey administered at the start of the sessions. Three of the participants initially reported a willingness to consider a teaching career. That increased to 16, or roughly a quarter of the participants, who responded they would do so if a full four-year scholarship were available to pay “all collegiate expenses” (p. 406).

2.2 The Importance of Teacher diversity

2.2.1 Fairness and Democratic Values

As detailed later in this section, education researchers in recent years have found increasingly strong empirical evidence that students, and particularly students of color, benefit from exposure to a diverse teaching workforce (e.g. Gershenson et al., 2017; Yarnell and Bohrnstedt, 2018). These results add a sense of urgency to discussions regarding the most effective means of producing and retaining more teachers of color. Yet others take a more philosophical approach in arguing that basic concerns about fairness and producing a well-functioning democracy also serve to motivate these efforts. Waters (1989), for instance, argues that the function of public schools extends beyond the teaching and learning that takes place within them: they also play a role in shaping the values of students and expressing the values of society, and they ultimately reflect the larger culture. A lack of teacher diversity, Waters writes, is harmful to students of all races because it deprives them of experiences that could undermine harmful racial stereotypes. Increasing the number of Black teachers inside classrooms, for example, would give more non-Black students opportunities to

interact with them as “capable, contributing citizens” (Waters, 1989, p. 268). Loehr (1988), makes a related point, arguing that the relative lack of teachers of color sends a message to all students that school is for White people, both as a career goal and as a domain within which to be successful.

Along similar lines, Matcznski and Joseph (1989) cite the country’s multicultural and multiracial identity as motivation for a summer recruitment program developed at the University of Dayton to encourage Black high school students to consider careers in teaching. “...An education which attempts to cover cultural pluralism cannot be achieved unless all cultural perspectives are presented in the classroom...,” they write, emphasizing the potential for Black teachers to serve as role models for students of all races (Matcznski & Joseph, 1989, p. 43). For Black students, particularly those from under-resourced settings, this may involve serving as a model of professional success and also potentially as a person with whom they might relate. By serving as role models for non-Black students, Black teachers also have the opportunity to promote “racial understanding” (Matcznski & Joseph, 1989, p. 43).

Carrying these arguments a step further, Hawley (1989) contends that increasing the supply of teachers of color, and particularly of Black teachers, will strengthen the fabric of the country by getting at the root causes of racism. Racism and ethnic isolation have a tendency to reinforce each other as they together contribute to the suffering of individuals and the failure of society to achieve at the highest level possible. This isolation is harmful for people of all races, Hawley writes, including White people who may have “little or no personal contact with non-Whites”

and as a result “do not develop the capacity for interpersonal communication with non-Whites and other persons different from themselves” (Hawley, 1989, p. 32).

While society benefitted from increased racial integration of public school students as a result of initiatives in the 1960s and 1970s, Hawley argues, progress slowed or reversed in the 1980s. As a result, the best opportunity to realize additional benefits of integration involves exposing students to a racially integrated teacher workforce in which White and non-White teachers work together and interact as equals. “The only opportunity many young people will have to experience the lessons that can be best taught in racially integrated learning environments is to be taught by a teacher corps that is racially integrated” (Hawley, 1989, p. 34).

2.2.2 Representative Bureaucracy

The potential benefits of a diverse teacher workforce can also be understood through the lens of concepts in public policy. *Bureaucratic representation* is the notion that certain groups may benefit when the employees tasked with implementing public policy and providing services share similar backgrounds and values (Grissom, Kern & Rodriguez, 2015; Pitts, 2007). This idea goes back to Donald Kingsley, who argued in his 1944 book that the British civil service was particularly effective during World War II because common values unified public employees and the citizens they served. A central insight is that public employees, though unelected, exercise considerable discretion as they interpret and implement public policy; as such, their role in the way the public experiences those policies can be “overwhelming” (Grissom et al., 2015, p. 185). Though Hawley (1989) does not draw directly on the idea of representative bureaucracy, his argument on the importance of teacher

diversity takes a similar line as he notes that awareness of “racism... affect[s] the perception of the quality of services received by the victims of discrimination and inequality” (p. 32).

While the perceptions of those receiving public services may influence their utilization of those services, public employees also may act in ways that have differing benefits for different groups. To the extent that bureaucrats have discretion as they implement policy, they may act in ways that reflect their values and norms (Pitts, 2007). These values and norms, in turn, are related to the experiences of individual bureaucrats and their demographic backgrounds, particularly gender and race/ethnicity.

The research literature on bureaucratic representation includes a range of empirical studies linking the racial or gender composition of a particular workforce to the benefits received by clients across agencies involved in investigating employment and housing discrimination, enforcement of child support, and policing (Grissom et al., 2015). Grissom and colleagues note that education researchers have rarely made explicit reference to the theory despite the fact that public schools collectively are the largest public sector employer in the United States and extensive work looking at the relationship between the race and gender of teachers and various student outcomes has been conducted. Yet the theory is easily applied to public education, with teachers serving as “street-level bureaucrats” who are given considerable autonomy as they interact with a client population consisting generally of students and parents (Grissom et al., 2015).

Researchers have proposed various mechanisms through which clients may benefit from having the opportunity to interact with bureaucrats of the same gender or race / ethnicity. The first of these is partiality: teachers, for instance, might devote more time or attention to students of the same racial or ethnic background, possibly to counter what they regard as discrimination or partiality on the part of colleagues of other races and ethnicities. Grissom and colleagues (2015) note this raises general concerns about fairness if benefits from exposure to same-race teachers comes as a result of their receiving a disproportionate amount of attention.

A related possibility is that teachers may simply be more sympathetic toward students of the same gender and race/ethnicity. Ehrenberg, Goldhaber, and Brewer (1995), for instance, did not find evidence in their study using data from the National Educational Longitudinal Study of 1988 (NELS) that students who matched their teacher's race/ethnicity and gender ended up with higher scores on a specially designed test. Yet matching by race/ethnicity and gender did seem to have some relationship to the teachers' assessments of students' abilities. Assessments of this sort may relate directly to teachers' expectations of student, and may in turn contribute to improved outcomes. Villegas and Irvine (2010) suggest a teacher's expectations amount to a "self-fulfilling prophecy," shaping the interactions with students and ultimately leading to a positive or negative impact on student behavior, academic performance, and outlook (p. 180). A number of studies have found evidence that Black teachers expect more from Black students than do White teachers (Irvine, 1989; Gershenson, Holt, & Papageorge, 2016). Gershenson and colleagues, using a student fixed effects approach that examined teacher expectations data from

two teachers for each student, found that other-race teachers were 12 percent less likely than Black teachers to expect that Black students would complete a four-year degree.

Students also may benefit from exposure to teachers of the same race / ethnicity as a result of their having shared values, experiences, and beliefs (Grissom et al., 2015). Black teachers have the potential to serve as “cultural translators” for Black students through an understanding of the styles, mannerisms, speech patterns, and other characteristics of Black students (Irvine, 1989, p. 55). Irvine reports that effective teachers of Black students may use a speaking style that involves rhythmic speech, repetition, frequent body movements and other elements characteristic of Black preaching. Focusing on the need for more Black teachers, in particular, she suggests that teachers of color at their most effective function more as mentors than as role models. “Mentors are advocate teachers who help Black students manipulate the school’s culture, which is often contradictory and antithetical to their own” (Irvine, 1989, p. 53).

A representative teacher workforce may also benefit diverse students through the impact that teachers of color have on their colleagues. The simple fact of their presence could, for instance, discourage practices that disadvantage students of color, or they might through various interactions help other colleagues understand the needs of different types of students or use more culturally sensitive approaches (Grissom et al., 2015).

Finally, students of color and their families might act differently if they are exposed to a more representative teaching workforce. Students, for instance, might

feel empowered to ask for extra help, or they might work harder for a teacher considered a role model, while families might be more comfortable engaging with the school and requesting needed services and support (Grissom et al., 2015).

2.2.3 Teacher Diversity and Student Outcomes

Concerns about a lack of teacher diversity ultimately reflect concerns about the educational outcomes of students of color. Researchers have taken various approaches to look for evidence of the former's relationship with the latter, focusing in particular on four outcomes: student discipline, assignment to gifted education, assignment to special education, and academic achievement. The following sections explore the research literature in each of these areas.

Student Discipline

Students of color—particularly Black and Latinx students—are disproportionately likely to be expelled, suspended, or face other disciplinary penalties in school (Skiba, Horner, Chung, & Rausch, 2011). Various studies have found evidence that such penalties are less likely to be imposed at schools with higher percentages of teachers of color (Grissom, Nicholson-Crotty, & Nicholson-Crotty, 2009; Meier, 1993). Since these studies rely on teacher demographics at the school level, one challenge is to understand the influence of race apart from other factors associated with individual schools with distinctive conditions and cultures. Bates and Glick (2013) try to overcome this challenge by using a longitudinal data set—the Early Childhood Longitudinal Study Kindergarten Cohort of 1998-99 (ECLS-K:1998)—which provides teacher evaluations of the behavior on individual students

in kindergarten and in first, third, and fifth grades. They found evidence that Black students, overall, were more likely than non-Hispanic White, Hispanic White, or Asian students to be reported as having been disruptive (e.g. arguing, fighting, or creating other disturbances). Using a random-effects model, they examined whether teachers were more or less likely to describe students of the same race as disruptive, and found evidence that such a match was significant for Black teachers, but not for teachers of other races. What's not clear in the study is whether this results from differences in the teachers' impressions of student behavior or whether students might to some extent behave differently in the presence of teachers of the same race.

Instead of focusing on teacher perceptions of student behavior, Lindsay and Hart (2017) examined the patterns of suspensions and expulsions involving Black students at North Carolina public schools over the six-year period beginning in 2007-08. They confronted a similar challenge. Results from school-grade fixed effects model were apparently biased; while students with greater exposure to Black teachers were more likely to face these disciplinary measures, the researchers found evidence that sorting was occurring, with students who had disciplinary challenges in the past having a greater chance of being assigned to Black teachers in later years. Turning instead to a student fixed effects model, Lindsay and Hart estimated that Black students were less likely to face exclusionary discipline at schools with higher proportions of Black teachers. If the proportion of Black teachers were increased from the observed level of 22% to 50%, the researchers estimate, this effect would account for a ½ to 1% reduction in the likelihood of a Black student being suspended or expelled. The researchers also used an instrumental variables approach, exploiting

the varying likelihood of racial match resulting from differences by grade level in the proportion of teachers who are Black. This provided similar estimates as the student fixed effects model, though with slightly larger magnitudes and reduced precision.

To get at the question of whether this reduction in exclusionary discipline results from a change in student behavior or the actions of Black teachers (e.g. better overall classroom management or more likely to tolerate certain types of misbehavior) Lindsay and Hart looked at how often teachers of different races referred Black students for various infractions. That Black teachers were less likely to refer students for relatively minor matters like “defiance,” they suggest, may indicate they are more likely to use discretion in favor of Black students or to respond in a more proportionate manner. On the other hand, a reduction in referrals for violent acts at the elementary level—a case in which reporting is mandatory—may point to changes in student behavior in the presence of same-race teachers. The researchers acknowledge that these results are inconclusive and suggest that multiple mechanisms may be at work. Indeed, it seems likely there would be some interplay involving changes in student behavior and the ways that teachers respond.

Wright, Gottfried, and Vi-Nhuan (2017) provide evidence that Black and Latinx students exposed to teachers of color in kindergarten make substantial gains in their ability to control aggression and other problematic behaviors directed at other people. Using ECLS-K:2011 data, the researchers focused on the change from fall to spring of Black and Latinx students, relative to White students in reports of these *externalizing behaviors* made by teachers of different races. At the outset, the gap between students from either group and White students was about 0.27 standard

deviations. In the presence of a teacher of color, these students nearly closed this gap over the course of the school year, progressing by 0.26 standard deviations. The gains were particularly large, about 0.40 standard deviations, for Black students in the presence of same-race teachers.

Wright and colleagues focus in particular on the idea that these students may be benefitting from *cultural synchronicity*, or the ability of teachers of color to interpret students' behaviors based on their own cultural experiences and understanding. One result in particular speaks to this point. Latinx students who were also learning English progressed significantly in terms of behavior when taught by a Latinx teacher, yet they showed no such improvements when taught by a Spanish-speaking non-Latino teacher. Another possibility is that teachers of color may use distinctive teaching styles that are particularly effective with certain groups of students. For instance, Ware (2006), in a case study focusing on two Black teachers, explored the idea that these teachers' success with students of color resulted from their "warm demander" approach involving high expectations and the use of direct, authoritative communication. Rather than overlooking disruptive behavior or substandard work, both teachers would stop lessons to make their expectations clear, speaking sternly or even yelling to get the attention of the students, Ware reports, basing these findings on interviews and classroom observations. In one instance, the students "pleasantly and quietly" complied with instructions delivered in this way, speaking to the "caring and personal" relationship that had been established and the apparent belief on the part of the students that the teacher "raised her voice and demanded the homework as an indication of her concern" (p. 437).

Gifted Assignment

In 2009, White and Asian students together made up about 75% of the participants in the nation's gifted education programs despite accounting for only 60% of the students enrolled in the nation's public schools (U.S. Department of Education, 2010). The overrepresentation of these students was largely offset by the underrepresentation of Black and Latinx students. Black students, for instance, accounted for almost 17% of enrolled students but only 10% of those participating in gifted programs (U.S. Department of Education, 2010). Researchers have been aware of this gap for decades; Ford, Grantham, and Whiting (2008) note that studies published as early as 1936 reported that Black students were not being identified as gifted even if they had high intelligence test scores.

The widespread reliance on referrals to select students to be evaluated for gifted services puts teachers in the position of being gatekeepers (Donovan & Cross, 2002). It also raises the likelihood that representation effects may be at work; Grissom and colleagues (2015) suggest as a possible mechanism that teachers may be more aware of signs of giftedness in same-race students, perhaps as a result of shared backgrounds and experiences, and the implicit biases that may result.

A number of studies have found evidence that students of color are more likely to be selected for gifted programs in the presence of higher percentages of teachers of color (Rocha & Hawes, 2009; Grissom, Rodriguez, & Kern, 2017). Grissom and Redding (2016) used ECLS-K:1998 data to estimate the probability of students with teachers of varying races being assigned to gifted programs in reading

or math. Controlling for various school, teacher, and student characteristics, as well as student assessment test scores in reading and math, they calculated that the odds of Black and Hispanic students, respectively, being assigned to a gifted program were 66% and 44% lower than those of White students, while the odds for Asian students were 44% higher. With the inclusion of an indicator for a racial match of students and teachers, the probability of a Black student being selected for a gifted program in reading was estimated to be 6.2%, nearly triple the probability (2.1%) of a Black student being selected by a teacher of another race. (Matching the race of students and teachers did not yield statistically significant differences for other groups.)

Grissom and Redding's estimates showing the diverging probabilities of Black students being selected for gifted programs based on teacher race speak to one potential benefit of a representative teaching workforce. At the same time, as the researchers acknowledge, the study does not reveal whether the underlying mechanism relates to the behavior of teachers (e.g. differing expectations, lack of cultural awareness), students, or even family members, who might be more comfortable advocating for a child with a same-race teacher. Interestingly, Asian students were found to be overrepresented in gifted programs in spite of the limited supply in the sample of Asian teachers (1-2%, depending on grade level) relative to Asian students (3% of the students). While the researchers do not explore this difference, it invites consideration of circumstances when representation effects might be more or less important, perhaps because they are superseded by other factors (e.g. level of family involvement, diverging stereotypes for different groups and the implicit biases of teachers).

In their 2017 study, Grissom, Rodriguez, and Kern again focus on representation related to the participation of Black and Hispanic students in gifted programs, this time using school-level data. Combining data from the Schools and Staffing Survey (SASS) with information on gifted program assignment from a U.S. Department of Education Office for Civil Rights (OCR) survey, they explore the relationship between the diversity of gifted program participants and the racial composition of each school's teaching staff and also the principal's race. They found evidence, consistent with other studies, that higher percentages of Black and Hispanic teachers were correlated with higher rates of participation by Black and Hispanic students, respectively, in a school's gifted program. In addition, they found that having a Black principal was associated with a 3.8% increase in the participation of Black students in a school's gifted program. Significantly, they also stratified schools by percentage of Black and Hispanic teachers on the faculty to see if there are thresholds associated with higher participation rates for students from the two groups. In each case, the results show a sharp increase in gifted program participation for Black and Hispanic students as a faculty goes from having less than 20% of same-race teachers to more than 30%. The researchers argue this points to the possibility there could be a "critical mass" for representation to have an impact on student outcomes (Grissom et al., 2017, p. 416.) Additional analysis showing how other characteristics of schools vary at the different diversity levels—perhaps by further differentiating by setting or other characteristics—could be revealing.

Special Education

As with selection for gifted education programs, the process of referring students for special education services relies heavily on the judgment of teachers (Donovan & Cross, 2002; Skiba et al., 2008). In this case, students of color—and particularly Black students—are overrepresented among those who are referred for evaluation for special education services and also those selected to receive them (Donovan & Cross, 2002; Rocha & Hawes, 2009). This may result in the marginalization of students who would be better served by remaining in traditional classroom settings, and it presents another opportunity to investigate whether representation effects are at play.

Skiba and colleagues (2008) trace the origins of special education in the United States to the Jim Crow era, when notions regarding the intellectual inferiority of African Americans were used to justify segregated educational settings. As schools ostensibly took action to desegregate in the years following the 1954 *Brown* decision, “institutional structures, such as ability grouping and significantly separate special education classrooms, continued to keep minority students significantly segregated from their White peers” (Skiba et al., 2008, p. 265). The researchers present data from the U.S. Department of Education reflecting the relative risk of students from different racial and ethnic groups being identified as having a particular type of disability. Black students, the data show, are much more likely than students from other groups to be placed in the *mental retardation* or *serious emotional disturbance* categories—classifications that rely heavily on subjective reports from teachers and others—but less likely to be referred for conditions with a more objective basis,

including being deaf or blind. Latinx students, by contrast, are generally underrepresented for most disability types, though there's some evidence this pattern reverses in districts where they make up a high proportion of enrollment (Skiba et al., 2008).

The overrepresentation of African Americans and other students of color in special education programs is problematic to the extent additional services may be unnecessary or of low quality, or the students end up becoming discouraged or marginalized. Yet along with this risk of false positives—students placed in special education who may not need it—there is a risk that students who would benefit from the extra supports and services provided through special education may not receive them (Donovan & Cross, 2002). Since children of color are disproportionately likely to grow up in low-income households, they are more likely to be exposed to conditions, both prenatally and in early childhood, that are associated with developmental delays: poor nutrition, exposure to lead and other toxins, and less supportive home and childcare placements (Donovan & Cross, 2002).

In two review articles looking separately at the placement of Black students and that of other minority children (i.e. Hispanic, Asian, Native American, or language minority) in special education, Paul Morgan and colleagues (2016, 2018) find evidence that these students may actually be *underrepresented* among those receiving these services. In each article, the researchers synthesize 22 empirical studies exploring whether bias explains the overrepresentation of Black (2016) and

other minority students (2018).⁸ They conclude, in each case, that the majority of the studies failed to properly control for a range of confounders (e.g. student academic achievement, family income, parental education). The regression models in each review that were found to have the strongest internal and external validity produced estimates indicating that Black children and students from the other minority groups were consistently underrepresented among those referred for special education.

Morgan and colleagues (2016, 2018) note that they did not include in either review those studies looking at the relationship between teacher diversity and special education referrals. A number of studies (e.g. Rocha & Hawes, 2009; Meier, 1984; Meier, 1993) do provide some evidence that schools with larger proportions of Black and Hispanic teachers, respectively, have smaller proportions of same-race students identified as being “educable mentally retarded.” Some researchers have suggested this category has been misused as a means of separating minority students from regular classrooms (Donovan & Cross, 2002). While the findings are suggestive of representation effects, it is unclear whether this finding reflects a reduction in these schools of false positives or other factors.

Apart from questions of over- or underrepresentation, Donovan and Cross (2002) point to the need to further investigation regarding the availability of high-quality intervention for students of different races and backgrounds. Morgan and colleagues (2016), drawing on the public health literature, suggest the overrepresentation of White students receiving certain special education services may reflect the bias of clinicians as well as the comfort and success of White families in

⁸ While individual studies may have focused on identification of learning disabilities or other specific disability categories, the researchers do not distinguish between these categories in the analysis and report only on overall representation in special education.

securing appropriate treatment. Black parents, by contrast, may be more likely to take reports of problems at school as evidence of prejudice on the part of school officials (Yeh, Forness, Ho, McCabe, & Hough, 2004.) These diverging responses speak the potential significance of representation effects in special education placement, and also the need for greater specificity in exploring the quality and types of services available in different settings.

Academic Achievement

Education researchers have drawn on a range of data sources and taken varied approaches in looking for evidence that a racial/ethnic match (an also gender match, in some cases) between students and teachers is related to improved academic outcomes. Their results also vary widely, providing a complicated picture, but one that is suggestive of benefits in some cases.

Among the studies suggesting benefits, Klopfenstein (2005) found evidence that Black students who had a Black teacher for high school geometry, and particularly one of the opposite gender, were more likely to later take a rigorous math course. Dee (2004), using data from the Project STAR class-size experiment involving Tennessee students in grades 1-3, found evidence that Black and White students assigned to a same-race teacher saw improved performance on math and reading assessments. While Dee's 2005 study, which relied on a national sample of 8th-grade students who participated in NELS 1988, did not find evidence of improved performance associated with the racial match of students and teachers, it did reveal

that teachers consistently had more positive perceptions regarding the behavior of students of the same race and gender.

Pitts (2007) takes a similar approach, with the slight difference that he set out to examine the link between the overall representativeness of teachers and administrators in a district, and the performance of students. Using district-level data from Texas over the eight-year period ending in 2002, Pitts examined the relationship between the racial and ethnic representation of teachers and administrators in a district and a range of academic outcomes for students, including the pass rate on a statewide test, the Texas Assessment of Academic Skills (TAAS), that was required for high school graduation until 2003. The study did not find any statistically significant evidence that a representative administration improved student outcomes in terms of a reduced drop-out rates, TAAS pass rate, or increased college-bound rate. Pitts found relatively strong evidence, by contrast, that a representative teaching workforce, is associated with a reduced drop-out rate ($p < .10$) and an increased TAAS pass rate ($p < .01$). He notes these findings are consistent with the expectation that teachers, as street-level bureaucrats, are more likely to have a direct impact on student performance than are administrators.

The study also investigates the relationship between manager and administrator representation and the TAAS performance of students by race / ethnicity, finding strong evidence of a positive relationship between teacher representation and the pass rate for Black and Hispanic students ($p < .001$ in each case), and equally strong evidence that White students are less likely to pass the exam in districts with high teacher diversity (Pitts, 2007). The final result is interesting and

potentially concerning. Pitts suggests it could reflect unmeasured differences between districts where the representation of teachers comes close to mirroring the diversity of students, and districts where there is a greater lack of teacher representation, generally as a result of a disproportionately large number of White teachers. That districts in the former category were successful in attracting and retaining teachers of color, he continues, may reflect other activities and commitments that benefit students of color. Districts in the latter category, by contrast, may make less effort in these areas, effectively benefitting White students. While tempting, this explanation highlights the possibility that other factors may be at play, particularly given that districts may have relatively small or large diversity gaps for different reasons. Additional work looking at this relationship for districts of varying types (e.g. rural / suburban /urban, or highly / minimally diverse) might be revealing.

More recently, Egalite, Kisida & Winters (2015) estimated the effect on student achievement of having a same race teacher using a dataset including math and reading test results for almost 3 million Florida students who were in grades 3-10 over the seven-year period beginning in 2001-02. They linked these students with more than 92,000 teachers and used a student fixed effects approach to estimate the impact on student achievement of having had a teacher of the same race that year. Each of three models controlled for student and school characteristics (e.g. gender, free-lunch status, previous test results) and showed generally positive effects associated with a racial match. Using their preferred model, which controlled for teacher quality and also included a fixed effect term for specific courses, the researchers found small but statistically significant positive effects of racial match for

Black and White students in reading, and for Black, White, and Asian/Pacific Island students in math. The estimates were consistently negative, though of relatively small magnitude (0.009 standard deviations for reading, and 0.007 standard deviations in math), only for Hispanic students, a result the researchers discount because of the diversity of Florida's Hispanic population.

In contrast with the broad approach taken by Egalite and colleagues (2015), Yarnell and Bohrnstedt (2018) focused specifically on Black students to examine the relationship between teacher race and student performance on the 2013 National Assessment of Educational Progress 4th grade reading assessment. By using a multi-level modeling framework, the researchers were able to look at whether the relevant interaction between student and teacher race is at the student or classroom level, or both, and whether there's any variation by gender. They focus on test scores in reading because 4th grade is a level at which research has shown the achievement gap between Black and White students may be widening.

Consistent with other studies, Yarnell and Bohrnstedt found evidence that Black students who had Black teachers generally performed better than they did with other race teachers, particularly White teachers. The results also suggested that Black females, but not Black males, saw improved performance when they had Hispanic female teachers. The researchers speculate this result may be the result of intersectionality—Black females who are taught by Hispanic females may benefit by matching in some sense on both gender and being people of color. Black males, by contrast, may not see a benefit because they lack this additional connection point.

In general, studies examining the relationship between student-teacher racial matching and academic outcomes almost exclusively focus on student performance at a particular time during or after exposure to a same race teacher. In a promising discussion paper, Gershenson, Hart, Hyman, Lindsay, and Papageorge (2018) take a different approach, instead looking at long-run academic outcomes for Black students who had a Black teacher in grades K-3. The study relies on Tennessee's Project STAR, an experiment started in 1986 that randomly assigned participating kindergarten students and teachers to small and regular-sized classrooms. Project STAR's design also resulted in students being randomly assigned to teachers of different races and ethnicities, and the researchers were able to look at long-term outcomes by matching participants with data from the National Student Clearinghouse. The results are fairly striking: Black students who were randomly assigned to a Black teacher in grades K-3 were 5% more likely to finish high school and 4% more likely to enroll in college than were Black students who were not assigned to a Black teacher.

Finally, there is evidence suggesting that students of all races and ethnicities stand to benefit from a more diverse teacher workforce. Drawing on data from the Measures of Effective Teaching (MET) study, Cherng and Halpin (2016) found evidence that students across racial and ethnic groups have more positive perceptions of Black and Latinx teachers than they do of White teachers. An unusual aspect of the MET study is that it includes data from a survey in which students evaluated their teachers on how well they motivate students, manage their classroom, explain key concepts, and other factors. Focusing on grades 6-9, the researchers used a

hierarchical linear modeling approach that allowed them to control for work conditions and various student and teacher characteristics. The researchers found evidence across seven outcomes that Black and Latinx teachers were viewed similarly or more favorably than White teachers. With the inclusion of interaction terms involving student and teacher race and ethnicity, the researchers produced estimates suggesting that Black students have particularly favorable impressions of Black teachers, a result that is consistent with research described earlier (e.g. Egalite et al., 2015; Gershenson et al., 2018). The study has various limitations, including the fact the study only focused on six specific school districts in urban settings. It is also unclear how student assessments of teacher effectiveness track with other outcomes of interest to researchers, including academic achievement. Nevertheless, the results add to the already considerable evidence serving to motivate teacher diversification efforts.

2.3 Preparing Students of Color to be Teachers

2.3.1 Educating Teachers

While *Teach For America* and a range of other programs have emerged in recent years as alternative pathways for new teachers to enter classrooms and obtain certification, about 80 percent of new teachers still earn their credentials after completing a traditional university-based teacher preparation program (DeMonte, 2015). According to the American Association of Colleges for Teacher Education (AACTE), teacher preparation programs exist at about 2,300 colleges and universities in the United States (King, 2018). Goodlad (1990) describes the emergence in the

1840s and 1850s of the first of these programs with the establishment of Normal schools focused on the preparation of teachers. About a century later, the majority of these schools entered a period of rapid evolution in which they first became teachers' colleges and then were refashioned as regional state universities. The task of preparing teachers ceased to be the central role of these institutions as they expanded to offer majors across the academic disciplines. At the same time, schools of education that were established at public and private research universities beginning early in the 1900s offered a competing vision for education programs, one that valued research over the effective preparation of teachers. Despite this research focus, Goodlad (1990) notes that education faculty in these programs have struggled with their discipline's low status in the academic hierarchy, shifting enrollment patterns, and their institutions' broadening missions. Programs also emerged at private liberal arts colleges, benefitting in some cases from the focus at these institutions on undergraduate education, and private regional universities, some of which were created with an initial focus on education.

Darling-Hammond (2010) summarizes research highlighting the importance of the route through which a new teacher enters the classroom and the quality of the program he or she went through in terms of both teaching effectiveness and persistence in the profession. Certain alternative certification programs, for instance, offer only a brief period of training in the summer before placing participants in their own classrooms for on-the-job training. Many candidates are quickly overwhelmed: "Quite often these programs end up disrecruiting potentially great teachers instead of recruiting them," Darling-Hammond (2010) writes (p. 37). Pointing to studies in New

York and Louisiana, she highlights features of effective teacher preparation programs that include high-quality, extensive, and recurring field experiences in settings that match candidates' career plans; a high percentage of courses taught by tenured or tenure-track faculty; and a sufficient amount of coursework in teaching reading and mathematics. Many of the strongest programs have well-developed relationships with Professional Development Schools (PDS) that ideally provide aspiring teachers with sustained exposure to high-quality teaching (Darling-Hammond, 2010).

Research suggests effective university-based preparation programs may produce teachers who are more likely to stay in the profession and positively impact student performance. For example, a study of teachers in New York City found that students had the largest gains in academic performance when taught by teachers with strong academic preparation, who had completed a university-based teacher-education programs, and had at least two years of experience (Darling-Hammond, 2010).

In their broad review of the research literature, Cochran-Smith and colleagues (2015) divide teacher education studies into three underlying research programs. The first of these programs is concerned with teacher preparation pathways, policies, and effectiveness, while the second focuses on the experiences that prepare teachers to teach certain subjects. The third and final program is concerned broadly with issues of diversity in education, and it is further divided into four clusters. Studies in the first, and largest, cluster are focused on the preparation of teachers to work in diverse classrooms, while a smaller cluster includes studies focused on the recruitment and

preparation of teachers of color. The next two sections in this review track roughly with this division.

2.3.2 Teacher Education Programs and Diversity

Just as the teaching workforce is disproportionately White, so too are the aspiring teachers graduating from the country's education programs. As discussed earlier, data from the National Science Foundation's WebCASPAR system show that those completing 4-year degrees in education in 2015 were 66.4% White, 2.4% Asian, 10.5% Black, and 9.8% Hispanic /Latinx. This roughly parallels the underrepresentation of faculty of color in education departments. Three decades ago, Goodlad (1990) obtained survey responses from 1,217 education faculty at a national sample of public and private institutions of varying size and selectivity and found that more than 90% of respondents identified as White. (While this reflects the lack of diversity in the teaching workforce, education faculty differed from the ranks of aspiring teachers in terms of gender, with 60% of the respondents identifying as men, compared to a sample of future teachers in the study that was 80% female.) More recent data reflect some progress; in their study of faculty diversity at 40 selective public universities, Li and Koedel (2017) found that 68.7% of faculty members in departments of "educational leadership and policy" were White, making these departments the most diverse of the six disciplines studied. In comparison, the faculties in biology and chemistry departments were more than 80% White, with slightly greater diversity in departments of English (79.8%), sociology (76.6%) and economics (70.9%). Nevertheless, researchers describing their experiences as faculty

of color note the lack of diversity common among education departments (Dixon & Dingus, 2007; Ladson-Billings, 2005).

Beyond the numerical reality of White students and faculty being overrepresented in many education programs, various education scholars describe ways the practices and perspectives found within them reflect an orientation toward the needs and expectations of White students. Gordon (1994) points to “inertia of the teaching profession and its training programs” as a result of recruitment practices and criteria for selecting students that “perpetuate stereotypes based on the typical teacher at middle-class suburban schools” (p. 346). Sleeter (2001) describes the “overwhelming presence of Whiteness” that is encountered in most education programs, and argues it can be disorienting for students of color who enter such programs and are required to take multicultural education courses alongside their mostly White classmates (p. 101). Along the same lines, Sleeter and Thao (2007) suggest this “Whiteness” is wrapped up with the “mainly Euro-American values and perspectives” upon which many teacher education programs are based (p. 5).

To the extent that issues of diversity are raised in many teacher education programs, it is often from the perspective of type of preparation needed for White teachers to work in diverse settings. Indeed, this is a pressing issue given the reality of increasingly diverse public schools. In their review article, Cochran-Smith and colleagues (2015) note that this is an active field of research and that it represents the largest group of studies in the teacher education literature examining issues of diversity. In addition, they report, these studies were conducted by White researchers and focus on questions relating to the needs of mostly White teacher candidates as

they prepare to work in diverse settings. This “... attests to the challenge in preparing White, middle-class teacher candidates to teach students whose cultural and social biographies differ markedly from their own” (Cochran-Smith et al., 2015, p. 502).

Several education scholars of color have described their experiences within predominantly White departments. Ladson-Billings (2005) writes about instances in which her experiences and perspective were devalued even as she was called upon to take on the role of diversity expert. She also describes her experiences with colleagues who resisted hiring faculty candidates of color despite their being well qualified. “Thus the circle is unbroken—White teacher educators prepare White teachers who teach children of color who fail to achieve success in schools and are unable to pursue postsecondary education where they might become educators” (Ladson-Billings, 2005, p. 231).

Dixson and Dingus (2007) report on their experiences as two Black women professors at predominantly White institutions, and they highlight a not-so-subtle message that may be conveyed in overwhelmingly White teacher education programs when professors of color are called upon to teach the multicultural education courses. They write that they are perceived as symbols who focus on multicultural issues and can be called on to speak to the challenges faced by marginalized groups, and yet they also are regularly challenged by students who question their qualifications. “To see a Black woman professor represents the first time, for most of our White (and students of color) students that they have interacted with a person of color in a position of intellectual authority” (Dixson & Dingus, 2007, p. 644). Like Ladson-Billings, they point to a circularity that impedes efforts to increase diversity in the departments. On

the one hand, they note, the dominance of White perspectives means that courses in multicultural education often have minority status in programs and the value of hiring more faculty of color may not be recognized. At the same time, the lack of diverse faculty colleagues reduces the likelihood of White faculty members having the types of collegial interactions that might increase their understanding of multicultural issues.

Research on efforts to prepare teacher candidates for diverse settings have taken various approaches, with some studies focusing the effectiveness of certain programs in (1) reducing levels of prejudice or (2) teaching particular skills to work with diverse populations, and others investigating the (3) role of field experience and the (4) experiences of students of color (Hollins & Guzman, 2005). In reviewing the literature, Hollins and Guzman note a widespread limitation of many studies that focus on particular initiatives and yet lack discussion regarding the context of the particular teacher education programs within which these initiatives operate. Taken as a whole, the studies suggest a "...complex interaction among candidates' experiential backgrounds, the content offered in courses, and the pedagogical strategies candidates learn (or not)," Hollins & Guzman (2005) conclude (p. 512). Illustrating this complexity, Reed (2010) discusses the challenge of offering courses in multicultural education in rural areas that are diversifying, and yet face different challenges than do urban areas that are often at the center of discussions about multiculturalism.

2.3.3 Preparing Teachers of Color

While the research literature focused on preparing teachers for diversity is growing, Cochran-Smith and colleagues (2015) report that the “noticeable inattentiveness to the development of teacher candidates of color in this literature suggests that issues of recruiting, retaining, and preparing people of color for teaching are at the margins of mainstream teacher education research” (p. 508). Alongside this difference in focus, they observe another trend: While the bulk of studies examining the preparation of teacher candidates for diverse settings have been conducted by White researchers, much of the research examining the preparation and retention of teacher candidates of color has been conducted by researchers of color (Cochran-Smith et al., 2015). Most of these researchers have used qualitative and mixed methods in trying to understand the experiences and perspectives of these students.

Three qualitative studies (Su, 1997; Guyton et al., 1996, Canty, 2016) described in the first chapter, explored the experiences of students of color in master’s level teacher preparation programs. While the researchers found that students often reported feeling isolated in these programs, some found evidence of students’ relatively strong commitment to continuing in the teaching profession (Su, 1997). A potentially useful finding from Canty’s 2016 study is that students of color reported having more positive experiences during school placements when they did so in settings that reflected their own cultural and linguistic backgrounds.

A related finding emerged in Irizarry’s 2011 ethnographic study involving five Latinx students in a teacher education program at a PWI in the Northeastern United States. Four of the five students came from low-income backgrounds, and they

were required in the program to have a field experience at a school in a suburban area, an experience they believed bore little resemblance to the school settings they anticipated encountering as teachers, and in which they also encountered racially insensitive comments. Whatever the value of these field experiences, a lack of responsiveness from faculty members to whom they voiced their concerns contributed to a general feeling of being marginalized and silenced within the program. Students described experiences in the broader university setting that contributed to this feeling, including one instance in which a student going for lunch in a university cafeteria was yelled at by a manager who mistakenly thought he was an employee and that he was late for work.

The students also described the experiences in classes of alternately being either ignored or called upon to be, in the words of one, the “voice of Latino America” (Irizarry, 2011, p. 2818). In general, the students’ experiences point to the fundamental challenge of navigating an experience calibrated to the needs of White students who are meant to “figure out” enough about multicultural education to be successful in diverse classrooms (p. 2829). The need for these types of experiences, combined with limited interactions between White students and students of color in the program, magnified the study participants’ sense of being isolated and marginalized within the program.

Using a cross-case method to examine the perspectives of aspiring Latinx teachers at the high school and undergraduate levels and then as beginning teachers, Irizarry and Donaldson (2012) found evidence that, aside from these types of isolating and discouraging experiences, those who remained focused at the various

levels on pursuing careers in teaching often shared a common motivation. This often manifested as a desire to teach in a similar setting to the one experienced as a student and to help transform schools to the benefit of Latinx students.

Other researchers have found evidence that courses in multicultural education may have contributed to negative experiences for students of color. For instance, Amos (2016) conducted semi-structured interviews with four women of color after they completed taking a multicultural education course she taught at Central Washington University. Most of the students in the class were White, and the students of color she spoke with described a range of experiences ranging from racially insensitive to hostile. Notably, the students described their particular discomfort on occasions when it seemed that many of the White students in the class were bonding over their shared resistance to notions that race may unevenly confer advantages and disadvantages in different situations. Amos (2016), echoing Dixson and Dingus (2007), also describes several instances in which she, a person of color, felt students were treating her harshly and questioning her authority. Overall, this account is a chilling example of how a particular multicultural education course might have undesired effects for multiple groups. At the same time, Amos treats the course as a singular experience, with little discussion of the institutional context or other aspects of the students' experiences at the university or in the education program.

The experience of feeling isolated in teacher education programs is not unique to students of color. Bower-Phipps, Homa, Albaladejo, Johnson and Cruz (2013), an education faculty member and four students in a Connecticut teacher education program, describe experiences that may make students feel like outsiders according to

gender, sexual orientation, religion and other aspects of their identity. They note that a common and particularly isolating experience arises when a student is called upon by an education faculty member to serve as a spokesperson for a particular group or identity.

A similar concern emerged in Frank's 2003 study, which involved focus group discussions with seven Black women in a teacher education program at a predominantly White university. The women reported they often were called upon to represent Black people in general, and they also described experiences in which other students expressed negative stereotypes or made racially insensitive remarks. Frank's focus, however, was on the students' decision to pursue teacher certification at a PWI rather than an HBCU. Frank reports finding that the "Whiteness" was in some way part of the appeal, with participants explaining they felt a need for preparation to navigate in that setting, even as they struggled with experiences that made them feel isolated or different. Interestingly, Frank explores her own experiences as a White woman educator and researcher, commenting on her growing awareness of the ways her own racial identity shapes her interactions with students, and the need to be mindful of nuance.

A group of faculty at the University of Delaware used a mixed-methods approach to explore concerns about a lack of diversity in the university's teacher education programs (Flynn et al., 2015). Institutional data show the representation of students of color in these programs lagging increasingly far behind their enrollment in the entire university in the eight-year period ending in spring, 2013, when students of color made up 21.7% of the university's overall enrollment but just 10.3% of

enrollment in the education programs.⁹ The data also reveal that students from low-income backgrounds are underrepresented in the education programs (5.3% of student enrollment in 2013, compared to 7.5% for the whole university). Interestingly, the data reveal a fairly dramatic trend in the opposite direction first-generation college students, who go from being underrepresented in the education programs relative to the whole university in 2007 (2.3% compared to 3.9%) to overrepresented (11.2% compared to 3.7%). Unfortunately, the researchers do not include any discussion regarding the factors that might be involved in such an increase.

The researchers also looked at cohorts of students matriculating in 2007 and 2008 and found that students of color had lower four and five-year graduation rates (the averages of the two cohorts were 62.2% and 69.3%, respectively) from the teacher education program than did white students (averages of 73.4% and 81.7%). The pattern is repeated looking at graduation rates for the whole university, though the rates are somewhat lower for both groups (averages of 57.1% and 68.4% for students of color, and 70.0% and 79.1% for White students).

The qualitative portion of the study involved focus groups with current students and alumni of the teacher education program, interviews with education faculty members, and analysis of a university-wide survey of students from underrepresented groups that included responses from 102 teacher education majors. Among the themes emerging from the study were general concerns about the teaching profession (e.g. lack of prestige and low pay) and the need for academic, social and financial support to navigate the program, cope with its lack of diversity, and manage

⁹ The data are only reported for White students and in aggregate for students of color, so it is not clear if different patterns might exist among specific racial and ethnic groups.

various mandatory fees. They propose various solutions, including the establishment of scholarships for underrepresented students and broad efforts to promote the teaching profession (Flynn et al., 2015).

Another way teacher education programs may fail to meet the needs of students of color is by neglecting to focus on ways their classroom experiences as teachers of color might differ from those of their White peers. Achinstein and Aguirre (2008) conducted case studies of 15 new teachers of color over a three-year period and found evidence that many experienced “sociocultural challenges” from students questioning their authenticity or racial loyalty based on linguistic differences, economic background and other perceived differences. The teachers reported these experiences came as a surprise given the common assumption that they, as people of color, would be able to draw on a useful set of “cultural resources” to benefit students of color (Achinstein & Aguirre, 2008, p. 1308). While the teachers reported that they learned to turn these experiences into teachable moments, the finding highlights another way that teacher education programs, in focusing attention on the particular challenges that will confront White teachers, may be insufficiently mindful of the experiences of future teachers of color.

2.3.4 Programs Focused on Producing Teachers of Color

Focus and attention on the challenge of producing more teachers of color has waxed and waned in recent decades, as reflected in the programs described below and listed in Table 2.1.

Pathways Programs. An aggressive and wide-ranging attempt to address the teacher diversity gap and, more broadly, prepare teachers to work in urban settings

emerged in 1989 as the DeWitt Wallace – Reader’s Digest Fund established its *Pathways to Teaching Careers* initiative with \$50 million in grant funding (Clewell & Villegas, 2001). The initiative helped establish 26 programs on 66 college and university campuses in 26 states, with efforts to recruit and prepare new teachers focused on one of four groups: middle and high school students; undergraduates; paraprofessionals and non-certified teachers; and returned Peace Corps volunteers (Lau, Dandy, & Hoffman, 2007; Clewell & Villegas, 2001). In their 2001 evaluation of the initiative, Clewell and Villegas focused on programs in the latter two areas and concluded the programs succeeded in efforts to recruit diverse participants. (Out of 2,593 participants, 63% were from underrepresented groups, which is considerably more diverse than the 18% of newly prepared teachers nationally who came from these groups during the same time period.) Seventy-five percent of participants completed their teacher education program, and more than 80% of these program completers went on to teach at high-needs schools that had partnered with the program; school administrators rated these participants as being more effective than typical beginning teachers. Clewell and Villegas report a 3-year retention rate for these new teachers of 81%, exceeding the national average for new teachers of 71%, though this rate only takes into account the 812 Pathways participants who responded to a follow-up survey three years later, meaning the true retention rate might be considerably lower.

According to Clewell and Villegas (2001), successful programs that emerged out of the Pathways initiative (1) built strong partnerships with one or more high-needs school districts, (2) developed an effective process for identifying and

recruiting participants, (3) used innovative and culturally sensitive practices as part of a rigorous teacher preparation program, and (4) provided wide-ranging support to participants as they completed their degrees, worked to obtain certification, and entered the teaching workforce. The extensive list of support services employed by the programs includes orientation experiences, academic advising, tutoring, test preparation, supervised field experiences, mentoring, social and emotional support, cohort building activities, and financial support, along with job placement assistance, new teacher support, and networking activities for recent graduates.

One program emerging from the Pathways initiative for which considerable detail is available was established at Armstrong Atlantic State University (AASU) in 1992 with an initial \$600,000 grant and was focused on supporting teacher aides, substitutes, and other non-certified school employees interested in completing college degrees and becoming certified teachers. In a 2007 study emerging from the program, Lau and colleagues (2007) paid close attention to the selection process, which aimed to identify the “most committed individuals who seemed to have the necessary qualities to succeed as teachers and who would do whatever was necessary to succeed in the program” (p. 32). Over a period of roughly 15 years, the program had 105 graduates, and 85% of these newly prepared teachers were Black; 97 graduates of the program went on to teach at low-income schools in Georgia. Lau and colleagues report that these teachers were retained in classrooms at rates exceeding the national average, and they conducted a survey of past participants in an effort to identify factors associated with their retention as teachers. The researchers conclude, based on the survey, that the careful screening process used in the program allowed for the

identification of candidates with a deep commitment to teaching and serving their communities. The survey results also highlighted the importance for participants of the mentoring and social support they received, as well as the critical role that committed leaders played in giving participants the space and structure to succeed in the program.

The AASU Pathways program used many of the forms of support identified by Clewell and Villegas (2001), tailored to the needs of working adults, in many cases with children, who would be going back to complete college-level work. One creative design element involved making arrangements for all courses to be available on a single day each week; on those days, with the program participants absent from school, the university provided fourth-year teacher education students to serve in their place. While Lau and colleagues (2007) note that the program was sustained, and even expanded, over the years with additional grants, it appears to have become inactive in the years since; AASU became part of Georgia Southern University in early 2018, and no mention of the program is apparent on the website of the university, its college of education, or the college's office of Educational Outreach Partnership and Diversity.¹⁰

Other programs focused on increasing teacher diversity have apparently suffered a similar fate as a result of changing priorities, staff movements and losses of funding. For example, none of the programs started with DeWitt Wallace – Reader's Digest funding appear to have remained active, and the foundation—now the Wallace Foundation—describes the program as an early success, but notes the foundation's

¹⁰ See <https://coe.georgiasouthern.edu/partnerships/>

shift to focus on other areas, including arts education, summer and expanded learning, and educational leadership.¹¹

In their 2011 study of successful efforts to produce teachers of color, Sleeter and Milner describe three types of programs, including pipeline programs that involve partnerships between teacher education programs and feeder schools that are designed to encourage students, generally in middle and high school, to consider teaching careers. A second category includes university-based efforts that involve various forms of support for teacher candidates of color. A third category of redesigned teacher education programs includes more wide-ranging efforts that redesign program elements with the needs of would-be teachers of color in mind. Sleeter and Milner cite AASU's Pathways program, with a design focused on the specific needs of adult learners, as one example. Table 2.1 includes an additional category to provide examples of coordinated efforts at the state or other level that involve support across institutions.

Accounts of these programs vary widely in their methods and level of detail. In the review article by Sleeter and Milner (2011), about a third of the studies examined amounted to straightforward program descriptions, while most of the others were evaluations conducted by researchers associated with the program. These evaluations, including the one conducted by Lau and colleagues (2007), rely on program and institutional data combined in many cases with data from surveys, interviews, and focus groups. Sleeter and Milner (2011) located only a couple

¹¹ The Wallace Foundation, "A Brief History," <https://www.wallacefoundation.org/about-wallace/pages/history.aspx>

examples of external evaluations of these programs, including the evaluation of *Pathways to Teaching Careers* initiative conducted by Clewell and Villegas (2001).

Pipeline and Support Programs. Table 2.1 lists a dozen examples of teacher diversity programs and initiatives for which information is available, either on program websites or in the research literature, and includes four examples of pipeline programs. Dozens, or even hundreds of such programs exist across the country, with many providing activities and support to encourage middle and high school students, and particularly students of color, to pursue higher education and also consider teaching careers (Bianco, Leech, & Mitchell, 2011). The Pathways2Teaching program, started in 2010, is one example of this type of program. Students of color in grades 11-12 are from an urban area are invited to a university campus each week for a course focused on exploring social justice issues, college preparedness, and exposure to the teaching profession. Qualitative studies emerging from this program focus on the experiences and perspectives of Black male participants. Goings and Bianco (2016), for instance, report based on interviews with 22 Black male participants finding that many regard their teachers' low expectations of them and generally negative perceptions of the profession as barriers to their pursuing teaching careers.

Table 2.1: Programs focused on producing teachers of color

Program	Location	Host	Program Type	Setting	Years	Key program elements	Target population
Call Me MISTER (Mentors Instructing Students Toward Effective Role Models)	SC	Clemson University	Support	Large private university	1999 - Present	Tuition assistance, cohort model, academic support, job placement assistance	Male students of color from "underserved, underprivileged or economically disadvantaged backgrounds"
Charlotte Teacher Early College	NC	University of North Carolina at Charlotte	Pipeline	Large public university	2017-present	Multi-year program teacher pipeline program involving field experiences, coursework and mentoring	Diverse 8th grade students
CURE Program (Cortland Urban Recruitment of Educators)	NY	SUNY Cortland	Support	Small public university	1998 - Present	Specialized courses; mentoring; academic support; \$4,000 scholarship (10 each year)	SUNY Cortland students, with priority to students from underrepresented groups with commitment to teaching in high-need urban schools
Grow Your Own Teachers (GYO)	IL	Partnership	Coordinated	N/A	2006 - Present (largely inactive since state funding was lost in 2015)	Forgivable loans for tuition, books and fees (must teach 5 years in low-income school) + stipends for child care, transportation; academic support, test preparation	Parents, paraprofessionals and community leaders who are active school volunteers or are active in community; must have HS diploma or GED but not 4-year degree
Institute for Urban Education	MO	University of Missouri-Kansas City (UMKC)	Support	Mid-sized public university	2005 - Present	Cohort-based 4-year scholarship program in elementary and middle school education with focus on math, science and literacy, professional development; extra experiences in partner schools; requires commitment to teach for four years in KC partner district	HS students of color, particularly first generation and from urban schools
Newcomer Extended Teacher Education Program	ME	University of Southern Maine	Support	Small public university	1999 - Present	5th year teacher education program for immigrants with cohort-structure and mentoring (Ross, 2005, comments on importance of these elements for minority teacher candidates)	Recent immigrants and refugees
Pathways to Teaching Careers Program at Armstrong Atlantic State University	GA	Armstrong Atlantic State University	Redesign	Mid-sized university	1992 - unknown (no current information available)	Financial support, tutoring, mentorship, creation of "family-like atmosphere", workshops	Selection process focused on identifying diverse candidates with strong interest in teaching
Pathways2Teaching	CO	CU-Denver	Pipeline	Mid-sized public university	2010 - present	Weekly field experience with elementary students; college preparation; college credit mentoring; social justice emphasis	11th and 12th grade students of color
Project FUTURE	TX	Texas Tech University	Pipeline	Large public university	2005 - unknown (no current information)	Cohorts are invited to campus for day-long conferences focused on teaching; mentoring	Hispanic and African American students in grades 6-12
Recruiting Washington Teachers	WA	State agency	Pipeline	Multiple school districts	2008 - present	Offers grant support for Washington school districts, along with curriculum focused on encouraging participants to attend college and consider careers in teaching	Diverse high school students
Teachers of Tomorrow	MN	Minnesota State University Mankato	Support	Mid-sized public university	2010 - present	Weekly meetings; peer and professional networking; study groups and tutoring; school visits; mentoring	Designed a "diversity strategic recruiting plan"
The Multilingual / Multicultural Teacher Preparation Center (The M/M)	CA	California State University, Sacramento	Redesign	Large public university	1974 - (Center disbanded sometime after 2007)	Early advising, broad mentoring support (study group formation; financial aid, arranging for experiences, job placement)	Current and aspiring teachers interested in bilingual education

The table also lists several examples of programs designed to provide various forms of support to students of color as they seek to complete university-based education programs. Indiana University's Project TEAM (Transformative Education Achievement Model), described in Chapter One, is one such program. Established in 1996 with a focus on recruiting and supporting would-be teachers of color, the program provided scholarship support, mentoring opportunities, and a supportive community to cohorts of about 15 students (Bennett, 2002). Like many such programs, however, it appears to have become inactive in recent years.

One effort, promising in scale, is the Call Me MISTER Program, established at Clemson University in 2000. The program, which reports partnerships with 23 other campuses in South Carolina and with nine colleges and universities in other states, is focused specifically on recruiting and preparing Black males to become K-8 public school teachers (Jones, Holton, & Joseph, 2019). Like many support programs, Call Me Mister is based on a cohort model and provides financial support, mentoring, academic support, and job placement assistance. For each year of financial support that participants receive, they are expected to teach for at least one year. A 2012 book by Roy Jones, executive director of the program, and Aretta Jenkins provides a narrative about the need for the program and describes the experiences of various participants. In the 2019 paper, Jones and colleagues report that, at the time of writing, more than 90% of the 221 program alumni who completed certification remained in education, either as classroom teachers, administrators, or in higher education.

The Institute for Urban Education has received more rigorous attention (Waddell & Ukpokodu, 2012; Ukpokodu, 2015; Waddell, 2014). The program is based on a cohort model and offers four years of scholarship support to participants, who in exchange agree to teach for four years in a partner school district. Focused on math, science and literacy education at the elementary and middle-school levels, the program involves mentoring and academic support, professional development and extra experiences in partner schools. The program aims to recruit high school students of color, particularly from urban areas and first-generation college students, and reports having produced 52 graduates in four cohorts between 2005-2012, with 49% reported as people of color (Ukpokodu, 2015). In a qualitative study involving interviews with 51 participants in the program, Waddell (2014) identifies four key themes that students associated with their success in the program. These include the cohort model, the perception of the program's focus on diversity, high expectations, and support and interaction with faculty.

Redesign. AASU's Pathways program, described earlier in this section, is one frequently cited example of an initiative that involved the redesign of key elements of the teacher education program to meet the needs and fit the schedules of school staff members seeking to complete college degrees and become certified teachers.

Another oft-cited program is the Multilingual /Multicultural Teacher Preparation Center (The M/M Center) at Sacramento State University. Founded in 1974 with a focus on preparing low-income students from diverse cultural and linguistic backgrounds to become teachers, the center separated from the university's education department 1994 and became a department with eight core faculty

members (Wong et al., 2007). Wong and colleagues, professors in the program, describe a comprehensive approach to recruiting, supporting and guiding students that includes early advising and wide-ranging mentoring, including guidance on such matters as forming study groups, securing financial aid and finding opportunities to gain professional experience.

While the account provided by Wong and colleagues gives limited information about the number of students who went through the program, it describes the practices used in the center, as well as the priorities motivating them, in great detail. It also describes the challenges they and other core faculty members faced: establishing the center as its own department, though disruptive, ultimately provided flexibility and control regarding program design and faculty hiring.

The authors note that shifts in the state's political landscape, as well as hostility toward the center's multilingual and multicultural emphases, created various obstacles for the center. Notably, California voters in 1998 passed a law requiring English-only instruction. A follow-up article by three authors of the original paper cites a resulting decline in bilingual teacher candidates as one of the reasons the center was disbanded in a reorganization of the university's College of Education that occurred after the 2007 article was published (Murai, Berta-Ávila, and Figueróa-Ramírez, 2019). Other reasons listed include a push to cut costs and various disagreements among faculty members.

2.3.5 Institutional Change

The programs and initiatives described in this section, along with dozens of others that exist across the country, highlight a number of practices that have shown

promise in producing more teachers of color. Yet examination of these programs makes the daunting scale of the challenge clear: particular initiatives may thrive or disappear depending on whether funding remains available, institutional priorities remain constant, the political landscape changes, or key faculty or staff remain in place. At the same time, a dramatic increase in the number of programs and their productivity would be required to substantially close the teacher diversity gap. Calculations by Putman and colleagues (2016), for instance, suggest that producing a teacher workforce that reflects the diversity of students would require the outright replacement of about 1,000,000 White teachers with an equal number of teachers of color, most of them Black or Latinx.

This study draws on insights from these initiatives while at the same time seeking to understand factors related to the retention of students of color in a teacher education program in the context of the broader institutional culture. The social transformation theory of change proposed by Maton and colleagues (2008) highlights the importance of taking this type of broad approach. One insight is that narrow and focused diversity initiatives may have limited impact as they run up against cultures that are resistant to change. The transformational approach calls for insights that go beyond simple representation to an understanding of the academic performance of different groups.

The theory is based on an understanding of the complexity of higher education institutions. Change may then be understood as a multi-dimensional process involving systemic, bureaucratic or structural, collegial, political, and symbolic dimensions (Maton et al., 2008; Williams, Berger, and McClendon, 2005). The

challenges sustaining change initiatives described earlier in this section may be understood as breakdowns relating to one or more of these dimensions. The reality of institutional hierarchies requires that change initiatives align with campus priorities and even have active support from campus leaders (Williams, Berger, and McClendon, 2005). At the same time, change occurs within the context of shifting political and legal imperatives, and changing demographic and economic realities.

The challenge of producing significantly more teachers of color will clearly require colleges and universities to make broad programmatic and institutional changes in their teacher education programs so that they meet the needs of students of color and help them succeed. The social transformation theory of change points to the value of using insights regarding student experiences and academic performance in the education program to guide the change process.

Chapter 3: Methods

While specialized programs focused on producing teachers of color will certainly play a role in efforts to reduce the size of the teacher diversity gap, there is also a clear need for additional insights regarding the perspectives and experiences of aspiring teachers of color in university-based preparation programs. Such insights have the potential to be of considerable value in guiding change efforts within the context of institutional complexity and limited resources. This chapter will detail the approach used in this mixed methods study exploring the experiences, perspectives and outcomes of students of color in a teacher education program at a public research university.

3.1 Research Design

The use of mixed methods in this study is particularly appropriate given both the strengths and potential limitations of the quantitative and qualitative methods to be used. On the quantitative side, student-level institutional data provide the essential backdrop for the study, with analysis aimed at highlighting patterns related to success and persistence in the teacher education program. This analysis is essential for the study, and yet of limited usefulness in the absence of additional data regarding the experiences, motivations, and perspective of students of color in the program. The qualitative and quantitative components of the study enriched and informed the other through an enquiry focused on the following four research questions.

- i. What factors are associated with students of color at a public research university completing or leaving a teacher education program?

- ii. How do teachers of color who earned their teaching certification at a public research university describe the experiences that they believe contributed to their persistence in the program?
- iii. How do teachers of color who earned their teaching certification at a public research university describe the challenges, if any, that they encountered while enrolled in the program?
- iv. How do students of color who started, but did not complete, the teacher education program at a public research university describe their experiences in the program and their decision not to continue?

To address these questions, this case study used a mixed-methods, pragmatic approach (Johnson & Onwuegbuzie, 2004). As noted by Cresswell, Plano Clark, Gutmann and Hanson (2003), such methods may be particularly useful in investigations into complex social phenomena. At the outset, student-level institutional data were used to explore differences in student performance and persistence according to race, gender, academic preparation, and other characteristics. Institutional data served as a guide for focus group discussions and semi-structured interviews involving a group of students who completed the teacher education program and another that did not; qualitative findings from the focus groups, in turn, informed the data analysis and development of additional research questions for future analysis.

The approach thus combined elements of both the triangulation and explanatory designs described by Cresswell and Clark (2007). Studies in the former category aim to “bring together the differing strengths and nonoverlapping weaknesses” of the two methods, with the goal of being able to compare and contrast the results derived from each (Cresswell & Clark, 2007, p. 62). At the same time, the

qualitative portion of the study added an extra layer of insight to the quantitative results, reflecting the explanatory design. Weitzman and Levkoff (2000) illustrate this approach in their study looking at dementia caregiving involving minority elders. Qualitative methods, they write, may provide insights regarding cultural factors related the experiences and outcomes being studied, and yet they may be weakened as a result of a lack of well-established procedures to ensure reliability and the possibility of bias introduced through an interviewer's own projections. Pairing such an approach with quantitative methods, which may lack the cultural sensitivity, may thus result in a combined approach that overcomes the respective shortcomings of each (Weitzman & Levkoff, 2000).

Leech and Onwuegbuzie (2006) place mixed methods studies on a continuum according to the time and degree to which each approach informs and guides the other. Single method studies, whether qualitative or quantitative, sit at one end of the spectrum, while the full mixing of two methods at multiple stages of the study at the other. The methods used in this study have a place on this continuum somewhere between "partially" mixed methods—where methods come together chiefly in the process of interpreting the data—and fully mixed methods. (Leech & Onwuegbuzie, 2006, p. 267). Specifically, data from the two methods have roughly equal status in the study, and collection and analysis of quantitative and qualitative data proceeded concurrently. While preliminary insights obtained from each method informed the analysis in some cases, most of the mixing occurred during the interpretation phase.

3.2 Setting

UMBC is a mid-sized public research university with about 11,000 undergraduates and 2,500 graduate students. More than half of the university's undergraduates complete majors in science, technology, engineering, and mathematics (STEM), and the university is highly diverse, with White, Asian, Black and Latinx students accounting, respectively, for 41%, 22%, 18% and 7% of undergraduate enrollment (UMBC Common Data Set 2017-18). The university is nationally recognized for the success of its Meyerhoff Scholars Program, which is focused on preparing students from underrepresented groups—particularly African Americans—to become research scientists and engineers. UMBC now leads the country in producing African American graduates who go on to complete MD/PhDs (Hrabowski and Henderson, 2017), and the university has built its identity around the concept of inclusive excellence. According to the social transformation theory of change proposed by Maton et al. (2008), efforts to increase the achievement and retention of students of color in higher education benefit from the creation of empowering community settings, grounded in an understanding of students' unique assets and needs, at institutions with a stated commitment to inclusive excellence. Likely as a result of the Meyerhoff program and other university initiatives focused on student success, UMBC sees little difference in certain academic outcomes for specific groups. For instance, the university's average 6-year graduation rates for students who started as first-time full-time freshmen in the five academic years beginning in 2007 were 64.0% and 62.2% for White and Black students, respectively. In contrast, the national average 6-year graduation rate for students who started in

2008 were 63.2% and 40.9% for White and Black students, respectively (U.S. Department of Education, 2016b).

While UMBC may stand out for having similar outcomes across racial groups according to this one metric, variations among groups may exist in specific disciplines, including education. Though the university does not offer a stand-alone education major, it offers undergraduate coursework leading to certification in early childhood, elementary, secondary, English for Speakers of Other Languages (ESOL), and K-12 education programs in music, dance, art and foreign language. The education department also offers a similar sequence of courses leading to a Master of Arts in Teaching (MAT) degree. The undergraduate and graduate courses are generally cross-listed, with graduate students required to complete additional assignments. The department currently has 19 tenured, tenure-track, and clinical faculty members. Each year between 2005 and 2017, an average of 38 undergraduates and 44 MAT students completed the coursework required for certification, with the numbers declining slightly in recent years (UMBC data).

The education program, particularly at the undergraduate level, is markedly less diverse than the university as a whole, and as such comes closer to reflecting the diversity of the teaching workforce. The students completing UMBC's undergraduate teacher preparation program in the past 13 years, for instance, were 74.9% White, 6.7% Black, 3.3% Latinx, and 9.8% Asian. (MAT recipients were 65.7% White, 16.8% Black, 3.3% Latinx, and 5.2% Asian.) Greater diversity among students taking the first course in the undergraduate education sequence—preliminary data indicated these students were 60.5% White, 12.6% Black, 5.4% Latinx, and 13.6% Asian—

served to motivate this study. That this apparent drop-off occurs at a university with a strong stated commitment to inclusive excellence makes it an interesting setting within which to explore the factors specific to the teacher preparation program that may make it more or less likely for students of color to persist.

Based on the success of the Meyerhoff Program, the university has developed several other specialized scholarship programs, each focused on a particular societal challenge. The basic approach in each case involves the use of a cohort model, scholarship support, mentoring, and social, academic, and career support. Of particular relevance in this study is the Sherman STEM Teacher Scholars Program, which was established in the 2007 with the goal of preparing experts in math and science to teach in high-needs schools in the Baltimore region and across Maryland. The program is open to incoming freshmen, transfer students and other undergraduate students who become interested in teaching during their time at the university, and most recently, it is open to graduate students in MAT programs. Though it is not explicitly focused on producing teachers of color, teachers prepared through the program tend to be more diverse than the broader group of unaffiliated students pursuing certification in the education program. Table 3.1 provides details regarding the race/ethnicity and gender of students who have participated in Sherman program over its history (2007-2018).

Table 3.1: Race/ethnicity and gender of UMBC Sherman scholars, 2007-2018

	Number	Percentage
<i>Race/ethnicity</i>		
White	98	52.1%
Black	35	18.6%
Asian	32	17.0%
Hispanic	12	6.4%
Other URM	11	5.9%
Male	51	27.1%
Total	188	100.0%

3.3 Participants and Program Details

The design of the study met the criteria for exemption from the university's institutional review process. Specifically, the quantitative portion of the study makes use of data that is routinely collected at an educational institution, and it is focused on improving educational practices. In the qualitative portion of the study, the topics to be explored in interviews and focus groups with alumni did not cover topics considered "sensitive," and as such participation was not expected to pose any more than minimal risk to participants. The university's Institutional Review Board granted an exemption from full board review in October, 2018. Procedures used to allow participants in the qualitative portion of the study to provide informed consent are described in the section on data collection, below.

Quantitative

The quantitative portion of this study explores differences in student persistence in the education program according to race and other characteristics among those who indicated in some way an initial interest in completing certification and pursuing a teaching career. The lack of an education major at UMBC presents a challenge in this respect as it removes one possible mechanism through which incoming undergraduates and those selecting or changing majors could signal an interest in teaching. Graduate students, by contrast, clearly signal their interest in teaching by applying to and beginning the MAT program.

Given the lack of an education major, the study instead relied on course-taking behavior as a signal of a student's potential interest in teaching. Table 3.2 lists the courses used in this study to register student interest in teaching (introductory courses) and track progress in the three major tracks leading to teaching certification. At the introductory level, EDUC 310 and 601 are the first required courses, respectively, open to new undergraduate and graduate students beginning the program leading to certification. At the undergraduate level, transfer students may be able to waive EDUC 310, and thus EDUC 412, a required course for all three tracks, is included to identify students who may have entered with advanced standing.

Table 3.2: Introductory and significant courses for different education pathways at UMBC

Introductory Classes

EDUC 310 Inquiry into Education
EDUC 412 Analysis of Teaching and Learning
EDUC 601 Human Learning and Cognition

Elementary Education

EDUC 421 Teaching Science in Elementary School
EDUC 623 Instructional Strategies / Teaching Elementary Science
EDUC 452 Internship in Elementary Education, grades 1-6
EDUC 793E Internship in Elementary Education, grades 1-6

Early Childhood Education

EDUC 439 Observation and Assessment in ECE
EDUC 679 Observation and Assessment in ECE
EDUC 450 Internship in Early Childhood Education P-3
EDUC 792E Internship in Early Childhood Education P-3

Secondary and K-12 Education

EDUC 410 Reading in the Content Area I
EDUC 658 Reading in the Content Area I
EDUC 456 Internship in Secondary Education
EDUC 793S Internship in Secondary Education

For each of the three tracks—elementary education, early childhood education, and secondary / K-12 education—the study relied on two courses at the undergraduate and graduate level to gauge progress in the program. The first two courses listed for each track (EDUC 421/623, EDUC439/679, and EDUC 420/658, at the undergraduate and graduate levels, respectively) are required courses that students take as they begin completing requirements for their chosen pathway; the final two courses are the capstone internships for each track (EDUC 452/793E, EDUC450/792E, and EDUC 456/EDUC 793S). For the analysis of undergraduate

persistence in the education program, participants in the study are the 717 students who started their studies at UMBC during any of the six academic years from 2008-09 through 2013-14 and also took one or more of the undergraduate education courses listed above during the 10-year period ending in 2017-18. For the graduate analysis, participants are the 376 students who enrolled in the MAT program in the eight academic years from 2008-09 through 2015-16. This approach takes advantage of this 10-year period being one in which the education curriculum did not change significantly. The differing number of years included in the analysis reflects differences in average time to completion in the undergraduate and graduate programs: 90.4% of students in the undergraduate sample who complete a bachelor's degree do so in five years or less, whereas 93.5% of MAT students who complete the program do so in three years or less.

Table 3.3: Sample demographics

	All	MAT	Undergraduates	
	Undergraduates	Program	Freshmen	Transfers
<i>Race/ethnicity</i>				
White	0.632 (0.018)	0.614 (0.025)	0.643 (0.029)	0.625 (0.023)
Black	0.119 (0.012)	0.090 (0.015)	0.093 (0.017)	0.135 (0.016)
Asian	0.113 (0.012)	0.066 (0.013)	0.164 (0.022)	0.080 (0.013)
Hispanic	0.059 (0.009)	0.045 (0.011)	0.054 (0.013)	0.062 (0.012)
Other URM	0.022 (0.006)	0.024 (0.008)	0.014 (0.007)	0.027 (0.008)
International	0.018 (0.005)	0.019 (0.007)	0.011 (0.006)	0.023 (0.007)
Unknown/Unspecified	0.038 (0.007)	0.138 (0.018)	0.021 (0.009)	0.048 (0.010)
Male	0.304 (0.017)	0.287 (0.023)	0.329 (0.028)	0.288 (0.022)
N/n	717	376	280	437

Standard errors in parentheses

Note: Welch's t-test was used to compare the sample means for undergraduate and MAT students, and also for freshmen and transfer students. **Bold** print indicates instances in which differences in the means were statistically significant at the $p < .05$ level.

Qualitative

The qualitative portion of this study relied on interviews and focus groups discussions with students who either (1) graduated from UMBC in the past six academic years having completed undergraduate or MAT program coursework required for certification and entered the teaching profession or (2) enrolled in courses in either program during the same time period without completing the full sequence. Given the goal with these focus groups of gaining a rich understanding of students' experiences in the teacher education program, and also the relatively limited number of students of color who have completed the program during the proposed time period, non-random sampling techniques were used to identify potential focus group participants (Onwuegbuzie & Leech, 2007). Potential participants were identified using institutional data along with faculty and staff recommendations. Recruitment proceeded using a combination of convenience and snowball, or network, sampling techniques (Onwuegbuzie & Leech, 2007). Participants, once identified through recommendations or institutional records, were invited to suggest others who may have insight regarding the factors associated with persistence in the program or departure from it.

The original plan had been to gather qualitative data through two focus groups with alumni who completed certification at UMBC, and a third with alumni or former students who did not complete certification. It quickly became clear that scheduling difficulties and a lack of reliable contact information for many alumni and former students would require another approach. In the end, five alumni who completed the teacher preparation program at UMBC participated in one of two focus group

Table 3.4: Characteristics of qualitative study participants.

<i>Pseudonym</i>	<i>Race/ethnicity</i>	<i>Gender</i>	<i>Affiliation</i>	<i>UMBC degree(s)</i>	<i>Major</i>	<i>Track</i>	<i>Current occupation</i>
<i>Completed program</i>							
Lara	Black	Female	Sherman	BS, MAT	Biology	Elementary	Elementary school teacher
Kierra	Black	Female	Sherman	BA	Chemistry	Secondary	HS chemistry teacher
Katie	Asian	Female	Sherman	BS, MAT	Biology	Secondary	HS biology teacher
Toni	Mixed, Latinx	Female		BA, MAT	Political Science	Secondary	HS social studies teacher
Jake	Asian	Male	Sherman	BA, MAT	Math	Secondary	HS math teacher
Marie	Black	Female	Sherman	MAT		Secondary	Middle school math teacher
Tanya	Black	Female	Athlete	BA	Media & Communications	Early Childhood	Elementary school teacher
Rudolph	Black	Male		BA, MAT	History	Secondary	HS social studies teacher
<i>Did not complete program</i>							
Eimash	Asian	Female	Sherman	BS	Math	Secondary	HS math teacher (alternative certification)
Asia	Black	Female	Sherman	BA	Political Science	Special Education	Elementary school teacher (alternative certification)
Marcus	Black	Male	Sherman	MAT		Secondary	Employed outside education
Lily	Black	Female	Sherman	BA	Psychology	Secondary	Pursuing MAT degree at another institution

discussions held on campus. Three additional program completers participated in the study through semi-structured telephone interviews.

While lists provided by the Education Department and Sherman program included a number of alumni who did not complete UMBC's education program, it proved markedly more difficult to make contact with them and secure their agreement to participate in the study. Ultimately, four alumni representing a range of perspectives and experiences agreed to participate individually in semi-structured interviews via the telephone or videoconference (Skype). The twelve interview participants in the study are listed in Table 3.4, along with descriptive information about each.

3.4 Data Collection

Quantitative

Most of the data for the quantitative portion of the study was provided by the university's department of Institutional Research, Analysis, and Decision Support (IRADS), which maintains a data warehouse containing demographic information for enrolled and former students, along with details regarding course taking and performance, degree completion, and other factors. IRADS provided data in three separate files. The first is a list of all instances during the 10-year period ending in 2017-18 in which a student enrolled in one of the courses listed above and received a mark. (Since students who drop a class within the first two weeks of the semester do not receive any kind of mark, cases in which a student quickly decided not to take a class would not show up in these data.) This file provides grades and basic instructor demographics (gender and race/ethnicity) for 4,230 courses taken by 2,141 students

over the specified period. The file also contains a variable for “attemptnumber.”

While almost 99% of the entries in the file are first attempts, 55 are second attempts and there is a single instance of a student taking a course for a third time.

IRADS also provided separate files for undergraduate and graduate students, each with a range of demographic, personal, and academic details. The file for the undergraduates includes information for all students who as undergraduates took one or more of the courses listed in the courses file. The file includes a broad range of variables related to students’ backgrounds (e.g. race/ethnicity, gender, last school attended, county of origin), academic preparation (e.g. standardized test scores, GPA at last school attended) and academic outcomes (e.g. degree completion, major subject). IRADS, citing current guidance from the U.S. Department of Education, was not able to provide financial aid data reflecting students’ eligibility for Pell Grants or their receipt of other grants or scholarship awards. One potentially useful item reflecting students’ socioeconomic background became available for students who matriculated beginning in the 2013-14 academic year and applied for admission using the Common Application. The application added a question that year asking applicants if they would be in the first generation in their families to receive a bachelor’s degree. Out of 97 students in the sample who applied in 2013-14, first generation information was available for 83 of them; 40% of these students reported first generation status. Unfortunately, the availability of the first-generation indicator for a single year severely limited its usefulness in the analysis.

The graduate file, which includes records for 376 students who enrolled in the MAT program between fall 2008 and spring 2016, is much more condensed,

providing information only on student demographics (gender and race/ethnicity), enrollment status (full or part-time), and a range of variables related to persistence and degree completion. As with the undergraduate file, the graduate file includes a “first generation” indicator. However, the indicator was of limited usefulness in this study given that information is only provided for the 11 students in the sample who also attended UMBC as undergraduates and used the Common Application to apply since 2014.

Since UMBC does not offer a bachelor’s degree in education, the original plan for the study had been to rely on completion of the appropriate internship course as a proxy for program completion. To complete the program, however, teacher candidates must also pass the Educational Testing Service’s Praxis II exam covering content knowledge in a particular area. The Education Department maintains lists for each academic year of those who take the exam and completed all the other state requirements to obtain certification. These lists were provided by the department and permitted the use of “program completion” as an additional outcome variable.

Qualitative

Before each focus group and interview, the study’s informed consent document was distributed to participants electronically, and each session started with a discussion of key aspects of the document, including the purpose of the study, the confidentiality of the information to be collected, the procedures to be followed, and the understanding that participation was voluntary. The participants acknowledged that the discussion would be recorded for the purpose of developing an accurate

transcript of the session and supporting further analysis. After having an opportunity to ask questions, the participants signed and returned the document or, in the case of those participating remotely, indicated they would be sending the document after the discussion. Participants were also asked to complete brief information sheets recording their names, preferred pseudonym, major(s) and year(s) of graduation, track in the education program, scholars program affiliation, and current teaching position, if any. With participants' permission, a digital recording device was then activated, and participants provided verbal approval for the recording to be made.

The two focus groups were held on the UMBC campus and lasted about 90 minutes each. While four alumni were expected for the first focus group, which was held on a week-day evening, one cancellation and another no-show brought the group to two. There was one cancellation for the second focus group, resulting in three participants in that discussion, which was held on a Saturday afternoon. Refreshments were provided on each occasion, and the discussions followed the basic structure of the study's focus group / interview protocol (see Appendix A), with time for follow-up questions and discussion among participants. At the conclusion of each session, the recording device was stopped, and participants were thanked and reimbursed for parking expenses they incurred, if any.

The seven semi-structured interviews ranged in length from just under 30 minutes to slightly more than an hour, and used the same interview protocol used for the focus groups. Five of the participants chose to proceed with a phone conversation, while two opted instead to talk by means of the internet video application Skype. (Only audio was recorded during these interviews.)

Audio recordings from the seven semi-structured interviews and two focus groups were transcribed using the online transcription service rev.com. The transcripts were then verified and updated through a complete review of each audio file.

3.5 Data Analysis

Quantitative

The quantitative portion of this study is focused on addressing the first research question: *What factors are associated with students of color at a public research university completing or leaving a teacher education program?* The data were provided in four separate files, and as such the analysis proceeded stepwise.

The *courses* file contained no demographic information about students, but instead was a simple list of each instance in which an education course of interest (see Table 3.2) was taken between fall 2008 and spring 2018. Students in the file were identified by a unique 10-digit ID number. Given the need to eventually prune the file down to a single entry for each student, the approach moving forward was to generate a series of indicator variables recording information related to course outcomes and experiences. Stata's "egen" command was then used to apply the same value of the indicator for each instance in which a particular student appeared in the data set. Variables created in this way included indicators for each of the three education pathways (early childhood, elementary, and secondary/K-12), whether or not a student had an African American faculty member as the instructor for one of their courses, and the outcome variable *internship* reflecting whether or not a student

passed the internship course in one of the three tracks with a grade of B-minus or higher.¹²

The Education Department also tracks by academic year those students who pass the appropriate internship and other requirements for completion of the education program, including passing all required classes with a grade of ‘B’ or better and, for undergraduates, completion of the university’s requirements for graduation and completion of their major. In addition, to be considered program completers, they also must pass the Praxis II subject area examination required for teachers to become certified in Maryland. The department’s lists of these program completers were combined into a single file containing only the ID numbers of the alumni, and this file was imported into Stata for the purpose of merging it with student-level data and allowing for the creation of the outcome variable *completed*, reflecting whether or not a student satisfied all of the official requirements for program completion.

As described above, the strategy for examining completion rates for undergraduates in the education program involved casting a wide net to include all of the students who took any of the classes listed in Table 3.2 during the 10-year period from fall 2008 to spring 2018. As a result, the data file for undergraduates initially included 1,381 students, many more than would be part of the final study sample. Students who matriculated before the 2008-09 academic year were dropped to be sure that those appearing in the sample would have had the opportunity to take the full range of courses. Similarly, the sample was cut off for students beginning after the 2013-14 academic year, allowing a reasonable 5-year period for the latest cohort to

¹² The indicator variable reflecting whether a student had an African American instructor ultimately was not useful in the analysis given it applied to a very small number of students (3.5% of undergraduates and 0.3% of MAT students).

progress through the program. (Of the 214 program completers included in the final sample of 717 students, 92.8% graduated in five years or less.)

The sample of undergraduates included both students who entered as first-time freshmen and those who transferred from a 2-year or 4-year institution. The primary control variables reflecting the academic preparation of entering freshmen included high school GPA and total score on the math and verbal portions of the SAT. SAT scores and high school GPAs were generally lacking for transfer students; instead, the variables controlling for the academic preparation of transfer students included the number of credits accepted for transfer at UMBC and the students' cumulative GPA in those courses.

While financial aid data were not available, two variables reflecting types of academic, social, and financial support utilized by students were used in the analysis. The first of these, denoted "Affiliate," indicates that a student was a participant in any of a number of non-merit based programs or activities, including service-learning activities and Living-Learning Communities oriented around various interests. A list of Sherman participants was used to generate a second variable indicating students who received academic, social, and financial support through the program.

Other key variables included in the analysis include indicators for gender, whether a student is from a state other than Maryland, whether the last school attended was private, and whether a student started at the university in the spring semester rather than taking the more traditional route of starting in the fall. After removing students with missing data, the final undergraduate sample of 717 students included 280 students who entered as freshmen and the 437 transfer students.

Characteristics of these groups, both in aggregate and separated by race and ethnicity, are provided in Table 3.5. Data on course taking and program completion were added to the undergraduate file through two separate merges.

The file containing information about graduate students was considerably more sparse, limited primarily to information about race / ethnicity, gender and enrollment status over time. Absent from the data were any variables related to academic preparation. As with the undergraduates, students were excluded from the graduate sample if they started in the program before the start of the study period. The sample was also restricted to those who matriculated during or before the fall semester of the 2015-2016 academic year, allowing three years for students in this final cohort to advance to program completion. (In the final sample, 91.6% of students who completed a master's degree did so in three or fewer years.) As with the undergraduate file, data on course taking and program completion were then added to the graduate file through two separate merges. Characteristics of the graduate sample appear in the final panel of Table 3.5.

Table 3.5: Sample Characteristics

FRESHMEN	Race/Ethnicity							
	All	White	Black	Asian	Hispanic	Other URM	Internat.	Unknown
SAT Score	1,191.0 (8.098)	1,214.8 (10.365)	1,113.1 (15.785)	1,166.7 (18.130)	1,102.0 (28.136)	1,247.5 (81.381)	1,136.7 (123.468)	1,213.3 (41.526)
High School GPA	3.695 (0.027)	3.733 (0.034)	3.596 (0.091)	3.591 (0.055)	3.708 (0.142)	3.923 (0.124)	3.678 (0.286)	3.610 (0.197)
Male	0.329 (0.028)	0.367 (0.036)	0.385 (0.097)	0.217 (0.061)	0.267 (0.118)	0.250 (0.250)	0.333 (0.333)	0 .
From other state	0.093 (0.017)	0.094 (0.022)	0.077 (0.053)	0.043 (0.030)	0.133 (0.091)	0 .	1.000 .	0 .
Attended private school	0.161 (0.022)	0.167 (0.028)	0.231 (0.084)	0.065 (0.037)	0.200 (0.107)	0 .	0.333 (0.333)	0.333 (0.211)
Sherman	0.089 (0.017)	0.089 (0.021)	0.115 (0.064)	0.065 (0.037)	0.133 (0.091)	0.250 (0.250)	0 .	0 .
Affiliate	0.161 (0.022)	0.150 (0.027)	0.269 (0.089)	0.152 (0.054)	0.133 (0.091)	0.250 (0.250)	0 .	0.167 (0.167)
Part-time student	0.004 (0.004)	0.006 (0.006)	0 .	0 .	0 .	0 .	0 .	0 .
Started in spring	0.014 (0.007)	0.017 (0.010)	0.038 (0.038)	0 .	0 .	0 .	0 .	0 .
n	280	180	26	46	15	4	3	6

TRANSFER STUDENTS	Race/Ethnicity							
	All	White	Black	Asian	Hispanic	Other URM	Internat.	Unknown
Transfer GPA	3.053 (0.025)	3.068 (0.031)	2.980 (0.063)	3.134 (0.095)	3.005 (0.079)	3.217 (0.170)	3.046 (0.189)	2.898 (0.105)
Transfer Credits	55.008 (1.039)	54.941 (1.268)	51.958 (2.780)	51.229 (3.699)	54.519 (4.106)	53.250 (6.223)	56.600 (8.311)	71.619 (5.716)
Male	0.288 (0.022)	0.315 (0.028)	0.305 (0.060)	0.200 (0.069)	0.370 (0.095)	0.083 (0.083)	0.100 (0.100)	0.143 (0.078)
From other state	0.062 (0.012)	0.055 (0.014)	0.085 (0.037)	0.057 (0.040)	0.037 (0.037)	0 .	0.400 (0.163)	0 .
Attended private school	0.114 (0.015)	0.121 (0.020)	0.136 (0.045)	0.029 (0.029)	0.074 (0.051)	0.250 (0.131)	0.100 (0.100)	0.095 (0.066)
Sherman	0.027 (0.008)	0.026 (0.010)	0.034 (0.024)	0 .	0.037 (0.037)	0.000 .	0.100 (0.100)	0.048 (0.048)
Affiliate	0.053 (0.011)	0.044 (0.012)	0.068 (0.033)	0.057 (0.040)	0.148 (0.070)	0.083 (0.083)	0 .	0 .
Part-time student	0.140 (0.017)	0.106 (0.019)	0.186 (0.051)	0.200 (0.069)	0.222 (0.082)	0.167 (0.112)	0.500 (0.167)	0.048 (0.048)
Started in spring	0.300 (0.022)	0.286 (0.027)	0.186 (0.051)	0.457 (0.085)	0.296 (0.090)	0.583 (0.149)	0.500 (0.167)	0.286 (0.101)
n	437	273	59	35	27	12	10	21

MAT Program	Race/Ethnicity							
	All Grad	White	Black	Asian	Hispanic	Other URM	Internat.	Unknown
Male	0.287 (0.023)	0.294 (0.030)	0.176 (0.066)	0.240 (0.087)	0.353 (0.119)	0.333 (0.167)	0 .	0.365 (0.067)
Sherman	0.080 (0.014)	0.078 (0.018)	0.176 (0.066)	0.160 (0.075)	0 .	0.111 (0.111)	0 .	0.019 (0.019)
Part-time student	0.426 (0.026)	0.429 (0.033)	0.441 (0.086)	0.480 (0.102)	0.235 (0.106)	0.444 (0.176)	0.286 (0.184)	0.442 (0.070)
N	376	231	34	25	17	9	7	52

Standard errors in parentheses

Note: Welch's t-test was used to compare the sample mean for each group of non-white students with that of white students, which were treated as the control group. Bold print indicates instances in which differences in the means were statistically significant at the p<.05 level.

Analysis proceeded using the following basic model.

$$y_i = \beta_0 + \beta_1 X_i + \beta_2 \text{Race}_i + \beta_3 \text{Male}_i + \beta_4 \text{Support}_i + \beta_5 \text{Academic}_i + \beta_6 X_i + \mu_i$$

In this model, outcome y is either the completion of the appropriate internship course, official completion of the program or, completion of a bachelor's or master's degree. The model also includes a series of indicator variables for race / ethnicity and gender. For undergraduates, it also includes a variable reflecting status at the time of matriculation as an "affiliate" of one of the university's non-merit-based support programs for undergraduates, particularly "living learning communities" that bring students together in a residence hall based on a shared interest or the Shriver Center focused on service learning. An indicator for Sherman participation was included in the model for both undergraduate and MAT students.

The model controlled for academic preparation when looking at the subsamples of undergraduates who entered either as freshmen or transferred from a two- or four-year college or university. In the case of freshmen, the academic control variables included SAT scores (combined score on the math and verbal portions of the exam) and high school GPA. For transfer students, the academic control variables that were consistently available included GPA from the transfer institution and number of college credits awarded at the time of matriculation at UMBC.

Finally, the model included a number of control variables. For undergraduates, these variables were "private"—an indicator of whether or not the last school a student attended was public or private—and "springstart" indicating

students who started in the spring term rather than the fall. (Almost all of the students in this latter group were transfer students, and 29.4% of the transfer students in the sample started in this manner.) For graduate students, the main additional control variable included in the analysis reflected a student's status as full or part-time.

The main analytical approach involved using OLS regression to produce estimates for each outcome for the two main groups (undergraduate and graduate students) and the two subgroups of undergraduates.

Additional analysis involved the creation of an indicator variable to focus specifically on the experiences of students of color. This variable, designated "URM," for "underrepresented minority," includes students who indicated they are American Indian / Alaska Native, Black, Hispanic/Latinx, Native Hawaiian / Other Pacific Islander, or multiracial. Combining the data in this way provided an opportunity to explore whether there are any differences with respect to the various outcomes when focusing specifically on URM men, URM women, non-URM men and non-URM women. To explore interaction effects with the various control variables, the model was also estimated separately for just White students and URM students.

Qualitative

Qualitative analysis focused on addressing the following three research questions.

- ii. How do teachers of color who earned their teaching certification at a public research university describe the experiences that they believe contributed to their persistence in the program?

- iii. How do teachers of color who earned their teaching certification at a public research university describe the challenges, if any, that they encountered while enrolled in the program?
- iv. How do students of color who started, but did not complete, the teacher education program at a public research university describe their experiences in the program and their decision not to continue?

The repetition of a wide range of words and topics became clear during the initial review of the transcripts. These were organized into a coding system involving eight primary codes. As Richards and Morse (2013) suggest, descriptive codes of this sort provide important context and structure for the data. Further analysis informed the creation of 35 sub-codes identifying particular experiences and perspectives for each major topic (see Table 3.6).

Codes were developed, organized and applied using Dedoose software as each transcript was reviewed a second time. Richards and Morse (2013) note that the goal during this stage is to identify emergent themes by seeking connections and relationships within and between codes and sub-codes, making comparisons, and drawing out generalizations. While Dedoose offers a number of tools to track and visualize patterns resulting from code applications, much of the analysis in this case proceeded through careful review of excerpted passages, and regrouping/categorizing coded passages under the emergent themes.

Preliminary analysis indicated that the experiences of alumni who completed certification, the focus of research questions *ii* and *iii*, overlap in many and interesting ways with those of the alumni who did not complete certification and are the focus of question *iv*. Thus the study proceeded with analysis across participants for each of the major themes, with differences and similarities between the two groups noted in each

case. The results from this iterative process, including quotes and passages that best reflect major themes for each research question, are reported in the following chapter.

Table 3.6: Codes and sub-codes used in qualitative analysis

Decision	K-12 Background
<i>Adult</i>	<i>Lack of Resources</i>
<i>Childhood</i>	<i>Suburbs</i>
<i>College</i>	<i>Teachers</i>
<i>Family Connections</i>	<i>Very Diverse</i>
Motivation	Program - Positive Experiences
<i>Lifestyle</i>	<i>Community</i>
<i>Prestige/Respect</i>	<i>Curriculum</i>
<i>Public Service</i>	<i>Faculty</i>
<i>Salary Considerations</i>	<i>Field Experiences</i>
<i>Type of Work</i>	<i>Sherman Program</i>
Program - Challenges	Recruiting Students of Color
<i>Classes</i>	Suggestions for Students of Color
<i>Expense</i>	Suggestions for Teacher Education Program
<i>Focused on Different Setting</i>	<i>Alumni Engagement</i>
<i>Internship</i>	<i>Offer Education Major</i>
<i>Bad/Challenging Placement</i>	<i>Increase Diversity</i>
<i>Cultural Differences</i>	<i>Professional Preparation</i>
<i>Not Prepared</i>	<i>Marketing</i>
<i>Unpaid</i>	
<i>Lack of diversity</i>	
<i>Major TMI</i>	
<i>Poor Advising / Course Scheduling</i>	
<i>Prefer Hands-On</i>	

Chapter 4: Results

While the quantitative and qualitative portions of this study proceeded concurrently, the results are presented sequentially. The four research questions guiding this study are listed below. The quantitative results primarily address the first question, while the qualitative findings address the latter three.

- i. What factors are associated with students of color at a public research university completing or leaving a teacher education program?
- ii. How do teachers of color who earned their teaching certification at a public research university describe the experiences that they believe contributed to their persistence in the program?
- iii. How do teachers of color who earned their teaching certification at a public research university describe the challenges, if any, that they encountered while enrolled in the program?
- iv. How do students of color who started, but did not complete, the teacher education program at a public research university describe their experiences in the program and their decision not to continue?

4.1 Quantitative Results

4.1.1 Completing the Program

Table 4.1 describes characteristics of the 103 students in the undergraduate sample who started at UMBC as freshmen and completed the education program. Comparison of sample means across racial and ethnic sub-groups using Welch's t-test reveals several statistically significant differences at the $p < 0.05$ level. Black, Asian and Hispanic students who completed the education program had lower scores on the SAT exam than did White students (1128.0, 1145.6, 1086.0, and 1214.6, respectively), and Asian students also had lower high school GPAs. Among all students completing the program, the majority (67.0%) went through the secondary

Table 4.1: Characteristics of program completers who started as freshmen

FRESHMEN	Race/Ethnicity						
	All	White	Black	Asian	Hispanic	Internat.	Unknown
SAT Score	1191.6 (12.380)	1214.6 (16.127)	1128.0 (9.165)	1145.6 (20.145)	1086.0 (36.824)	1260.0 (10.000)	1163.3 (56.960)
High School GPA	3.801 (0.044)	3.875 (0.053)	3.714 (0.183)	3.583 (0.100)	3.716 (0.169)	3.955 (0.125)	3.26 (0.133)
Male	0.262 (0.044)	0.338 (0.057)	0 .	0.125 (0.085)	0 .	0.5 (0.500)	0 .
From another state	0.097 (0.029)	0.085 (0.033)	0 .	0.063 (0.063)	0.2 (0.200)	1 .	0 .
Attended private school	0.107 (0.031)	0.113 (0.038)	0.2 (0.200)	0 .	0.2 (0.200)	0 .	0.333 (0.333)
Sherman	0.155 (0.036)	0.183 (0.046)	0.2 (0.200)	0.125 (0.085)	0 .	0 .	0 .
Affiliate	0.136 (0.034)	0.113 (0.038)	0.4 (0.245)	0.25 (0.112)	0 .	0 .	0 .
Part-time student	0 .	0 .	0 .	0 .	0 .	0 .	0 .
Started in spring	0.010 (0.010)	0.014 (0.014)	0 .	0 .	0 .	0 .	0 .
CAHSS	0.728 (0.044)	0.704 (0.055)	0.6 (0.245)	0.75 (0.112)	0.8 (0.200)	1 .	1 .
CNMS + COEIT	0.204 (0.040)	0.254 (0.052)	0.2 (0.200)	0.125 (0.085)	0 .	0 .	0 .
Interdisciplinary/other	0.068 (0.025)	0.042 (0.024)	0.2 (0.200)	0.125 (0.085)	0.2 (0.200)	0 .	0 .
Elementary Education	0.233 (0.042)	0.169 (0.045)	0 .	0.625 (0.125)	0 .	0 .	0.667 (0.333)
Early Childhood	0.097 (0.029)	0.070 (0.031)	0.4 (0.245)	0.063 (0.063)	0.4 (0.245)	0 .	0 .
Secondary Education	0.670 (0.047)	0.761 (0.051)	0.6 (0.245)	0.313 (0.120)	0.6 (0.245)	1 .	0.333 (0.333)
n	103	71	5	16	5	2	3

Standard errors in parentheses

Notes: Welch's t-test was used to compare the sample mean for each group of non-white students with that of white students, which were treated as the control group. **Bold** print indicates instances in which differences in the means were statistically significant at the $p < .05$ level. The category "Other URM" had only a single entry and was omitted from the table.

education track rather than the elementary (23.3%) or early childhood (9.7%) tracks.

Looking at sub-groups, only the Asian program completers differed significantly from this pattern, with the highest percentage going through the elementary track (62.5%), followed by secondary (31.3%) and early childhood (6.3%). Most of the students (72.8%) completed majors in the College of Arts, Humanities, and Social Sciences (CAHSS), with many of the others (20.4%) completing majors in the College of Natural and Mathematical Sciences (CNMS) or the College of

Engineering and Information Technology (COEIT); the remainder (6.8%) completed interdisciplinary or other majors. No significant differences in major selection were apparent between the different racial and ethnic groups.

Comparing these program completers with the characteristics of freshmen who started the program, as reported in Table 3.5, yields a few insights. The Black students who completed the program had a slightly higher mean SAT score than the larger group of those who started it, while the opposite is true of Asian and Hispanic students. It turns out the only statistically significant difference is among White students. While the SAT scores of White completers and the full sample are almost identical, the mean GPA of the completers is 3.88, compared to a mean of 3.73 for the full sample; this difference is significant at the $p < 0.05$ level.

Table 4.2 reports the characteristics of the 111 transfer students who completed the education program. No statistically significant differences are apparent between racial and ethnic groups. In general, these students tended to complete majors in the arts, humanities and social sciences (CAHSS) at a higher rate (84.7%) than did students who started the program as freshmen (72.8%). Comparing these completers with the full sample of transfers students who started the education program, the main difference that is apparent is that completers generally started with more academic credits than did the larger group; the difference is statistically significant ($p < 0.05$) for the whole group (mean of 61.3 credits compared to 55.0 for all transfer students in the sample) and White students (61.6 credits for completers compared to 54.9 credits for those who started.)

Table 4.2: Characteristics of program completers who started as transfer students

TRANSFER STUDENTS	All	Race/Ethnicity			
		White	Black	Asian	Unknown
Transfer GPA	3.152 (0.051)	3.140 (0.060)	2.92 (0.237)	3.345 (0.162)	3.126 (0.145)
Transfer Credits	61.347 (1.895)	61.645 (2.227)	64.333 (8.705)	53.9 (7.868)	67 (3.771)
Male	0.252 (0.041)	0.265 (0.049)	0.5 (0.224)	0.1 (0.100)	0.222 (0.147)
From other state	0.054 (0.022)	0.048 (0.024)	0 .	0.2 (0.133)	0 .
Attended private school	0.090 (0.027)	0.120 (0.036)	0 .	0 .	0 .
Sherman	0.081 (0.026)	0.060 (0.026)	0.333 (0.211)	0 .	0.111 (0.111)
Affiliate	0.027 (0.015)	0.024 (0.017)	0 .	0 .	0 .
Part-time student	0.126 (0.032)	0.120 (0.036)	0.167 (0.167)	0.3 (0.153)	0 .
Started in spring	0.378 (0.046)	0.337 (0.052)	0.333 (0.211)	0.7 (0.153)	0.333 (0.167)
CAHSS	0.847 (0.034)	0.855 (0.039)	0.833 (0.167)	0.8 (0.133)	0.889 (0.111)
CNMS + COEIT	0.144 (0.033)	0.133 (0.037)	0.167 (0.167)	0.2 (0.133)	0.111 (0.111)
Interdisciplinary/other	0.009 (0.009)	0.012 (0.012)	0 .	0 .	0 .
Elementary Education	0.351 (0.046)	0.337 (0.052)	0.167 (0.167)	0.4 (0.163)	0.556 (0.176)
Early Childhood	0.162 (0.035)	0.145 (0.039)	0.333 (0.211)	0.2 (0.133)	0.222 (0.147)
Secondary Education	0.486 (0.048)	0.518 (0.055)	0.5 (0.224)	0.4 (0.163)	0.222 (0.147)
n	111	83	6	10	9

Standard errors in parentheses

Notes: Welch's t-test was used to compare the sample mean for each group of non-white students with that of white students, which were treated as the control group. Bold print indicates instances in which differences in the means were statistically significant at the $p < .05$ level. The categories "Hispanic," "Other URM," and "International" each had only a single entry and were omitted from the table.

Table 4.3 provides the characteristics of MAT students who completed the program. Given the relative paucity of descriptive data for these students, it is perhaps unsurprising that almost no significant differences are apparent. The one exception is

that the percentage of Hispanic completers who enrolled in the program as part-time students (10.0%) is lower than that of White students (40.0%), a difference that may in part reflect the small number of Hispanic students in the sample.

Table 4.3: Characteristics of MAT program completers

MAT PROGRAM	Race/Ethnicity							
	All	White	Black	Asian	Hispanic	Other URM	Internat.	Unknown
Male	0.278 (0.028)	0.262 (0.034)	0.211 (0.096)	0.25 (0.112)	0.5 (0.167)	0.5 (0.224)	0 .	0.310 (0.072)
Sherman	0.103 (0.019)	0.101 (0.023)	0.263 (0.104)	0.188 (0.101)	0 .	0.167 (0.167)	0 .	0.024 (0.024)
Part-time student	0.395 (0.030)	0.399 (0.038)	0.368 (0.114)	0.438 (0.128)	0.1 (0.100)	0.333 (0.211)	0.5 (0.500)	0.452 (0.078)
n	263	168	19	16	10	6	2	42

Standard errors in parentheses

Note: Welch's t-test was used to compare the sample mean for each group of non-white students with that of white students, which were treated as the control group. **Bold** print indicates instances in which differences in the means were statistically significant at the $p < .05$ level.

Finally, Table 4.4 provides information about the majors of freshmen and transfer degree completers in the undergraduate sample, including the number of students for each major who also completed the education program. Psychology, English, and History are the most common majors among both freshmen and transfer students. In fact, looking just at those who received degrees, these subjects account for 42.6% of majors completed by freshman and 48.5% of those completed by transfer students. They account for an even greater share of majors completed by those who also completed the education program; 47.6% of freshmen and 57.7% of transfer students who completed the education program majored in these subjects. Apart from the popularity of these three majors, various differences are apparent in the patterns of major and education program completion by freshmen and transfer students. Most notably, mathematics has similar popularity among both freshmen and transfer students (with 20 majors completed in each case), and yet 65% of freshmen

Table 4.4: Major subjects of undergraduate degree completers, by matriculation type and program completion status

	Freshmen				Transfers			
	<i>Did not complete</i>	<i>Completed</i>	<i>Total</i>	<i>Pct. completed</i>	<i>Did not complete</i>	<i>Completed</i>	<i>Total</i>	<i>Pct. completed</i>
Acting	1	0	1	0.0%	0	0	0	.
Africana Std	0	0	0	.	3	0	3	0.0%
American Std	3	3	6	50.0%	12	9	21	42.9%
Ancient Std	0	1	1	100.0%	0	0	0	.
Asian Std	1	0	1	0.0%	1	0	1	0.0%
Biochemistry	2	0	2	0.0%	1	0	1	0.0%
Biology	8	4	12	33.3%	8	4	12	33.3%
Chemistry	2	0	2	0.0%	0	3	3	100.0%
Chemistry Educ.	1	5	6	83.3%	0	0	0	.
Cultural Anth.	0	0	0	.	2	0	2	0.0%
Computer Eng.	1	0	1	0.0%	0	0	0	.
Dance	6	3	9	33.3%	5	5	10	50.0%
Design	2	0	2	0.0%	0	0	0	.
Economics	2	0	2	0.0%	0	0	0	.
English	10	15	25	60.0%	25	19	44	43.2%
Environmental Sci.	2	2	4	50.0%	1	1	2	50.0%
Environmental Std.	2	0	2	0.0%	2	2	4	50.0%
Gender & Women's Std	1	0	1	0.0%	0	0	0	.
Geography	0	0	0	.	3	0	3	0.0%
Global Studies	3	0	3	0.0%	1	0	1	0.0%
History	13	13	26	50.0%	22	19	41	46.3%
Health Admin. & Pol	2	0	2	0.0%	1	1	2	50.0%
Individual Study	4	2	6	33.3%	6	1	7	14.3%
Information Systems	1	0	1	0.0%	2	0	2	0.0%
Mathematics	7	13	20	65.0%	13	7	20	35.0%
Mechanical Eng.	0	0	0	.	2	0	2	0.0%
Media & Comm. Std	2	1	3	33.3%	1	0	1	0.0%
Mgmt Aging Srv	0	0	0	.	2	0	2	0.0%
Modern Languages	8	3	11	27.3%	19	1	20	5.0%
Music	8	8	16	50.0%	8	3	11	27.3%
Music Education	1	3	4	75.0%	0	2	2	100.0%
Music Performance	0	1	1	100.0%	0	0	0	.
Philosophy	0	0	0	.	1	0	1	0.0%
Physics	0	0	0	.	2	0	2	0.0%
Physics Educ	0	1	1	100.0%	0	2	2	100.0%
Political Science	3	1	4	25.0%	3	0	3	0.0%
Psychology	26	21	47	44.7%	39	26	65	40.0%
Social Work	0	0	0	.	3	0	3	0.0%
Sociology	3	0	3	0.0%	5	4	9	44.4%
Theatre	1	0	1	0.0%	1	2	3	66.7%
Visual Arts	1	3	4	75.0%	4	0	4	0.0%
[No Degree]	50	0	50	0.0%	128	0	128	0.0%
Total	177	103	280	36.8%	326	111	437	25.4%

who completed mathematics degrees also completed the education program, compared to 35% of transfer students with the same major. Freshmen in the sample are also more likely than transfer student to complete majors in music, music education and music performance (9.1% of completed majors, compared to 4.2% of

majors completed by transfer students), while American Studies is more popular among transfer students (6.8% of completed majors, compared to 2.6% of majors completed by freshmen).

4.1.2 Basic Regression Results

Table 4.5 presents the results of the basic regression analysis using the full sample of undergraduate and MAT students. Notably, the table provides estimates for each of three different outcomes: (1) passing the final internship; (2) official completion of the education program; and (3) completion of a bachelor's degree, for undergraduates, or of a master's degree for MAT students. Since different academic control variables are available for freshmen and transfer students, and such variables are lacking for MAT students, no academic control variables were included in this instance.

For undergraduates, the “big picture” view from Table 4.5 is that Black, Hispanic and other URM students are less likely to complete the education program or its final internship, and yet there is no statistically significant difference in the likelihood of their completing bachelor's degrees. The coefficients estimated for Black students are highly significant ($p < .01$) for the first two outcomes, and the same is true for Hispanic students with respect to completion of the program; the estimates for Hispanic students completing the internship and for other URM students for internship and education program completion are all moderately significant ($p < 0.05$). Being a man is associated with a reduced likelihood of passing the internship and completing the degree (both $p < 0.05$) and also of completing the education program ($p < 0.1$). Students who start in the spring semester appear to have a reduced chance of

completing a degree ($p < 0.01$) but not of completing the internship or the education program. Finally, participation in the Sherman program is strongly associated with completion of the internship and education program ($p < 0.01$ and coefficient estimates of 0.402 and 0.412) and also, to a lesser degree, completion of the degree ($p < 0.01$, $\beta = 0.245$).

Table 4.5: Regression estimates for undergraduates and MAT program students

VARIABLES	Undergraduates			MAT Program		
	Internship (1)	Program (2)	BA/BS (3)	Internship (4)	Program (5)	MAT (6)
Black	-0.149*** (0.0543)	-0.204*** (0.0525)	-0.00367 (0.0504)	-0.0534 (0.0784)	-0.194** (0.0830)	-0.0801 (0.0731)
Asian	-0.0311 (0.0556)	-0.0252 (0.0537)	0.0281 (0.0516)	-0.0571 (0.0895)	-0.102 (0.0948)	-0.112 (0.0835)
Hispanic	-0.180** (0.0740)	-0.198*** (0.0715)	0.0242 (0.0686)	-0.178* (0.107)	-0.131 (0.113)	-0.105 (0.0999)
Other URM	-0.275** (0.117)	-0.234** (0.113)	-0.0405 (0.109)	0.0120 (0.144)	-0.0609 (0.152)	-0.0389 (0.134)
International	-0.165 (0.130)	-0.122 (0.126)	-0.0111 (0.121)	-0.210 (0.163)	-0.454*** (0.173)	-0.410*** (0.153)
Unknown race/ethnicity	0.0953 (0.0911)	0.0890 (0.0880)	0.00792 (0.0845)	0.0814 (0.0652)	0.102 (0.0691)	0.0512 (0.0609)
Male	-0.0841** (0.0375)	-0.0659* (0.0362)	-0.0877** (0.0348)	-0.0591 (0.0492)	-0.0692 (0.0521)	-0.0918** (0.0459)
Started in spring	0.0732 (0.0451)	0.0395 (0.0435)	-0.125*** (0.0418)			
Private	-0.0682 (0.0508)	-0.0657 (0.0491)	0.0128 (0.0471)			
Sherman	0.402*** (0.0778)	0.412*** (0.0752)	0.245*** (0.0722)	0.202** (0.0830)	0.220** (0.0879)	0.206*** (0.0775)
Affiliate	-0.0518 (0.0590)	-0.0656 (0.0570)	-0.0745 (0.0547)			
Part-time	-0.0459 (0.0632)	-0.0703 (0.0610)	-0.158*** (0.0586)	-0.116** (0.0454)	-0.0834* (0.0481)	-0.0895** (0.0424)
Constant	0.378*** (0.0280)	0.354*** (0.0271)	0.805*** (0.0260)	0.815*** (0.0391)	0.763*** (0.0414)	0.864*** (0.0365)
Observations	717	717	717	376	376	376
R-squared	0.074	0.085	0.054	0.056	0.068	0.067

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The picture is somewhat less clear for MAT students. Black students have a reduced likelihood of completing the education program ($p < 0.05$), though not of completing the internship or earning a degree. Estimates for international students are large and highly significant, though the small number (7) of these students in the sample and the unique challenges confronting these students may warrant caution in interpreting these results. Participation in the Sherman program is, again, significant ($p < 0.05$ for internship and program completion; $p < 0.01$ for degree completion), and being a part-time student is negatively associated with all three outcomes ($p < 0.05$ for internship and degree completion; $p < 0.1$ for program completion).

Breaking the undergraduate sample into sub-samples of freshmen and transfer students, as reported in Table 4.6, provides an opportunity to control for differences in academic preparation. Here, for freshman, most estimates for the variables indicating race/ethnicity lack significance, with the exception of a weakly significant ($p < 0.1$) estimate reflecting the reduced likelihood of Black students completing the education program. Sherman participation is strongly associated with internship and education program completion ($p < 0.01$), though the estimate for degree completion is not significant. Of the two academic control variables, high school GPA appears to have the stronger relationship with the three outcomes, ranging from weakly significant for completion of the internship ($p < 0.1$) to moderate for program completion ($p < 0.5$) and strong for degree completion ($p < 0.01$). Unexpectedly, the coefficient estimates for SAT score are negative, though only significant for degree completion ($p < 0.01$).

Table 4.6: Regression estimates for freshmen and transfer students

VARIABLES	Freshmen			Transfer Students		
	Internship (1)	Program (2)	BA/BS (3)	Internship (4)	Program (5)	MAT (6)
Black	-0.166 (0.105)	-0.200* (0.102)	-0.0259 (0.0804)	-0.110* (0.0628)	-0.173*** (0.0598)	0.0272 (0.0647)
Asian	-0.0553 (0.0820)	-0.0497 (0.0799)	-0.00715 (0.0627)	-0.0358 (0.0789)	-0.0176 (0.0752)	0.0709 (0.0813)
Hispanic	-0.134 (0.133)	-0.102 (0.129)	-0.0179 (0.101)	-0.194** (0.0882)	-0.245*** (0.0841)	0.0455 (0.0909)
Other URM	-0.254 (0.246)	-0.235 (0.239)	-0.113 (0.188)	-0.286** (0.129)	-0.241* (0.123)	-0.00801 (0.133)
International	0.263 (0.283)	0.295 (0.275)	0.152 (0.216)	-0.307** (0.142)	-0.253* (0.135)	-0.0563 (0.146)
Unknown race/ethnicity	0.113 (0.203)	0.146 (0.198)	0.192 (0.155)	0.0840 (0.0999)	0.0673 (0.0952)	-0.0318 (0.103)
Male	-0.0419 (0.0667)	-0.0578 (0.0649)	-0.0628 (0.0510)	-0.0825* (0.0467)	-0.0343 (0.0445)	-0.0465 (0.0481)
Started in spring	-0.0536 (0.283)	-0.0320 (0.276)	-0.186 (0.217)	0.133*** (0.0465)	0.0883** (0.0444)	-0.105** (0.0480)
Private	-0.0662 (0.0817)	-0.110 (0.0795)	0.0435 (0.0625)	-0.0720 (0.0658)	-0.0294 (0.0627)	-0.0210 (0.0677)
Sherman	0.294*** (0.104)	0.275*** (0.101)	0.126 (0.0793)	0.395*** (0.130)	0.447*** (0.124)	0.303** (0.134)
Affiliate	-0.00191 (0.0813)	-0.0401 (0.0792)	-0.0269 (0.0622)	-0.185* (0.0948)	-0.140 (0.0904)	-0.192* (0.0977)
Part-time	-0.282 (0.577)	-0.223 (0.562)	0.378 (0.441)	-0.0247 (0.0623)	-0.0511 (0.0594)	-0.176*** (0.0642)
SAT score	-0.000276 (0.000249)	-0.000252 (0.000242)	-0.000523*** (0.000190)			
High school GPA	0.134* (0.0735)	0.169** (0.0716)	0.234*** (0.0562)			
Transfer GPA				0.0942** (0.0419)	0.0971** (0.0399)	0.133*** (0.0431)
Transfer credits				0.00265*** (0.000994)	0.00289*** (0.000947)	0.00167 (0.00102)
Constant	0.259 (0.323)	0.0935 (0.314)	0.589** (0.247)	-0.108 (0.150)	-0.163 (0.143)	0.274* (0.154)
Observations	280	280	280	437	437	437
R-squared	0.076	0.098	0.119	0.126	0.137	0.077

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The model involving transfer students highlights a number of variables negatively associated with completion of the internship and the education program but that do not have a statistically significant relationship with degree completion. Black students, for instance, have a reduced likelihood of passing the internship

($p < 0.1$) and the education program ($p < 0.01$). The picture is similar for Hispanic students ($p < 0.05$ and $p < 0.01$, respectively), other URM students ($p < 0.05$ and $p < 0.1$) and international students ($p < 0.05$ and $p < 0.1$). Being a man is negatively associated with completing the internship ($p < 0.1$). Starting in the spring, interestingly, is positively associated with passing the internship ($p < 0.01$) and completion of the education program ($p < 0.05$), but negatively associated with degree completion ($p < 0.05$). Sherman participation, again, has a strong positive relationship with completion of the internship and education program, and to a lesser extent with degree completion (with $p < 0.1$ in the first two cases and $p < 0.05$, in the third; coefficient estimates range from 0.303 for degree completion up to 0.395 and 0.447 for completion of the internship and education program, respectively). Affiliated status generates two weakly significant coefficient estimates, though these are unlikely to provide much insight given that relatively few transfer students have affiliated status. Finally, part-time students are less likely to complete the degree program ($p < 0.01$).

In general, the coefficient estimates for the transfer students' academic control variables are highly significant and positively associated with the three outcomes. Estimates for transfer GPA, for instance, are significant at the 0.05-level for completion of the internship and the education program, and at the 0.01-level for degree completion. The estimates associated with transfer credits are highly significant for completion of the internship and the education program ($p < 0.01$); notably, the number of transfer credits is not associated with an increased chance of

degree completion, hinting at the pressures confronting these students as they think about the extra coursework and time required to complete the education program.

4.1.3 A Closer Look at Race/Ethnicity and Gender

Table 4.7 presents estimates from a series of models involving students grouped by URM status (this includes students reported as Black, Hispanic, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, or multiracial) and gender. Results for the full sample of undergraduates (columns 1 and 2) and MAT students (columns 3 and 4) lack academic control variables and provide the chance to compare estimates in each case as they relate to completion of the education program and degree completion. Looking at undergraduates, being a White man is associated with a reduced likelihood of degree completion ($p < 0.01$) over White women, the control group, but no significant difference is apparent with respect to completion of the education program. Estimates for URM men and women are both highly significant ($p < 0.01$) when looking at completion of the education program, with larger coefficients calculated for men ($\beta = -0.293$) than for women ($\beta = -0.191$); estimates for degree completion were not significant.

For MAT students, White men have a reduced likelihood ($p < 0.05$) of completing both the education program and the degree. While URM women show a significantly reduced likelihood of completing the education program ($p < 0.01$), the results are less clear cut when it comes to degree completion ($p < 0.1$).

Table 4.7: Program and degree-completion estimates for students grouped by URM and gender status

VARIABLES	All Undergraduates		MAT Program		Freshmen	Transfer
	Program (1)	BA/BS (2)	Program (3)	MAT (4)	Program (5)	Program (6)
White + Female	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
White + Male	-0.0556 (0.0405)	-0.102*** (0.0389)	-0.129** (0.0555)	-0.119** (0.0493)	-0.00322 (0.0702)	-0.0599 (0.0503)
URM + Female	-0.191*** (0.0512)	-0.0231 (0.0491)	-0.264*** (0.0742)	-0.129* (0.0658)	-0.0658 (0.0971)	-0.235*** (0.0583)
URM + Male	-0.293*** (0.0712)	-0.0504 (0.0683)	0.0270 (0.120)	-0.0617 (0.106)	-0.389*** (0.130)	-0.182** (0.0831)
Asian	-0.0240 (0.0537)	0.0264 (0.0516)	-0.106 (0.0937)	-0.114 (0.0832)	-0.0443 (0.0793)	-0.0197 (0.0751)
International	-0.120 (0.126)	-0.0138 (0.121)	-0.471*** (0.171)	-0.417*** (0.152)	0.291 (0.273)	-0.258* (0.135)
Unknown race/ethnicity	0.0914 (0.0880)	0.00477 (0.0845)	0.107 (0.0683)	0.0535 (0.0606)	0.166 (0.196)	0.0635 (0.0951)
Started in spring	0.0373 (0.0433)	-0.125*** (0.0415)			-0.0785 (0.273)	0.0872** (0.0439)
Private	-0.0675 (0.0491)	0.0145 (0.0471)			-0.108 (0.0787)	-0.0217 (0.0628)
Sherman	0.412*** (0.0751)	0.244*** (0.0721)	0.226*** (0.0863)	0.213*** (0.0766)	0.279*** (0.100)	0.450*** (0.123)
Affiliate	-0.0663 (0.0570)	-0.0731 (0.0547)			-0.0480 (0.0784)	-0.144 (0.0900)
Part-time	-0.0698 (0.0609)	-0.158*** (0.0585)	-0.0832* (0.0474)	-0.0878** (0.0420)	-0.196 (0.556)	-0.0514 (0.0593)
SAT score					-0.000301 (0.000239)	
High School GPA					0.168** (0.0710)	
Transfer GPA						0.0985** (0.0398)
Transfer credits						0.00286*** (0.000945)
Constant	0.351*** (0.0276)	0.809*** (0.0265)	0.780*** (0.0413)	0.871*** (0.0366)	0.136 (0.310)	-0.159 (0.142)
Observations	717	717	376	376	280	437
R-squared	0.086	0.055	0.088	0.072	0.110	0.138

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Columns (5) and (6), which focus on completion of the education program for freshmen and transfer students, reintroduce academic control variables to the mix and provide an extra level of specificity regarding challenges facing different groups. For freshman, estimates for URM men are both highly significant ($p<0.01$) and sizable ($\beta = -0.389$). Focusing on transfer students, estimates for URM women are also highly

significant ($p < 0.01$), though somewhat smaller ($\beta = -0.235$); estimates for URM men are moderately significant ($p < 0.05$) and, again, somewhat smaller ($\beta = -0.182$).

4.1.4 Interaction Effects

Two final tables present results in a sequence of regression models looking separately at URM students and White students to explore interaction effects in each case with the various covariates. Table 4.8 again looks at the full sample of undergraduate and MAT students. For URM students, participation in the Sherman program is weakly significant among undergraduates ($p < 0.1$); the estimate for MAT students is not statistically significant. For White undergraduates, the estimates associated with Sherman participation are at once highly significant ($p < 0.01$) and very large in magnitude ($\beta = 0.492$). The estimate for affiliated status, by contrast, is weakly significant and reflects a decreased likelihood of program completion. Among White MAT students, only the estimate for Sherman participation turns out to be significant, albeit weakly ($p < 0.1$); given the relatively high rate at which MAT students complete the education program, it is not surprising that the magnitude of this estimate is also substantially smaller ($\beta = 0.214$) than it is for White undergraduates.

Table 4.9 presents results from a series of eight models divided evenly between freshmen and transfer students and including, in each case, the appropriate control variables reflecting academic preparation. Columns (1) and (2), with completion of the education program and degree completion as outcome variables,

Table 4.8: Program completion estimates for URM and White students

	Undergraduates		MAT Program	
	URM (1)	White (2)	URM (3)	White (4)
Male	-0.0996 (0.0619)	-0.0578 (0.0462)	0.282* (0.143)	-0.124* (0.0639)
Started in spring	-0.00808 (0.0756)	0.0317 (0.0579)		
Private	-0.0521 (0.0805)	-0.0416 (0.0632)		
Sherman	0.218* (0.118)	0.492*** (0.100)	0.298 (0.195)	0.214* (0.109)
Affiliate	0.00308 (0.0843)	-0.147* (0.0785)		
Part-time	-0.103 (0.0865)	-0.0317 (0.0891)	-0.171 (0.129)	-0.0878 (0.0593)
Constant	0.173*** (0.0429)	0.349*** (0.0312)	0.544*** (0.0957)	0.785*** (0.0457)
Observations	143	453	60	231
R-squared	0.054	0.059	0.142	0.043

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

respectively, focus on URM students who started as freshmen. Of note is the sizable ($\beta = -0.384$) and moderately significant ($p < 0.05$) estimate when looking at the coefficient associated with men completing of the education program; repeating a familiar pattern, the estimate for men with respect to degree completion is not significant. The coefficient estimate for high school GPA is weakly significant for degree completion, but not for completion of the education program. Finally, participation in the Sherman program does not result in statistically significant estimates for URM freshman for either outcome.

Table 4.9: Program completion estimates for URM and White freshmen and transfer students

VARIABLES	All Freshmen				All Transfer Students			
	URM		White		URM		White	
	Program (1)	BA/BS (2)	Program (3)	BA/BS (4)	Program (5)	BA/BS (6)	Program (7)	BA/BS (8)
Male	-0.384** (0.144)	-0.146 (0.129)	0.0321 (0.0776)	-0.0372 (0.0620)	0.0282 (0.0604)	0.0711 (0.109)	-0.0639 (0.0591)	-0.0960* (0.0575)
Started in Spring	-0.422 (0.434)	0.0663 (0.389)	0.0729 (0.331)	-0.334 (0.265)	0.0313 (0.0631)	-0.124 (0.114)	0.0742 (0.0608)	-0.141** (0.0592)
Private	-0.0815 (0.178)	0.0953 (0.160)	-0.104 (0.0949)	0.0771 (0.0758)	-0.0682 (0.0821)	-0.0444 (0.148)	0.0343 (0.0839)	-0.0212 (0.0816)
Sherman	-0.112 (0.191)	0.0212 (0.171)	0.416*** (0.125)	0.179* (0.0997)	0.620*** (0.159)	0.340 (0.288)	0.334* (0.176)	0.285* (0.171)
Affiliate	-0.0501 (0.167)	0.0237 (0.150)	-0.130 (0.100)	-0.0967 (0.0802)	0.0296 (0.0928)	-0.162 (0.168)	-0.203 (0.135)	-0.144 (0.131)
Part-time			-0.341 (0.590)	0.566 (0.471)	-0.134* (0.0726)	-0.0237 (0.131)	-0.00222 (0.0894)	-0.219** (0.0870)
SAT score	-0.000453 (0.000679)	0.000269 (0.000608)	-0.000324 (0.000285)	-0.000593** (0.000228)				
High school GPA	0.00428 (0.167)	0.281* (0.149)	0.266*** (0.0863)	0.222*** (0.0690)				
Transfer GPA					0.0170 (0.0583)	0.0427 (0.105)	0.101* (0.0539)	0.163*** (0.0524)
Transfer credits					0.00173 (0.00135)	-0.00108 (0.00244)	0.00442*** (0.00133)	0.00261** (0.00129)
Constant	0.916 (0.840)	-0.489 (0.752)	-0.217 (0.359)	0.712** (0.287)	-0.0643 (0.200)	0.659* (0.362)	-0.252 (0.193)	0.159 (0.188)
Observations	45	45	180	180	98	98	273	273
R-squared	0.203	0.192	0.146	0.129	0.193	0.052	0.085	0.116

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The picture is quite different looking at White students who started as freshmen. In this case participation in the Sherman program results in highly significant ($p<0.01$) and sizable ($\beta=0.416$) estimates regarding the effect on completion of the education program; the estimate for degree completion is weakly significant ($p<0.1$) and more modest in scale ($\beta=0.179$). For these students, unlike the URM students, the estimates for high school GPA ($p<0.01$) are strongly significant for both outcomes.

URM transfer students, unlike freshmen, appear to see considerable benefit from participating in the Sherman program in terms of completing the education program; the estimated coefficient is both highly significant ($p<0.01$) and large in magnitude ($\beta=0.620$). There is also some evidence these students are less likely to

complete the education program ($p < 0.1$) if they attend part-time, though this status does not appear to be related to degree completion.

Columns (7) and (8) report estimates for White students who started at the university as transfers. Being a man is associated with a reduced chance of degree completion ($p < 0.1$), though not of completing the education program. Estimates for starting in the spring, similarly, are moderately significant ($p < 0.05$) and point to a reduced likelihood of degree completion. Looking at Sherman participation, the estimates for these students are weakly significant ($p < 0.1$) for both outcomes, contrasting with the results for White freshmen. Finally, the academic control variables show signs of greater relevance for these students, with the estimates for transfer credits appearing to be strongly significant ($p < 0.01$) for completion of the education program and moderately significant ($p < 0.05$) for degree completion. Reversing that pattern, the estimates for transfer GPA are strongly significant for degree completion ($p < 0.01$) and weakly significant ($p < 0.01$) for completion of the education program.

4.1.5 Quantitative Highlights

These quantitative results have several implications for increasing the number of students of color completing the teacher education program. The first is that the higher rate at which students of color leave the education program does not appear to be primarily the result of differences in their academic preparation or performance. This finding suggests that other factors contribute to the decisions of many students of color to stop pursuing teaching certification. The results also point to the need for specificity in order to understand these factors. Asians, for instance, are

underrepresented in the education program and the teaching profession, and yet Asian students who begin the education program appear to complete at rates similar to those of White students. Black, Hispanic, and other URM students, by contrast, are less likely to complete the education program, and the data show this difference is particularly pronounced for students from these groups who also enter the university as transfer students. These findings suggest a one-size-fits-all approach to increase the diversity of students completing the education program is not sufficient, and highlight the need to target recruitment and retention initiatives to maximize their effectiveness. Finally, the success of the Sherman STEM Teacher Scholars Program in increasing the likelihood of education program completion for students, including URM students, points to the potential impact of a broader initiative (involving non-STEM majors) modeled on this approach, which includes financial support, academic coaching, advising, and community building.

4.2 Qualitative Results

The 12 alumni who participated in this study offered a range of perspectives regarding experiences they believed were helpful to them in completing the education program, and also those that stood out as obstacles. The following section outlines key themes that emerged from analysis of their remarks. The discussion begins with an exploration of the experiences underlying the participants' interests in teaching, and it continues with analysis of their accounts of experiences in the program, first looking at those contributing to persistence and then focusing on those regarded as challenges. After a brief look at the distinctive experiences of those who did not complete the program, the discussion concludes with presentation of the participants'

key insights and recommendations as they relate to the retention of students of color in a teacher education program.

The following discussion is arranged thematically, and as such the experiences and insights offered by alumni who completed the program are mixed together with those of alumni who did not. To highlight similarities and differences between these two groups, the names of students who did not complete the program appear with the letters “NC”.

4.2.1 Deciding to Teach

At the heart of study participants’ decisions whether or not to persevere in the teacher preparation program were their stories about deciding to become teachers. Wrapped up with these stories were their own experiences in school and the attitudes about teaching that they were exposed to at home and in their communities. These experiences, in turn, shaped their perceptions of the teaching profession and motivation to pursue certification and enter the profession.

Choosing a Teaching Career

Eight of the twelve participants—including the four who did not complete the program—talked about how they were drawn to a teaching career as children or adolescents. Lily(NC), Marie and Lara talked about playing games as young children in which they assumed the role of teacher. “Since I was a little, tiny girl, playing school with my siblings and cousins—there was so many of us—I always had to be a

teacher,” Marie explained. “I always gave them real math problems, and I graded them and corrected them. It was destined.”

The idea of a teaching career took longer to develop for others. Eimash said she decided to become a math teacher when she was a senior in high school—she was good at math and also had found she “really enjoyed” tutoring. Marcus(NC) recalled being 15 or 16 when he was sitting in math class one day and decided on a teaching career: “I was like, ‘Why don’t I just teach and then I could just do this?’ That might seem kind of nonchalant and casual, but everyone has to make a decision on what they’re going to do eventually.” Jake said he decided in high school to work toward becoming a teacher after realizing it “meshed” together his interests in mathematics, working with other people, and having the opportunity to explain or even argue certain concepts.

The three participants who decided while they were in college to pursue teaching careers offered varied reasons. For Kierra, this amounted to a shift from her earlier plan to become a biology professor. She quickly realized she preferred chemistry over biology, and she also recognized gaps in her own K-12 preparation. The idea of becoming a teacher took hold as she started taking education courses. “There [were] a lot of people excelling above me, and I felt like I was capable as well but didn’t have the resources,” she said. “So I got into education for... a chance to provide that resource for a student [who] grew up in a similar situation as I did.”

As a student athlete at UMBC, Tanya enjoyed opportunities to work with children and adolescents at sports camps and other volunteer opportunities. Her career plan had been to go into sports broadcasting until she found herself with an extra year

of scholarship funding to begin a graduate program. With no master's program in communications available, she decided instead to try the MAT program in early childhood education. She quickly realized she enjoyed working with children and helping them, and she came to appreciate the opportunity she would have as a teacher to work with students in under-resourced settings. The fact she did not think of a teaching career earlier, she explained, was simply the result of her experience: "All I had known was sports, so my career path coming out of college was initially to go into sports."

For Katie, a biology major, the idea of teaching really started to take shape when she was a junior in college and was thinking about what to do after graduating. A friend told her about the Sherman program, and she was intrigued as she learned about the program and found out she could get scholarship support while taking education classes and deciding if she wanted to pursue teaching as a career. She enjoyed her classes, and then she became convinced she was on the "right path" when she was placed in a school for her internship and found herself enjoying the experience.

Unlike the other participants in this study, Rudolph decided to become a teacher only after he had worked for several years in an office job. He was thinking during that time about career options, and the work brought him in regular contact with teachers. "What really stuck with me is a lot of them would say the same thing over and over again.... 'We don't have a lot of male teachers. We don't have a lot of people of color.'" As a result of these conversations, he started volunteering as a tutor in a local school, and then he started thinking about going back for his teaching

certification. Like Katie, he found he particularly enjoyed the experience when he was able to work with students. “It was something that just kind of fit for me,” he said.

Five of the participants talked about the different ways their own K-12 experiences shaped their interest in teaching. Toni excelled in her classes until seventh grade, she said, and then was shaken when she started failing in math and science; she recalled how her government teacher became her source of support and helped her regain her confidence. Jake said he had a number of good teachers at different stages of his schooling and still keeps in touch with them. Some of these teachers are now his colleagues: “...It’s pretty cool to come full circle back around to teach with the people who taught me and work with the greats, you know?”

Asia(NC)’s school experiences were largely positive, particularly through the eighth grade. She lived in a small town and had many teachers who taught her siblings and even her aunts and uncles. “They knew me really well,” she said, noting the presence of many teachers of color. “I had access to Black teachers who loved and challenged me, and affirmed me in a lot of ways.” She also learned about inequality in schools when, as a middle school student, she was mistakenly placed for a couple weeks in a class that wasn’t challenging or engaging—the students, she said, just did worksheets each day. A teacher she knew intervened and got her moved to a different class, but she came to appreciate from the experience the reality of inequality in schools and that children from some families had different opportunities.

Three participants talked about their family connections to teaching, and two of these described the distinctive experiences they had growing up in other countries.

Lara, for example, recalled how she would sometimes join her mother, a second and third-grade teacher, at school when she was a child growing up in an African country. She contrasted attitudes toward teachers there with what she has experienced in the United States. “When I was growing up, to be a teacher is like you are a doctor,” she said. “You do not disrespect your teacher.”

Katie offered a similar perspective based on her experiences growing up in an Asian country, where teachers are “well respected” and it is considered honorable to choose teaching as a career. She said she believes those attitudes made it easier to gain support from her family when she decided in college to pursue her interest in a teaching career. At the same time, she talked about her awareness as an Asian woman that many people sharing her background face pressure from their families to pursue careers in areas such as medicine and law and similar fields regarded as indicators of success.

Others described similar pressures. “Teaching is just really risky” said Asia(NC). “I’m a Black student who’s first generation college whose family sacrificed a lot for me to go to college [and have] expectations of success for me.” Those notions of success, she continued, generally involve becoming a doctor or scientist, not becoming a teacher, which is seldom presented as a money-maker. Lara echoed that point. Teachers are not widely respected in this country, she said, and what is more they are not thought to be well compensated, painting a bleak picture for someone who has had financial challenges. “If... you're coming from a world where you're already struggling,” she said, “and you're trying to find a career to help you overcome that, well, teaching might not be where that benefit is, financially.”

Behind the Decision

While other participants stopped short of describing the decision to teach as risky, there was near unanimity in describing the decision as one that was undertaken with low expectations regarding compensation. Kierra, for instance, said she knew it would be a “humble” salary, and Jake said his decision was “clearly not about the money.” Rudolph, changing from another career, said he recognized he “wasn’t going to be as compensated” and accepted the tradeoff: “From my perspective, that’s just work in general.”

Some couched their thoughts about teacher compensation in terms of other perceived benefits. Eimash(NC), for instance, said she was well aware of the perception that teachers are not well-compensated, but was not discouraged. “For me, it’s more about the impact you have as a teacher,” she said. Lily(NC) expressed a similar commitment to teaching. After hearing from others that teaching is “too hard and you won’t get paid enough,” she decided “the money doesn’t matter because I care too much to do something that’s too easy and doesn’t fulfill what I believe I should be doing.”

Factors other than compensation emerged as having greater significance in motivating the alumni to become teachers. Lara, alone, cited the prestige of the profession as playing a major role. While acknowledging that the profession is viewed differently in the United States, she said her own view was shaped by her upbringing in an African country. Teaching is regarded there as an honorable profession, she said, and teachers are respected members of their communities. She

was proud of her mother for being a teacher, she said, “and I wanted to be a teacher just like her.”

The opportunity to balance work and family life was a major draw for Toni, who became a teacher after pursuing a career in another field. “I had children, and I realized I didn’t want to give myself to a career and not have time for my own children,” she explained.

Three participants based their decisions, at least in part, on the recognition that they enjoyed the work that teachers do. Katie, for instance, said she appreciates the “intellectual aspect” of the job and being able to teach her students material she is passionate about. Rudolph said that he discovered in working with students that it was something that “just kind of fit.” Marcus(NC), a career changer like Rudolph, saw teaching as an appealing alternative to a desk job, and one that would allow him to engage with other people, move and be active, and make use of his fondness for math. “I just wanted a class full of kids, and a desk full of papers I gotta grade..., and kids making loud noise in the hall,” he said. “Just regular teacher stuff, that’s all I wanted.”

While Marcus(NC) downplayed the idea of “saving” his students or impacting their lives, the other participants all talked to varying degrees about being motivated by a desire to “make a difference” in the lives of students. These desires ranged from being personal and immediate to focusing on societal change and broad issues of fairness. Marie, for instance, said she enjoys helping students learn, and finds it particularly satisfying when she is able to reach a student who might have been struggling. Lara said she loves to take care of people, and she strives to provide a safe

place for her students and make change simply by making each day better for them. Tanya is guided by the belief that children deserve to have teachers they look forward to seeing, and she describes a feeling of “pure joy” when she is able to help a student who might have felt helpless. At the same time, she is troubled by an education system that offers different opportunities to different students, and she feels that “immersing” herself in that system is a way to help change it. Kierra also said she wants to help change the system for the better.

Eimash(NC) and Asia(NC) both said they see teaching as a way of serving the community. Asia(NC) regards it as “noble” work, while Eimash(NC) is excited about the possibility of helping students recognize that math is a “really cool thing.” At the same time, she sees it as a way of serving the community. Jake said his own career decision was guided by a desire to do something “worthwhile with his life,” and he sees teaching as a way of having a positive effect and serve some purpose. Toni, reflecting on the teacher who helped her through a tough time, tries to “make a change in the world” by being a champion for her own students.

Lily(NC) also reflected on her own experience in describing her motivation to become a teacher. She recalled how people who had her grandmother as their third-grade teacher would visit years later and talk about how she made a difference in their lives. “I guess there isn’t much prestige in teaching, except for the appreciation factor afterwards,” she said. “People, once they’ve left your class, then they realize, ‘Oh, wow, you actually helped me.’”

4.2.2 Program—Positive Experiences

As might be expected, comments regarding the experiences believed to have contributed to persistence came almost exclusively from those who completed the program. The major exception to this centers on the experiences of the nine students in the sample who participated in the Sherman STEM Teacher Scholars Program; eight of these nine students—including three who did not complete the education program—had positive things to say about their experiences as Sherman scholars. Apart from these Sherman experiences, detailed later in this section, the study participants described positive experiences falling into two broad areas: faculty and a sense of community, and the curriculum / availability of field experiences.

Faculty and Community

Five alumni spoke in highly positive terms about their interactions with education department faculty, commenting on their energy, commitment, and support. Marie, for instance, recalled a faculty member forming a study group to work with students as they prepared to take the Praxis exam just as the newly adopted Common Core standards came to be reflected on the test. Toni remembered a group of faculty singing to her and other graduating students at an annual event held to recognize those who are completing the program. “That love from them is amazing,” she said. “They really want you to be a teacher.”

At one point, Toni said, as she started in the education program, she took a course that involved writing differentiated lesson plans. She only realized after the semester started that she was in the wrong course. “I had never even written a lesson plan yet, much less... a differentiated one, and I remember being in the class going,

‘Oh.... I think I’m in the wrong class. This is going to cost so much money for me to switch.” The professor encouraged her and worked with her, and she also found the other students in the class to be supportive, including one who was already teaching and for whom the preparation of lesson plans was “old hat.”

Tanya commented on the impact that several faculty members had on her own development and career. “The way they presented education and the way they talked about kids and the lights they shined on different subjects within education,” she said, “it sparked something in me that made me want to do more.” She also commented that professors have remained supportive since she graduated, in one case going to her school to assist with community outreach. This approach and the opportunity to access resources from the department, she said, help create a “family dynamic.”

Lara said she is often surprised when she comes back to campus and one of her professors from the education program will recognize her despite the fact she graduated several years ago. “It’s because they are a community, and I love that feeling,” she said, explaining that is the reason she is an “active recruiter” for UMBC.

The Curriculum and Field Experiences

Two alumni had particularly positive things to say about the curriculum. Marie said the “entire game plan was mapped out” and that the department has a “template for every student.” While other participants raised concerns about advising and communication from the department, Marie regarded this as one of the department’s strengths: “They make sure that you have signed up for the classes. They check in with you.”

The focus of the program, in Tanya's recollection, was less on curriculum details than the subtleties of relationship building and engagement. Tanya noted that the county where she teaches is now focusing its strategic plan on relationship building, causing her to reflect on her experiences in the program. "It's like they were almost sort of ahead of the game when they were preparing us," she said. "They knew what was coming down the road."

Two of the three men who participated in the study commented on the effectiveness of the field experiences they had as part of the program and the importance of these experiences in preparing them to teach. Rudolph said he has spoken to other teachers whose final internships were much more abbreviated than the experience required in the UMBC program of spending an academic year as a student teacher. The depth of that experience, he said, allowed him to "see what it's really like to be a teacher.... That was really helpful, because I don't think I went into this with rose-colored glasses, thinking this is just going to be like one of those movies.... I went in just knowing what to expect."

Jake talked about his final internship as well as other times he was able to gain hands-on experience, including a course in which he and other participants taught lessons to groups of high school students. Even with the final internship, he observed, student teachers still have fewer responsibilities than they do when they get in front of a class by themselves. The cumulative effect of all the field experiences he was able to have, Jake said, was that he had dealt with many of the challenges he faced as a new teacher and was able to "take everything in stride."

Sherman Program

The dominant theme emerging from comments of eight of the nine alumni who were Sherman Scholars is that the program had an impact on them by giving them access to supportive and knowledgeable staff members. Kierra put it in direct terms: “If it wasn’t for the Sherman Scholars, I wouldn’t have completed [the program].” She commented on the availability of staff members to provide support or simply to talk if she walked into their offices. She remains in touch with Sherman staff and said she also benefits from the alumni community that they help maintain.

Lara, a straight-A student in the past, described her feeling of discouragement when she found herself struggling in college and realized she would have to work much harder. A Sherman staff member gave her support and advised her on how to get the help she needed. Lara also talked about the benefits associated with the financial support she received as a Sherman Scholar. Not least among them was its role in convincing her parents of the soundness of her decision to pursue a teaching career.

Lily(NC) commented broadly on the benefit of being part of a community of students sharing a desire to become teachers. “That was very helpful because, in my experience, a lot of people [who] wanted to be teachers [did so] after they had done other things or if their first plans did not pan out how they wanted them to.” Other benefits of the program, in Lily(NC)’s view, included regular workshops and events focused on various issues or teaching styles. She particularly appreciated the program’s focus on bringing in people who offered advice about teaching students from low-income backgrounds.

The program's regular activities and meetings included times for reflection, Katie said, which were often occasions to think deeply about a topic. "I thought just the part... where we're constantly being pushed to improve and reflect on our skills was really helpful." She also appreciated the program's requirement that she spend time in classrooms and "shadow" teachers even before beginning to take education courses because it gave her a "realistic view" of teaching.

The emphasis on field experiences in the program sat well with Jake: "They made sure I knew what I was getting into at the start, and no matter how hard it was, they prepared me for it." Being with other students sharing the same experiences magnified the benefit, providing a "support system" in thinking about how to handle particular situations. The flip side of these experiences, Jake said, is that some students realize that a teaching career is not for them: "It's showing you what teaching is going to be like, the worst of it and the best of it."

4.2.3 Program—Challenges

The participants in this study described a range of challenges they encountered while they attended UMBC and worked toward the goal of becoming teachers. For those who completed the program, these challenges ranged in severity from mere annoyances to significant obstacles; for those who left, the challenges in some cases were of a nature that they prevented progress or led to changes of plan. The following discussion categorizes these challenges into three broad areas: financial concerns, program-related obstacles, and issues relating to culture and

diversity. The distinctive perspective of those who didn't complete the program will be detailed in each case.

An additional layer in this discussion relates to the often intense experiences associated with completion of the final internship. Seven of the nine participants in the study who persisted through the program reported challenges at this stage. While these internship challenges divide along similar lines as the broader concerns, they will in some cases receive extra attention.

Finances

Marie talked about the need to work while going through the program. That became more of a challenge at times when the program became particularly demanding, including when she took an accelerated course during the summer. The professor, she said, was unwilling to give her or the other students flexibility to complete assignments while balancing work responsibilities.

Lara was one of many students who encountered challenges in connection with the final internship. For her, the challenge came toward the end when she realized that, in order to secure a job, she would need to pay for and then pass the Praxis exam. "I had no money; I was literally broke," she said. She credits her participation in the Sherman Program with allowing her to continue without delay; a staff member came up with the resources for her to take the exam.

A different kind of challenge related to finances confronted Kierra as she reached the internship stage. She had hoped to gain experience teaching in an urban setting with a class likely to be composed largely of students of color. However,

lacking a car, the only setting available to her for her final internship was a middle school located near the UMBC campus. “That school is predominantly White, and that’s not the environment that I thrive in,” she explained.

For Asia(NC), the financial challenge emerged as she completed her undergraduate degree in political science. Though she’d been interested in becoming a teacher as a child, her career goal had shifted to education policy because she thought it would be the best way to address the issues she cared about. Then a policy internship convinced her “it wasn’t what I wanted to do with my life as a career.” Already a senior, she quickly dismissed the idea of staying on for the MAT program. “I couldn’t have afforded to pay for grad school,” she said. “I kind of needed to work immediately.” She was accepted to an alternative certification program that put her to work in a classroom while she started taking the education courses required for certification through another institution.

Program Elements

Eight alumni—including three non-completers—described a range of challenges relating to courses they took, the quality of advising and support they received, and other aspects of the education program. At the “mild annoyance” end of the spectrum, Jake talked about his general dissatisfaction with many courses that he felt were easy—“I think getting a B is fairly difficult”—and overly focused on theory as opposed to the practical matters he found to be more useful. Kierra, focused on becoming a secondary teacher, was disappointed at one point when she took a course on inclusion that was taught from an elementary school perspective; the issues in

those settings are distinct, she contends, and it should be taught as a separate course. More generally, she expressed concern that videos and other course materials at times pre-supposed that the aspiring teachers would end up in settings in which they could develop lesson plans assuming that students would have access to laptop computers. She teaches in an urban setting at an under-resourced school where such amenities, taken for granted in some places, are unavailable.

Eimash(NC) was disappointed by a course on diversity and inclusion; echoing Jake's broad concerns, she found it to be too focused on following a text rather than on discussion. Moreover, she wanted opportunities to apply what she was learning. Rudolph, an MAT student, shared a similar perspective on the need for applied learning, and yet he reflected on the limitations of what can be taught in comparison with what he needed to know in his internship and as a teacher.

So I had all the theory, the background, and I knew a little bit about what to expect going into teaching. But there are just some things that you can't be taught here, you know? That's not anything... on the professors. It's just, they can tell you, but until you experience it, you just don't know. You just don't.

While the internship was a challenge, Rudolph felt he benefited from its demands.

Three alumni, including one non-completer, expressed concerns that relate to the lack of an education major at UMBC. Jake, aspiring to be a high school math teacher, felt discouraged as he took challenging upper-level courses that were required for his major but seemed to have little application to what he would be teaching. And he noted the irony of completing a major that opens up other career options associated with higher pay: "I think part of that [speaks] to why we have so few math teachers, at least in our district. Because if you have a math degree, you can do many more things besides teaching." Katie, a biology major, expressed a similar

view, though both she and Jake conveyed their personal satisfaction at having studied their respective disciplines more deeply than an education major would have allowed.

For Lily(NC), an aspiring middle school math teacher, the struggles in math classes started soon after she arrived on campus with the goal of completing a math degree and the MAT program in five years. She was assigned to an advisor who steered her toward courses she later realized were more appropriate for someone planning to do research in math. “It’s not anyone’s fault,” she said, “but I know that I didn’t receive the advice that I was needing from the beginning.” It wasn’t until her third year at UMBC that she was assigned to a different advisor and was told she did not need to major in math to teach the subject in middle school. She chose psychology instead, and struggled to complete the requirements simply to graduate in five years.

While she took an education course, Lily(NC) felt little connection with the department. “It was like the education department was sort of just there,” she said. “I think with them not having a major, it just... was like, ‘Well, we’re going to give you courses, and that’s about it.’” She did not have an advisor from the department, and she said other students interested in teaching told her that faculty from the department were overwhelmed to the point that it “almost felt like a public defender’s office.”

Others had trouble figuring out how to balance the requirements for a STEM major with those of the education program. Kierra said the demands from long days filled with chemistry labs and then education coursework left her feeling “fatigued out of my mind.” Eimash(NC) started at UMBC with a particular interest in completing a bachelor’s of science in mathematics, but she could not see a way to

complete her teaching certification in that time. Her best option for certification at UMBC would have been to take a fifth year to complete the MAT program, but then she had the option with her degree complete of going through an alternative certification program instead of paying for another year at the university.

Diversity and Culture

Four participants described experiences in the program that touched on issues related to diversity and cultural sensitivity. For Lara, an episode during her internship left her feeling that she had been treated unfairly. She explained that she had been sick and had missed a couple days of school. Despite having a doctor's note and believing the absences were excused, she said, she was asked to stay extra days at the end of her internship to make up for those she missed. She said her understanding was that the decision for her to stay longer came from the department, and it struck her as unfair that she was apparently being treated differently than other interns. "I was the only Black intern at that school," she said. "Did that play a role? I don't know.... But it made me wonder why, when I know all the things that have happened with the other interns, and they were not told to stay longer."

Lara's experience raised questions and left her feeling "bitter." Marcus(NC), on the other hand, described an episode that made him feel marginalized in the program. He and other participants in the Sherman program were "implored," he said, to read *The Guide for White Women Who Teach Black Boys*. For Marcus(NC), the book's focus pointed to the gap between his perspective and that of other aspiring teachers. "Everyone makes this huge deal about teaching Black kids," he said. "I'm

like, I don't even really know what that means." Being around large groups of Black people, he continued, is simply a part of his experience. "When I go to my grandmother's house for Thanksgiving and there's 40 Black people, I don't go, 'Oh, my goodness. I need to take a course to prepare myself to have Thanksgiving with these Black people.' I just go to Grandma's house."

Tanya and Kierra both made general comments about the program's lack of diversity, particularly when it comes to faculty. Kierra said the program was "White dominated" and that she often felt "lonely." (She noted, however, that the Sherman program had more diversity.) Most of her professors also were White, she said, and she missed having information and insights "more relevant for someone who is a person of color teaching students of color, as opposed to a [White] teacher teaching students of color. There is a difference there that was a little frustrating for me regardless of how great my professors were."

Tanya made a similar point about faculty diversity by describing the relationship she developed with the one faculty member of color she encountered in the program. "I definitely felt there needed to be more because she gave a perspective that connected with me that none of the other professors could," she said.

Tanya and Kierra also shared a similar perspective regarding what they saw as the program's default option of preparing students to teach in less diverse settings. As described earlier, Kierra completed her internship in a less diverse setting than she would have liked because she lacked transportation. Tanya said she thought the program could have done more to provide students with experiences in schools serving children from low-income backgrounds. She had the impression that her

options for the internship were to go into Baltimore City to work in a diverse setting, or to teach in one of the nearby counties where “everything’s going to be picture perfect.” She explained: “I wanted to teach kids in the city that I felt like needed the help, not realizing that there are schools in Baltimore County that resemble city schools. ... We’re not placed in those schools, so we don’t see that. I feel like that would help to be able to see students that look like me.”

4.2.4 Leaving the Teacher Education Program

The four participants who did not complete the education program described a range of experiences that contributed in some way to their departure. Eimash(NC) and Asia(NC) both departed the university with bachelor’s degrees completed. Rather than taking additional time to complete the courses and other requirements for certification, they took the shorter path offered by an alternative certification program and went straight to work as teachers. Despite this shared trajectory, they each describe distinctive experiences and motivations. Eimash(NC) started college intent on completing the rigorous sequence of courses leading to the bachelor of science degree in mathematics, and could not find a way complete the education certificate as well without taking an extra year. At the same time, she said she’s not convinced she wants to earn a master’s degree in education, and might instead pursue something in a STEM area. The alternative certification program, she explained, has provided an efficient way for her to get into a classroom, and it also serves her well given her preference for applied learning.

For Asia(NC), there was not time to complete the education program when she decided toward the end of her undergraduate experience that a career in education policy was not for her. She explained that being able to get a salary while completing the certification requirements made the alternative certification program particularly attractive. While some new teachers taking that pathway end up struggling or leaving the profession, she said, she believes the experiences she had as a Sherman Scholar working with children in schools helped her adapt more easily.

The decisions made by Eimash(NC) and Asia(NC) to find another route into the teaching profession are rational in many respects. Lily(NC)'s departure, on the other hand, highlights a particular set of interests and needs the program did not recognize or address. Her struggles getting adequate advising are detailed above. Ultimately, she felt "left out" because she was interested in teaching middle school math and believed the program was designed to meet the needs of students aiming to teach at either the elementary or high-school levels.

Marcus(NC)'s experience is distinct from the others in that he got to the final phase of the education program, and he even was awarded an MAT degree. He did not, however, successfully complete the internship course, and is not eligible for certification as a teacher. A math major in college, Marcus(NC) had worked in food service before deciding it was time to act on his goal of becoming a teacher. The goal started to unravel during his internship at an urban high school when the teacher he was working with asked him to develop a lesson plan involving conditional statements. The plan he developed involved a story about "students taking a laptop" and used names of students in the class. Marcus(NC) said he was surprised, at the

time, when the teacher reacted strongly upon being shown the lesson plan, describing it as “terrible” and saying it did not “promote excellence.” Though Marcus(NC) came to agree the lesson plan was a mistake, he said it undermined the teacher’s confidence in him and led to the deterioration of their relationship.

Marcus(NC) was placed with a different teacher in another school. He worked hard and felt himself improving as a teacher, he said, and at the same time felt worn down working with a mentor teacher he described as “cantankerous” and “disrespectful.” The relationship proved too difficult to sustain, and he decided to quit the internship. In making that decision, he gave up, at least temporarily, on the goal of becoming a teacher. Maybe, he said, he will try again at some point, but for now he feels drained by the experience. He suggested aspects of what happened may have been unfair or short sighted, referring to his own experiences at work training new employees. Some, he said, do not listen or take advice, and yet he does not give up on them. “A lot of employees end up being really good employees with time and nurturing,” he said, “but in the beginning, they’re not really that good.... My mentor teachers gave up on me pretty quick.”

4.2.5 Suggestions

The participants offered a range of suggestions regarding strategies and approaches they believe would attract students of color to the teaching profession and help them become successful teachers. While some of these suggestions take aim at broad societal factors underlying the undersupply of teachers of color, others single out particular approaches or strategies for the education program and also for aspiring

teachers of color. This section briefly summarizes those suggestions in the areas of marketing and recruitment; programmatic changes; and advice for students.

Marketing and Recruitment

Marketing: Asia(NC) said there's a need for a "marketing" effort designed to attract young people to teaching careers, perhaps modeled on what has been done in STEM areas. Jake and Tanya talked about the need for teachers and other educators to spend time at career days in K-12 schools alongside the doctors, lawyers and others talking about their own professions. Lara said there is a need to change negative perceptions of teaching in society, but she describes this challenge as a "mountain" that goes well beyond UMBC. Rudolph suggested this might be accomplished in part by letting people know about opportunities available to teachers, including chances to go on study tours in other countries: "There's more to being a teacher than just being in a classroom."

Partnerships/outreach: Several participants talked about building and strengthening relationships with schools and other organizations as a way of identifying and recruiting potential teachers. Establishing a "teaching academy" at diverse high schools might be effective, Asia(NC) suggested. Jake talked about the importance of broad outreach at diverse schools, while Tanya, Kierra and Toni suggested outreach to students at community colleges and HBCUs, as well as partnerships with county workforce programs. Within UMBC, Tanya and Kierra said, the department might focus outreach efforts on those fraternities, sororities and student groups that involve students from diverse backgrounds.

STEM reputation: Asia(NC) and Toni said the education program must find a way to increase visibility at a university that is widely perceived as preparing students in STEM areas rather than in education. Eimash(NC) echoed this point, noting that the challenge exists in spite of the university's president making it clear he "really loves teachers." Following this line of thought, Asia(NC) said there is a need for an initiative similar to the Sherman program that provides funding and support for students interested in teaching in non-STEM areas.

Engage alumni: Several participants talked about the role that alumni could play in recruiting students of color to the education program and preparing them to become teachers. Toni referred to teachers who are out there as a network of "spies," and she recommended closer contact with them. Katie talked about the potential value of tapping alumni and other practicing teachers to speak to current students about "emotional rewards" of teaching. In general, Katie and Rudolph said, students in the education program would benefit from having more chances to hear from alumni of the program and other teachers about their classrooms. Building community among alumni of the education program, Katie said, could also benefit practicing teachers by creating an avenue for sharing advice and providing support.

Programmatic Changes

Offer an education major: Jake, Katie, and Lily(NC) thought a stand-alone major would be attractive to certain students, making it possible complete the program more efficiently and also to potentially avoid the need to take classes that might not be seen as having a benefit as far as their teaching plans. Lily(NC) said she

had first-hand knowledge of “about 10 to 15” students from her high school who were interested in teaching “going to Towson because of the education major.”

Emphasis on diversity: Tanya talked about her feeling of connection with a faculty member of color that she did not have with other faculty in the education department. Kierra made a similar point and said it “would have been nice to have a Black professor.” To make an even greater impact on school diversity, Rudolph said, the program should go beyond simply producing teachers of color to also providing advice and encouragement for them to take on leadership roles in schools.

More applied experiences: Jake, Katie, and Rudolph said the program should look for additional opportunities for applied learning, including hearing from teachers about their experiences in classrooms.

Professional preparation: Rudolph and Kierra suggested that more could be done to prepare teachers to take care of themselves. Rudolph said aspiring teachers would benefit from encouragement to “find something to look forward to” so they can move beyond times when “you’re going to freak out.” Katie said it is important for aspiring teachers be given a clear sense of challenges they might encounter and to be aware that these result in some “getting burned out.” Additional discussion might focus on “tools” to “pull yourself back up” after getting overwhelmed. Kierra said she could see value in having a course focused on such topics as self-care and legal protection, including the importance of understanding what is in an employment contract.

Advice for students

Many of the suggestions for students thinking about becoming teachers came from students who did not complete it. Marcus(NC) suggested that students find the “easiest path” possible to get through the education program. Above all, he emphasized the importance of being “authentic,” explaining that students “know when you're just being fake and when you're not really being you.” Eimash(NC) made a similar point, urging students who are considering becoming teachers to “figure out” who they are as individuals by exploring their personal interests. Asia(NC) said it is important to take advantage of opportunities to work with students as early and as often as possible.

Kierra’s advice is to seek admission into Sherman or a similar program that offers scholarship funding and support. In the case of Sherman, she said, this includes valuable opportunities to “talk about and improve your craft” outside of a classroom. Tanya said more undergraduates should think about completing the MAT program, which involves little extra work beyond what is required in the undergraduate program and yet results in students coming away with a master’s degree.

For Rudolph, the most important thing for aspiring teachers is that they have as many experiences as possible and meet “different people from all backgrounds.” He continued: “Try to learn new things, and talk to people who you might not have thought you would have wanted to... because you’re going to find that, the more you do, the more you realize that different viewpoints matter.”

4.2.6 Qualitative Highlights

Initiatives aimed at producing more teachers of color are likely to be most effective if they are based on insights regarding the experiences that students of color have at different stages of the teacher preparation process. The qualitative results point to several aspects of these experiences within a university-based teacher education program that seem to have particular significance in relation to whether or not students of color continue on the pathway leading to certification. For instance, the URM alumni interviews illustrate that financial concerns are common, and they are apt to amplify other challenges confronted during the program's often consuming final internship. Careful advising and open communication with the department are important given the potential that missteps in course selection will compound the challenges facing students who are contemplating the long path leading toward certification. Several interview participants discussed the importance and lasting impact of such advising, along with timely support and encouragement, provided by the Sherman STEM Teacher Scholars Program. However, given the limited number of students participating in the Sherman Program, broader department efforts are needed. Finally, a focus on diversity—including recruitment of faculty of color and sensitivity in selection and discussion of course materials—will likely pay dividends with students looking to see their own perspectives and experiences reflected in the teacher education curriculum. This focus is important for students of color as well as male students, who may feel isolated or marginalized in a program that, like the teaching profession, is primarily white and female.

4.3 Summary of Key Findings

While the results from the quantitative analysis in this study sketch a broad picture in which race/ethnicity, gender, academic background, and student support all play a role in determining the likelihood of a student completing the education program, the most important findings relate to differences among these groups. For instance, Black, Asian and Hispanic students who enter as freshmen have lower average SAT scores than White students, and yet only the Black students are less likely than White students to complete the education program. Black and Hispanic transfer students are less likely to complete the program, and combining these groups with other non-Asian students of color into a category of underrepresented minorities allows for an interesting comparison with white students. For White students, the number of transfer credits upon entry is strongly related to the likelihood of a student completing the education program, and yet credits are not a significant factor for URM students. Affiliation with the Sherman program appears to have a strong relationship to the likelihood of a transfer URM student completing the program, and yet to have a less decisive influence for URM students who start as freshman or who go through the MAT program. A range of other differences across groups points, above all, to the need for specificity in understanding the experiences of students from different backgrounds and determining the types of support that might be most beneficial.

The results from the qualitative portion of the study provide an extra layer of detail regarding the experiences of students of color in the program, including some who completed the program and others who did not. Almost without exception, these

participants were motivated in their decision to become teachers by a desire to “make a difference” in the lives of children, and most started considering a teaching career as children. While many spoke highly about their interactions with faculty members and the design of the program, others expressed concern about the lack of faculty diversity and, for some undergraduates, the struggle they faced trying to balance the demands of particular majors with the additional requirements of the education program. Financial concerns clearly emerged for some students, with a lack of personal transportation circumscribing internship options for one student, and another, with her bachelor’s degree in hand, deciding to collect a teacher’s salary by going through an alternative certification program rather than spending additional time at the university. The support and experiences offered by the Sherman program were viewed as a great benefit by most who participated in it, and yet the challenges some faced connecting with the department and receiving advice point to difficulties that may be particularly vexing for students not associated with the program.

The full picture emerging from the two portions of the study have a number of implications for future practice, policy, and research. The following chapter will explore these implications while discussing these findings within the context of the existing literature on teacher diversity.

Chapter 5: Discussion

As Putman and colleagues (2016) make clear, the teacher diversity gap is sufficiently large that a broad and coordinated approach will be needed to close it. Increasing the retention of teachers of color (Achinstein et al., 2010; Ingersoll & May, 2011) will certainly be an important part of this effort. Yet it also is clear that teacher education programs have a critical role to play in recognizing and nurturing the interests of potential teachers of color while also preparing them for future success inside classrooms. At a time of declining enrollments across many teacher education programs (Sutcher et al., 2016), strategies to attract students of color to the teaching profession, and then to retain them in education programs and prepare them to succeed, must be informed by insights into the experiences that either propel them forward or divert them to other pathways.

Education researchers have used focus groups and other qualitative approaches to look at the experiences and aspirations of students of color in teacher education programs, particularly at the graduate level (Su, 1997; Guyton et al., 1996, Canty, 2016). While institutional data have been used to look at the scale of underrepresentation within programs and understand differences in outcomes (e.g. Flynn et al., 2015), this study is unique in its use of regression analysis to examine differences for particular groups along various pathways leading to certification. The combination of this analysis with insights from interviews and focus groups involving alumni provides a unique perspective on the obstacles and challenges facing these students as they seek to become certified as teachers.

That such obstacles present themselves even at a university with a recognized commitment to inclusive excellence highlights the need for intentional, multi-dimensional efforts to address challenges of underrepresentation in particular fields such as teacher preparation (Maton et al., 2008; Williams, Berger, and McClendon, 2005). Specifically, the social transformation theory of change proposed by Maton and colleagues (2008) contends that these efforts must develop out of an understanding of the academic performance of different groups. The following discussion draws on the findings from the quantitative and qualitative portions of this study to develop such an understanding in relation to institutional practice, policy formation and future research.

5.1 Patterns of Persistence in a Teacher Education Program

The quantitative results from this study point to clear differences in outcomes for students from different racial and ethnic groups who begin the various pathways leading to teaching certification.¹³ The broad picture is one of underrepresentation in the program relative to the diversity of the overall student population. This key finding is consistent with those presented by Flynn and colleagues (2015) in their report on efforts to increase diversity in the teacher education program at the University of Delaware. Yet while Flynn and colleagues reported programmatic challenges in recruiting and retaining students of color, their broad category of “minority” students obscures differences between racial and ethnic groups.¹⁴ The

¹³ While the full sample includes both undergraduates and students in the MAT program, this section focuses primarily on the undergraduate program.

¹⁴ Interestingly, the researchers were able to look separately at enrollment and completion data for first-generation and low-income students. As noted earlier, such financial details were not available in

present study, however, suggests that meaningful group differences are likely to exist. For instance, Asian students at UMBC are underrepresented in the undergraduate education program (they account for 11.3% of the undergraduates in the study's sample and about 22% of undergraduates), and yet they are the only ones other than White students to see their representation increase as a share of those who complete the program (to 12.1%). Though the undersupply of Asian teachers in the workforce contributes to the overall teacher diversity gap, these data suggest an approach may be needed in this case that emphasizes recruitment over retention.

As with Asian students, the representation of White students in the full sample of undergraduates (63.2%) increases when looking at those who completed the program (71.9%). The increases observed for these two groups stand in contrast to decreases in the other groups. Most notably, the representation of Black and Hispanic students in the undergraduate sample (11.9% and 5.9%, respectively) declines by half when looking at program completers (5.1% and 2.8%, respectively). This trend is reflected in the study's regression results, which offer a range of additional insights regarding the attrition of these students from the education program.

Among these is the insight that the lower rate at which Black, Hispanic and Other URM¹⁵ students complete the undergraduate program does not seem to be primarily a reflection of differences in academic preparation. While Black and Hispanic students who started as freshmen have lower average SAT scores than White students (1,113, 1,102, and 1,214, respectively), Asian students also have a

the present study because of changes in policies regarding the research use of information students provide on financial aid forms.

¹⁵ As discussed earlier, OtherURM is a category that includes students reported as American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, or multiracial.

lower average score (1,166) and yet seem to complete the program at a similar rate as White students. Black and Asian students also have lower average GPAs (3.60 and 3.59, compared to 3.73 for White students) though the difference is only statistically significant for the latter group. Looking at those who transfer to the university, there are no statistically significant differences between students of color and White students in terms of either the number of credits they completed or their transfer GPA.

When variables controlling for academic preparation are not included in the regression model (see Table 4.4), the results point clearly to lower rates of retention in the program for Black, Hispanic and Other URM students. Yet these students do not appear to be less likely to complete degrees. Adding academic control variables and looking at freshmen and transfer students separately refines the picture further (Table 4.5). While there's some indication that Black students who enter as freshmen have a reduced likelihood of completing the program, the picture is more complex when looking at transfer students. This pathway into the education program is the more popular one for all of the racial and ethnic groups except Asians, and students who are Black, Hispanic or Other URM all show a reduced likelihood of completing the internship and the education program. Yet it does not appear these students are less likely to complete degrees, building the case that there is something about their experiences in the education program that contributes to their decisions not to continue.

A final series of regression models comparing groups of URM and white students points toward the same conclusion (Table 4.8). While these results must be

interpreted with some caution given the small numbers, particularly in the case of URM students, it is striking there is no evidence that the academic preparation of freshmen or transfer students is related to the likelihood of URM students completing the education program.¹⁶ The situation is nearly reversed for White students, with the academic control variables—particularly high school GPA for those who started as freshmen, and both credits and GPA for transfers—appearing to have reasonably strong relationships with both program and degree completion.

The data also suggest gender plays a role in the likelihood of a student completing the program, though again there are variations. URM men who enter as freshmen are particularly unlikely to complete the program ($\beta = -0.384$). That does not seem to be the case for URM men who entered as transfer students, who appear to have slightly higher likelihood of completing the program than URM women who transferred to UMBC.

The remaining factor appearing to be most strongly related to completion of the education program is participation in the Sherman program, though again there is a need to look carefully at different groups. Coefficient estimates for participation are consistently positive and sizable in relation to completion of the education program (ranging from $\beta = 0.22$ for MAT participants up to $\beta = 0.41$ for undergraduates.) Controlling for academic preparation for freshmen and transfer students produces similar estimates, though slightly reduced in size for freshmen ($\beta = 0.28$). The models looking at URM and White students offer additional insights. Participation in the Sherman program generally has a stronger positive relationship with completion of

¹⁶ High School GPA only shows up as weakly significant ($p < 0.1$) in an estimate of a positive relationship to degree completion for URM students who entered as freshmen.)

the education program for White students than it does for URM students (see Table 4.7). Indeed, while the coefficient estimate for URM freshmen lacks significance, it is quite large for White freshmen ($\beta=0.42$). The same pattern is true for MAT students, with a weakly significant estimate only for White students ($p<0.1$, $\beta=0.21$). White transfer students who participate in Sherman again see an increased likelihood of completing the education program, and yet, reversing the trend for the other groups, the most substantial benefit seems to go to URM transfer students, with a highly significant and sizable coefficient estimate ($p<0.01$, $\beta=0.62$). While these results must be interpreted with caution given the small number of students in the URM subgroups, they speak to the overall importance of specificity in understanding outcomes for diverse student groups.

5.2 Diversity and Teacher Preparation

These quantitative results raise a range of questions about the experiences of students of color as they take education courses and consider pursuing teaching careers. This section turns to the qualitative results and the relevant research literature in an effort to understand these experiences in relation to students' motivations and interests. These experiences highlight a number of factors that might contribute to the pattern illustrated through the quantitative analysis, and they also suggest various approaches that might be implemented to recruit and retain students of color in a teacher education program.

5.2.1 Timing of Decision

The research literature has relatively little to say about when future teachers of color decide on their career path or how that timing compares with that of White teaching aspirants. The primary exception is a qualitative study by Miller and Endo (2005) in which the researchers examined the experiences of eight students of color in two education programs. In that case, five participants, or 62.5%, reported they made the decision they wanted to become teachers while in college.

That is roughly opposite the picture that emerged in this study, with eight of the 12 participants reporting they had developed their interest in pursuing teaching careers before starting college. (Interestingly, this includes all four of the non-completers.) The difference with the findings from Miller and Endo may result from the relatively small samples in each case, and it may also reflect differences between the studies' participants. Whereas Miller and Endo were focused on current students in teacher education programs, this study involved a more restricted group of participants, almost all of whom had either completed the education program and become teachers or who were taking different paths to complete certification. It is possible, and perhaps likely, that the career plans reported by some students while they are in an education program would turn out to be less than durable.

Insight regarding the timing of students' career decisions could be used to develop targeted recruitment and outreach efforts (Villegas & Davis, 2007). In this case, the results highlight the value of a mixed approach. For a majority of participants, the initial interest in teaching took hold before college. Outreach efforts targeting elementary and secondary audiences might be expected to reach students

sharing a similar receptivity to the rewards of a teaching career. And yet the results also point to the potential benefit of having ongoing conversations in the university setting about the realities and rewards of the teaching profession. Three participants first considered teaching careers while in college, and another recalled her childhood interest in teaching only toward the end of her undergraduate experience. Regular conversations involving alumni and other practicing teachers could serve to build community among those already working toward a teaching career while serving to remind or inspire those with dormant or as-yet unrealized desires to teach.

5.2.2 Motivation

A recurring theme in the research literature is that people of color are often drawn to the teaching profession out of a desire to make a difference in the lives of young people (Lewis, 2006; Brown & Butty, 1999). In their literature review, Achinstein and colleagues (2010) report that such “humanistic commitments” are associated both with people of color selecting the teaching profession and also the likelihood they will remain in it. The results of this study strongly support this finding, with 11 out of 12 participants reporting that their decision to teach emerged in one way or another from a desire to make a difference or do something deemed to be “worthwhile” or “fulfilling.”

In addition to sharing this motivation, the participants almost universally agreed that their decision to teach involved accepting that the salaries available in their chosen career would be modest or even “humble.” This acknowledgement echoes findings reported by Gordon (1994) and Flynn and colleagues (2015) that the perception teachers are not well compensated is among the reasons that more students

of color are not choosing to go into the profession. Yet the present study offers a different perspective in that these concerns are the acknowledged reality of alumni who decided to become teachers. For many, this decision involved the realization that making a difference for young people and other positive aspects of teaching brought personal benefits that outweighed any sacrifice in terms of compensation.

While more research is warranted, it is easy to see how mindfulness of this perceived tradeoff could play into decisions about beginning a teacher education program and seeing it through to completion. Two of the participants talked about the particular challenge of making this decision for students who are the first in their immediate families to attend college or have faced financial struggles in the past. Others described financial challenges they encountered during the program, challenges that in some cases became more acute during the internship phase when students are generally unable to hold outside jobs.

The overall picture emerging from the analysis is of students who are attracted to teaching careers because of the opportunity to make a difference, who are concerned and yet accepting of realities regarding teacher compensation, and who, in some instances, face financial challenges in the program that threaten to throw things out of balance. This points to the kinds of marketing and outreach efforts that might resonate particularly well with students of color as they consider careers in teaching. At the heart of these efforts would be conversations, presentations and materials reinforcing the notion that teachers can and do make a difference in the lives of young people. Additional elements might aim to provide students with accurate financial information and also acquaint them with any resources that might be available to

offset educational costs. (At UMBC this might include scholarships that are available to help students at the critical phase when they are completing the final internship.)

5.2.3 The Experiences of Students of Color in a Teacher Education Program

A number of qualitative and mixed methods studies identify various challenges facing students of color in teacher education programs. Three qualitative studies (Su, 1997; Guyton et al., 1996, Canty, 2016), for instance, focused on the experiences of students of color in master's level teacher preparation programs, finding that the students felt isolated at times and perceived a benefit in being placed for internships and other experiences in school settings that reflected their own backgrounds. Two studies (Irizarry, 2011; Irizarry & Donaldson, 2012), focused specifically on the experiences of aspiring Latinx teachers, report similar findings regarding school placements and also recount a number of experiences that students had in the education program and the broader university setting that made them feel isolated and marginalized.

The findings presented in the present study are largely consistent with these results, with students describing internship placements that did not match their backgrounds or interests in teaching in diverse settings, and reporting feeling isolated at times by a lack of diversity among both students and faculty in the program. One student who did not complete the program reported feeling that his perspective—that

of a Black man preparing to teach White students and students of color—was at times deemphasized relative to that of White women preparing to teach in diverse settings.

While these challenges were among those that explicitly centered on issues of race and ethnicity, many others emerged in which the role of race and ethnicity is less clear. Participants described, for instance, their financial struggles, and their frustrations with courses or the difficulty of establishing a connection with the education department. Similar accounts are reported by Flynn and colleagues (2015), who identified a range of concerns among students of color, first-generation students, and students from low-income backgrounds about the teaching profession, affordability of the university, and the availability of support in the teacher education program.

One distinctive aspect of the present study is that participants, as alumni of the university, were able to place their experiences with the education program in the full context of their experiences at the institution, and also offer insights regarding strategies and approaches to attract and retain students of color. Additionally, nine of the twelve participants were part of the Sherman program, giving them access to financial, academic, and social support. That some of these students nevertheless struggled financially or faced a challenge getting proper advising within the department suggests the possibility that students facing similar challenges without such resources may find them insurmountable.

5.2.4 Supporting Students

The Sherman Program is focused on producing STEM teachers to work in highly diverse settings. While it was not developed specifically to produce teachers of

color, the results in this study clearly suggest that the support it provides benefits a number of students as they work to complete the education program. And the structure of the program, which involves financial support, mentoring and academic support, professional development and extra practical experiences, mirrors that of several programs described in the literature (e.g. Ukpokodu, 2015; Waddell, 2014; Clewell & Villegas, 2001) that report success recruiting students of color and preparing them for teaching careers mentoring and academic support, professional development and extra experiences in partner schools.

Just as the quantitative results of this study point to the benefits of support offered by the Sherman Program, the comments provided in focus groups and interviews clearly illustrate these benefits as experienced by participants. Several described the support they received at critical moments and credited the Sherman Program for their successful completion of their degrees and the education program. As one participant noted, the success of this model for STEM-focused students points to the potential impact that a similar or adapted program might have if focused instead on the challenge of producing teachers of color.

5.3 Policy Significance

The results from this study provide new insights into the challenges facing students from underrepresented groups who are interested in teaching careers. The quantitative analysis suggests there are distinctive aspects of these students' experiences that relate to their retention or attrition from the education program. Notably, the analysis highlights differences according to race/ethnicity and whether a

student started at the university as a freshman or transfer student. These results, based on data for hundreds of students across several years, are of interest on their own, and they also provide a framework within which to understand the results from the qualitative portion of the study. The qualitative results, in turn, provide a level of depth and nuance that would not have been achievable using quantitative data alone. Specifically, the experiences of URM alumni help to explain how and why factors such as race and ethnicity influence student outcomes within the education program. While not generalizable to all URM students, such findings elevate the voices of those at the center of this study. A mixed methods approach was thus particularly suitable in this case, with the results from each approach complementing the other, and the study as a whole pointing to a number of possible responses to the diversity gap in education. The following section discusses these responses in relation to institutional changes that might be implemented.

5.3.1 Institutional Change

This study points to the need for institutional change in order to increase the number of students of color completing the education program. As Maton and colleagues (2008) make clear, institutional change efforts that promote equity are most effective when they begin with self-assessment and an understanding of differences in academic performance for students from different groups. Next, the diversity challenge needs to be articulated, and a response to it prioritized. This process has been successfully implemented to increase URM students' access to and outcomes in STEM majors at the university (Hirshman & Hrabowski, 2011).

While some participants in this study were aware of the university's successful diversity efforts in STEM, their experiences in the education program did not generally reflect these successes. Instead, they encountered an education program in which students of color were underrepresented and in which they were unlikely to encounter faculty members of color. This speaks to the importance of self-examination in understanding challenges of this sort at the department and program levels to identify strengths and areas for improvement (Hirshman & Hrabowski, 2011). This study provides insights into both.

First, the study suggests that an area on which the education program can build is faculty diversity. While the department's faculty is one of the most diverse at the university, it does not reflect the diversity of the student body. Thus, a priority for change should include the recruitment and retention of more faculty members of color. Data from the National Science Foundation (2017) speak to the potential achievability of this goal. Though African Americans only received 6.7% of the doctorates awarded in 2017, they accounted for 14.7% of the doctorates awarded in education and related fields that year. Participants in the study who encountered faculty members of color in the education program described the impact of the connections they were able to develop. One, in particular, lamented that she did not encounter a faculty member of color in the program and so did not have a chance to form such a connection.

Additionally, specialized programs may be needed to address recruitment and retention gaps. The experiences of participants in the Sherman program clearly point to the potential benefit of a cohort-based program focused on the particular challenge of producing teachers of color. While focused scholarship support might provide some of the same benefits, the experiences of Sherman alumni who participated in the study spoke to the wide-ranging impact of having a point of contact available to help navigate the program, adapt to challenges as they arise, and identify resources to overcome various obstacles.

In a more general sense, the study also points to a need to engage young people of color in conversations about the financial and non-monetary rewards associated with teaching careers. Almost all of the alumni who participated in this study were motivated by a desire to make a difference in the lives of young people, and they made the decision to teach mindful of the level of compensation they could expect to receive and aware of negative attitudes about teaching that are widely held in our society. At the institutional level, efforts to recruit students of color to education programs might begin with conversations on campus emphasizing the rewards of the profession and presenting examples of those who have built satisfying lives around this career. A next step might involve outreach to secondary schools and the development of partnerships with them; alumni could be engaged at both stages. A number of alumni who participated in this study expressed their willingness to serve as ambassadors for both the university and the teaching profession.

However, the social transformation theory of change (Maton et al., 2008) underscores the difficulty of implementing and, importantly, institutionalizing such changes. The process requires sustained effort that involves conversations with the campus community and external partners, the engagement of campus leaders through shared governance processes, and the use of data, both to ground the work and to evaluate the effectiveness of any response (Hirshman & Hrabowski, 2011). Ultimately, as Hirshman and Hrabowski note, the success of change initiatives reflects the degree to which they are embraced by the campus community and become integrated within the planning process. In presenting evidence highlighting the challenges and opportunities the campus faces in producing diverse teachers, this study aims to contribute to and perhaps catalyze such an effort.

5.4 Limitations

A number of limitations associated with the design of this study warrant caution when thinking about the generalizability of the findings. Some limitations relate to the setting, and others to the sample and the availability of data.

Setting

UMBC's approach to education certification is unusual among Maryland's public colleges and universities with teacher education programs in that it does not currently offer a major in education.¹⁷ This state of affairs, which results from the

¹⁷ This circumstance is poised to change as UMBC prepares to offer a Bachelor Science degree in Middle Grades STEM Education. The program was approved by the Maryland Higher Education Commission in February. See

state's effort to regulate the establishment of new higher education programs and protect against unnecessary program duplication, may mean that the population of prospective teachers who attend UMBC and take teacher education courses is different in certain ways from the population of prospective teachers who attend a comparable Maryland public university that offers an education major. If, for instance, a meaningful number of students with particularly strong interests in teaching select institutions offering an education major over UMBC, the population in UMBC's education program might tend to be made up of students with less durable interests in education. Alternatively, students who appreciate UMBC's reputation as a STEM-oriented institution and who come to the university with an interest in becoming certified as teachers despite the lack of an education major might be particularly determined to continue in their chosen path. Regardless of the precise nature of any difference resulting from the absence of an education major, the study's findings must be understood within this institutional context, especially when making comparisons with other Maryland public universities offering teacher education programs.

The study's findings may be more generalizable or transferable outside of Maryland's public colleges and universities. That is, the UMBC model and variants can be found at institutions across the country, meaning many lessons from this study may apply more directly. For instance, a teacher certification option for undergraduates who are required to complete a major in another subject can be found

at various liberal arts colleges.¹⁸ Other institutions, including Columbia University's Teachers College, only offer graduate level teacher certification options.¹⁹ Perhaps the greatest concentration of education programs with pathways similar to those found at UMBC are in California, where a state law prevented institutions for several decades from offering a stand-alone education major for undergraduates (Fensterwald, 2017). Fensterwald reported that, in spite of the legal change in 2017, many institutions planned to continue offering the options developed in preceding decades, which included "blended" programs for undergraduates who complete majors in other subjects, along with post-baccalaureate pathways.²⁰ Despite such similarities, however, differences between institutional contexts caution against unqualified generalizations of the study's findings, and highlight the importance of investigating the experiences of students of color in education programs across a range of settings.

Additionally, the lack of an education major at UMBC also created an identification challenge for the quantitative portion of the study: With no education major, the question of who persists in the program and who does not immediately became more difficult to answer. As discussed in Chapter 3, the approach used to address this challenge was to use the selection of certain courses as an indication of interest in the education program. It is possible, of course, that some students who

¹⁸ At Haverford College, for instance, students interested in obtaining certification to teach have the option of completing an education minor, an education concentration in tandem with certain other majors, or a post-baccalaureate program (see <https://www.haverford.edu/education/academic-programs>). Bowdoin College offers education as a minor, a "coordinate" major which must be completed alongside a departmental or student-designed major, and a postgraduate pathway (see <https://www.bowdoin.edu/education/requirements/index.html>).

¹⁹ See <https://www.tc.columbia.edu/academics/programs-search/>.

²⁰ For instance, California State University, Fullerton, offers credential programs for undergraduates and graduates leading to certification in various areas, along with master's and doctoral-level programs in a number of specialties (see <http://ed.fullerton.edu/prospective-students/degrees-credentials/>).

take an introductory education course are simply exploring and have no intention of taking additional courses and pursuing certification. Yet it seems reasonable to suggest that the students who take these courses are equally likely, regardless of race or ethnicity, to be interested in pursuing careers in teaching. The section on future research proposes an approach to investigate whether or not this is truly the case.

Sample Issues

The decision to focus the qualitative portion of the study on the experiences of alumni was based on the expectation that the perspectives offered by these former students would be suitably broad and considered given the passage of time and the opportunity for reflection. The potential to introduce bias through this approach was not recognized until efforts to contact participants were already underway. While participant outreach started with a lengthy list of alumni, including both completers and non-completers from a range of program areas, it quickly became clear that completers were more apt to respond, as were Sherman Scholars, including both completers and non-completers. The original goal of conducting the research solely through three focus groups was dispensed with in favor of an approach that also involved structured interviews.

Ultimately, five alumni who completed the program participated in two focus groups, while the remaining seven alumni, both completers and non-completers, participated through semi-structured phone interviews. The sample provided a rich range of experiences and perspectives, and yet the fact that updated contact information was more available for former Sherman Scholars than non-Sherman

alumni resulted in their being significantly overrepresented in the qualitative sample. While this initially presented as a limitation for the study, it also offered a window into the experiences of students who are among the most likely to succeed. The accounts these alumni offered regarding the wide-ranging challenges they faced and the types of support they drew upon points to the kinds of experiences that may be particularly likely to derail students who lack access to the same network of support.

Data

The original plan for the quantitative portion of this study was to use Pell eligibility information as a proxy for socioeconomic status. Unfortunately, as discussed in the Chapter 3, the university's office of Institutional Research, Analysis, and Decision Support was unable to provide this or other financial aid data, citing current guidance from the U.S. Department of Education. A promising alternative to control for students' family backgrounds was to use the "first generation" indicator derived from the Common Application reflecting whether students would be the first generation in their families to earn a bachelor's degree. However, the fact that the indicator was only added in 2013-14, toward the end of the time period under investigation, limited its usefulness in the present study. While an indicator for private school attendance was included in the analysis and likely controlled for family income to some extent, the unavailability of Pell information and the limitations with the first-generation indicator ultimately reduced the potential to develop insights

regarding the relationship between a student's socioeconomic status and completion of the education program.²¹

Another approach would have involved the use of information on students' home addresses to infer family income based on the characteristics of particular census tracts. Geospatial analyses of this sort are becoming increasingly common in education policy research focused on school choice and other topics (Yoon, Gulson, & Lubienski, 2018). While such analysis is beyond the scope of the present study, the use of geographic information to control for family income has promise for future research on education program completion and may prove useful, particularly in the analysis of a suitably large and varied dataset.

5.5 Future Research

The study's limitations and results point to a number of promising areas for future research. At the institutional level, a logical next step might be to conduct a study involving a series of focus groups with a diverse group of undergraduate students in the education program. Members of a particular cohort could be invited at the time of their first education course, and an initial discussion would aim to elicit information about their goals, motivations, and past experiences. Subsequent meetings might be held once each semester and aim to explore the students' experiences in their education courses and any changes in their goals or the ways they think about a career in teaching. While participants in the present study were able to

²¹ It is worth noting that Pell eligibility data, though commonly used in higher education studies, may be misleading in some cases. For instance, Rosinger and Ford (2019) contend that it is a "rough" measure of low-income status and should be used with some caution.

identify a range of experiences contributing to their persistence or departure from the program, an advantage of the proposed approach would be the opportunity to explore the ways that participants' perspectives change over time and to learn about significant experiences as they occur. One topic that would be interesting to explore in this manner concerns student's perceptions about teacher salaries and any financial challenges encountered in the program. Such an approach also has the potential to reveal whether there are decision points when certain forms of support—academic social, or financial—could be particularly effective for retaining students of color in the program.

An alternative, or perhaps complementary approach might involve the use of a survey at the beginning and end of the first course in the education sequence. In addition to asking for demographic and background information, the survey might include a number of open-ended questions focusing on their interests and motivations, along with a series of prompts asking the students to rate their current interest in a teaching career, their satisfaction with the program, and related topics. The use of an incentive strategy to encourage students to complete both surveys could be particularly helpful in increasing response rates.

One advantage of a survey is that the instrument, once developed, could easily be used at other institutions. Ultimately, a study involving multiple programs will provide the best indication of whether findings regarding differences in persistence are generalizable. To complement survey results, the approach used in the quantitative portion of the present study could readily be adapted to look at patterns of persistence and attrition in other education programs. While the teacher diversity

gap will not be easily closed, such future studies, and the policies and practices that emerge from them, could help traditional education programs advance efforts to do so. It is a goal worth pursuing.

Appendix A: Focus Group / Interview Protocol

1. Talk briefly about your decision (not) to become a teacher.
 - a. What role did your expectations regarding teacher salaries play in this decision?
 - b. What factors were most significant in making this decision (e.g. the prestige of teaching / other careers, attitudes about teaching on campus / in society)?
2. Talk about the activities, classes, and types of support that were most (least) helpful to you at UMBC as your pursued your goal of becoming a teacher.
3. Talk about the most significant challenges you encountered as a student in UMBC's education program.
4. What advice would you give to a student of color who is considering coming to UMBC and is interested in becoming a teacher?
5. What should UMBC do differently to attract more students of color to the education program and prepare them to be teachers?
6. Is there anything else related to your experiences in UMBC's education program that you would like to discuss?

Bibliography

- Achinstein, B., & Aguirre, J. (2008). Cultural match or culturally suspect: how new teachers of color negotiate sociocultural challenges in the classroom. *Teachers College Record*, 110(8), 1505–1540.
- Achinstein, B., Ogawa, R. T., Sexton, D., & Freitas, C. (2010). Retaining teachers of color: A pressing problem and a potential strategy for “hard-to-staff” schools. *Review of Educational Research*, 80(1), 71–107.
<https://doi.org/10.3102/0034654309355994>
- Albers, P. (2002). Praxis II and African American teacher candidates (or, is everything black bad?). *English Education*, 34(2), 105-125.
- Amos, Y. T. (2016). Voices of teacher candidates of color on white race evasion: ‘I worried about my safety!’ *International Journal of Qualitative Studies in Education*, 29(8), 1002–1015.
<https://doi.org/10.1080/09518398.2016.1174900>
- Andersen, L. B., Heinesen, E., & Pedersen, L. H. (2014). How does public service motivation among teachers affect student performance in schools?. *Journal of Public Administration Research and Theory*, 24(3), 651-671.
- Bailey, M. J., & Dynarski, S. M. (2011). Gains and gaps: Changing inequality in US college entry and completion (No. w17633). National Bureau of Economic Research.
- Bates, L. A., & Glick, J. E. (2013). Does it matter if teachers and schools match the student? Racial and ethnic disparities in problem behaviors. *Social Science Research*, 42, 1180–1190. <https://doi.org/10.1016/j.ssresearch.2013.04.005>
- Bennett, C., Cole, D., & Thompson, J. N. (2000). Preparing teachers of color at a predominantly White university: A case study of project TEAM. *Teaching and Teacher Education*, 16(4), 445-464.
- Bennett, C. I. (2002). Enhancing ethnic diversity at a Big Ten university through Project TEAM: A case study in teacher education. *Educational Researcher*, 31(2), 21-29.
- Bianco, M., Leech, N. L., & Mitchell, K. (2011). Pathways to teaching: African American male teens explore teaching as a career. *The Journal of Negro Education*, 368-383.
- Boser, U. (2014). Teacher Diversity Revisited: A New State-by-State Analysis. *Center for American Progress*.

- Bower-Phipps, L., Homa, T. D., Albaladejo, C., Johnson, A. M., & Cruz, M. C. (2013). Connecting with the "other" side of us: a cooperative inquiry by self-identified minorities in a teacher preparation program. *Teacher Education Quarterly*, 40(2), 29-51.
- Brown, J. W., & Butty, J. A. M. (1999). Factors that influence African American male teachers' educational and career aspirations: Implications for school district recruitment and retention efforts. *The Journal of Negro Education*, 68(3), 280.
- Canty, M. B. (2016). *"It's Equal but It's not Fair": The experiences of Teacher Candidates of Color in a Predominantly White Institution* (Doctoral dissertation). Retrieved from <https://digital.lib.washington.edu/443/researchworks/handle/1773/37090>
- Carter, D. J., & Wilson, R. (1993). Minorities in Higher Education. 1992 Eleventh Annual Status Report.
- Cherng, H. Y. S., & Halpin, P. F. (2016). The importance of minority teachers: Student perceptions of minority versus white teachers. *Educational Researcher*, 45(7), 407-420.
- Claycomb, C., & Hawley, W. D. (2000). Recruiting and Retaining Effective Teachers for Urban Schools: Developing a Strategic Plan for Action. Retrieved from <https://eric.ed.gov/?id=ED451147>
- Clewell, B. C., & Villegas, A. M. (2001). Evaluation of the DeWitt Wallace-Reader's Digest Fund's Pathways to Teaching Careers Program. Retrieved from Urban Institute website: <https://www.urban.org/research/publication/evaluation-dewitt-wallace-readers-digest-funds-pathways-teaching-careers-program>
- Cochran-Smith, M., Villegas, A. M., Abrams, L., Chavez-Moreno, L., Mills, T., & Stern, R. (2015). Critiquing teacher preparation research: An overview of the field, part II. *Journal of Teacher Education*, 66(2), 109-121.
- Cohn, D. (2016, June 23). It's official: Minority babies are the majority among the nation's infants, but only just. Retrieved March 19, 2018, from Pew Research Center website: <http://www.pewresearch.org/fact-tank/2016/06/23/its-official-minority-babies-are-the-majority-among-the-nations-infants-but-only-just/>
- Collier, M. D. (2002). Changing the face of teaching: Preparing educators for diverse settings. *Teacher education quarterly*, 29(1), 49.
- Cresswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. (2003). Advanced mixed methods research designs. In *Handbook of Mixed Methods in Social & Behavioral Research*. SAGE.

- Creswell, J. W., & Clark, V. L. P. (2007). *Designing and Conducting Mixed Methods Research*. Sage publications.
- Crewson, P. E. (1997). Public-service motivation: Building empirical evidence of incidence and effect. *Journal of public administration research and theory*, 7(4), 499-518.
- D'Amico, D., Pawlewicz, R. J., Earley, P. M., & McGeehan, A. P. (2017). Where are all the Black teachers? Discrimination in the teacher labor market. *Harvard Educational Review*, 87(1), 26-49.
- Darling-Hammond, L. (2000). Teacher Quality and Student Achievement. *Education Policy Analysis Archives*, 8(0), 1. <https://doi.org/10.14507/epaa.v8n1.2000>
- Darling-Hammond, L. (2000). Teacher quality and student achievement. *Education policy analysis archives*, 8, 1.
- Dee, T. S. (2004). Teachers, race, and student achievement in a randomized experiment. *Review of Economics and Statistics*, 86(1), 195-210.
- Dee, T. S. (2005). A teacher like me: Does race, ethnicity, or gender matter?. *American Economic Review*, 95(2), 158-165.
- DeMonte, J. (2015). A Million New Teachers Are Coming: Will They Be Ready to Teach?. *American Institutes for Research*. Retrieved from <https://eric.ed.gov/?id=ED557626>
- Dixson, A. D., & Dingus, J. E. (2007). Tyranny of the majority: re-enfranchisement of African-American teacher educators teaching for democracy. *International Journal of Qualitative Studies in Education*, 20(6), 639-654. <https://doi.org/10.1080/09518390701630775>
- Donovan, M. S., & Cross, C. T. (2002). *Minority Students in Special and Gifted Education*. National Academies Press, Washington, DC.
- Egalite, A. J., Kisida, B., & Winters, M. A. (2015). Representation in the classroom: The effect of own-race teachers on student achievement. *Economics of Education Review*, 45, 44-52. <https://doi.org/10.1016/j.econedurev.2015.01.007>
- Ehrenberg, R. G., Goldhaber, D. D., & Brewer, D. J. (1995). Do teachers' race, gender, and ethnicity matter? Evidence from the National Educational Longitudinal Study of 1988. *ILR Review*, 48(3), 547-561. <https://doi.org/10.1177/001979399504800312>
- Fensterwald, J. (n.d.). Undergraduate education major, banned for 56 years, returns. Retrieved July 20, 2019, from EdSource website:

<https://edsource.org/2017/undergraduate-education-major-banned-for-56-years-returns/585830>

- Flynn, J. E., Bieler, D., Kim, H., Rolón Dow, R., Worden, L., & Wong, C. (2015). Diversifying teacher education at a predominantly white institution: A public scholarship framework. In *Diversifying the teacher workforce: Preparing and retaining highly effective teachers* (pp. 168–183). Retrieved from https://scholar.google.com/scholar?hl=en&as_sdt=0%2C21&as_vis=1&q=%22diversifying+teacher+education+at+a+predominantly+white+institution%22&btnG=
- Ford, D. Y., Grantham, T. C., & Whiting, G. W. (2008). Culturally and linguistically diverse students in gifted education: Recruitment and retention issues. *Exceptional Children*, 74(3), 289-306.
- Frank, A. M. (2003). If they come, we should listen: African American education majors' perceptions of a predominantly white university experience. *Teaching and Teacher Education*, 19(7), 697-717.
- Gershenson, S., Hart, C., Hyman, J., Lindsay, C., & Papageorge, N. W. (2018). *The long-run impacts of same-race teachers* (No. w25254). National Bureau of Economic Research. <https://papers.ssrn.com/abstract=2940620>
- Gershenson, S., Holt, S. B., & Papageorge, N. W. (2016). Who believes in me? The effect of student–teacher demographic match on teacher expectations. *Economics of Education Review*, 52, 209–224. <https://doi.org/10.1016/j.econedurev.2016.03.002>
- Gitomer, D. H., Brown, T. L., & Bonett, J. (2011). Useful signal or unnecessary obstacle? The role of basic skills tests in teacher preparation. *Journal of Teacher Education*, 62(5), 431-445. <https://doi.org/10.1177/0022487111412785>
- Goings, R. B., & Bianco, M. (2016). It's hard to be who you don't see: An exploration of Black male high school students' perspectives on becoming teachers. *The Urban Review*, 48(4), 628-646. <https://doi.org/10.1007/s11256-016-0371-z>
- Goodlad, J. I. (1990). *Teachers for our nation's schools*. Jossey-Bass Inc., Publishers, 350 Sansome St., San Francisco, CA 94104.
- Gordon, J. A. (1994). Why students of color are not entering teaching: Reflections from minority teachers. *Journal of Teacher Education*, 45(5), 346-353. <https://doi.org/10.1177/0022487194045005007>
- Graham, A., & Erwin, K. D. (2011). "I don't think Black men teach because how they get treated as students": High-achieving African American boys'

- perceptions of teaching as a career option. *The Journal of Negro Education*, 398-416.
- Grissom, J. A., Kern, E. C., & Rodriguez, L. A. (2015). The “representative bureaucracy” in education: Educator workforce diversity, policy outputs, and outcomes for disadvantaged students. *Educational Researcher*, 44(3), 185-192.
- Grissom, J. A., Nicholson-Crotty, J., & Nicholson-Crotty, S. (2009). Race, region, and representative bureaucracy. *Public Administration Review*, 69(5), 911-919.
- Grissom, J. A., & Redding, C. (2015). Discretion and disproportionality: Explaining the underrepresentation of high-achieving students of color in gifted programs. *AERA Open*, 2(1), 2332858415622175. <https://doi.org/10.1177/2332858415622175>
- Grissom, J. A., Rodriguez, L. A., & Kern, E. C. (2017). Teacher and principal diversity and the representation of students of color in gifted programs: Evidence from national data. *The Elementary School Journal*, 117(3), 396-422.
- Guyton, E., Saxton, R., & Wesche, M. (1996). Experiences of diverse students in teacher education. *Teaching and Teacher Education*, 12(6), 643–652. [https://doi.org/10.1016/S0742-051X\(96\)00008-X](https://doi.org/10.1016/S0742-051X(96)00008-X)
- Hawley, W. D. (1989). The Importance of Minority Teachers to the Racial and Ethnic Integration of American Society. *Equity and Choice*, 5(2), 31-36.
- Hirshman, E. L., & Hrabowski, F. A. (2011, January 16). Meet Societal Challenges by Changing the Culture on Campus. *The Chronicle of Higher Education*. Retrieved from <https://www.chronicle.com/article/Meet-Societal-Challenges-by/125937>
- Hollins, E. R., & Guzman, M. T. (2005). Research on preparing teachers for diverse populations. *Studying teacher education: The report of the AERA panel on research and teacher education*, 477, 548.
- Holmes, B. J. (1990). New strategies are needed to produce minority teachers (Guest Commentary). In A. Dorman (Ed.), *Recruiting and retaining minority teachers*. Policy Brief No. 8. Oak Brook, IL: North Central Regional Educational Laboratory.
- Hrabowski, F., & Henderson, P. (2017). Toward a More Diverse Research Community: Models of Success | Issues in Science and Technology. *Issues in Science and Technology*, 33(3), 33-40. Retrieved from <http://issues.org/33-3/toward-a-more-diverse-research-community-models-of-success/>

- Ingersoll, R. M. (2002). The teacher shortage: A case of wrong diagnosis and wrong prescription. *NASSP bulletin*, 86(631), 16-31.
<https://doi.org/10.1177/019263650208663103>
- Ingersoll, R. M., & May, H. (2011). *Recruitment, retention and the minority teacher shortage*. Consortium for Policy Research in Education. CPRE Research Report# RR-69. <https://doi.org/10.12698/cpre.2011.rr69>
- Irizarry, J., & Donaldson, M. L. (2012). Teach for America: The Latinization of U.S. schools and the critical shortage of Latina/o teachers. *American Educational Research Journal*, 49(1), 155–194.
<https://doi.org/10.3102/0002831211434764>
- Irizarry, J. G. (2011). En La Lucha: The struggles and triumphs of Latino/a preservice teachers. *Teachers College Record*, 113(12), 2804–2835.
- Irvine, Jacqueline Jordan. (1989). Beyond role models: An examination of cultural influences on the pedagogical perspectives of Black teachers. *Peabody Journal of Education*, 66(4), 51–63.
- Jin, M. H., McDonald, B., & Park, J. (2018). Person–organization fit and turnover intention: Exploring the mediating role of employee followership and job satisfaction through conservation of resources theory. *Review of Public Personnel Administration*, 38(2), 167–192. <https://doi.org/10.1177/0734371X16658334>
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7), 14–26.
<https://doi.org/10.3102/0013189X033007014>
- Jones, R. I., & Jenkins, A. (2012). *Call Me MISTER: The re-emergence of African American male teachers in South Carolina*. Advantage Media Group.
- Jones, R., Holton, W., & Joseph, M. (2019). A Black male grow your own program. *Teacher Education Quarterly*, 46(1), 55.
- King, J. E., & Hampel, R. (2018). Colleges of education: A national portrait. Washington, DC: American Association of Colleges for Teacher Education. <https://aacte.org/resources/colleges-of-education-a-national-portrait>
- Klopfenstein, K. (2005). Beyond test scores: The impact of Black teacher role models on rigorous math taking. *Contemporary Economic Policy*, 23(3), 416–428.
<https://doi.org/10.1093/cep/byi031>
- Ladson-Billings, G. J. (2005). Is the team all right? Diversity and teacher education. *Journal of Teacher Education*, 56(3), 229–234.
<https://doi.org/10.1177/0022487105275917>

- Lau, K. F., Dandy, E. B., & Hoffman, L. (2007). The Pathways Program: A model for increasing the number of teachers of color. *Teacher Education Quarterly*, 34(3), 27–40.
- Leech, N. L., & Onwuegbuzie, A. J. (2009). A typology of mixed methods research designs. *Quality & Quantity*, 43(2), 265–275. <https://doi.org/10.1007/s11135-007-9105-3>
- Lewis, C. W. (2006). African American male teachers in public schools: An examination of three urban school districts. *Teachers College Record*, 108(2), 224–245. <https://doi.org/10.1111/j.1467-9620.2006.00650.x>
- Li, D., & Koedel, C. (2017). Representation and salary gaps by race-ethnicity and gender at selective public universities. *Educational Researcher*, 46(7), 343–354. <https://doi.org/10.3102/0013189X17726535>
- Lindsay, C. A., & Hart, C. M. D. (2017). Exposure to same-race teachers and student disciplinary outcomes for Black students in North Carolina. *Educational Evaluation and Policy Analysis*, 39(3), 485–510. <https://doi.org/10.3102/0162373717693109>
- Liu, E., Rosenstein, J. G., Swan, A. E., & Khalil, D. (2008). When districts encounter teacher shortages: The challenges of recruiting and retaining mathematics teachers in urban districts. *Leadership and Policy in Schools*, 7(3), 296–323.
- Loehr, P. (1988, October 5). The “urgent need” for minority teachers. *Education Week*. Retrieved from <https://www.edweek.org/ew/articles/1988/10/05/the-urgent-need-for-minority-teachers.html>
- Maryland State Department of Education. (2016). *Maryland Teacher Staffing Report 2016-2018*. Baltimore, MD. Retrieved from <https://eric.ed.gov/?id=ED572300>
- Matcznski, T. J., & Joseph, E. A. (1989). Minority teacher shortage: A proposal to counter the lack of activity. *Action in Teacher Education*, 11(2), 42–46.
- Maton, K. I. (2008). Empowering community settings: Agents of individual development, community betterment, and positive social change. *American Journal of Community Psychology*, 41(1–2), 4–21. <https://doi.org/10.1007/s10464-007-9148-6>
- Maton, K. I., Hrabowski, F.A., Ozdemir, H. Wimms, H. (2008). Enhancing representation, retention and achievement of minority students in higher education: A social transformation theory of change. *Toward Positive Youth Development: Transforming Schools and Community Programs*, ed. by M. Shinn & H. Yoshikawa, Oxford University Press, New York, 2008.

- Mau, W.-C. J., & Mau, Y.-H. (2006). Factors influencing high school students to persist in aspirations of teaching careers. *Journal of Career Development*, 32(3), 234–249. <https://doi.org/10.1177/0894845305282602>
- Meier, K. J. (1984). Teachers, students, and discrimination: The policy impact of Black representation. *The Journal of Politics*, 46(1), 252–263. <https://doi.org/10.2307/2130443>
- Meier, K. J. (1993). Latinos and representative bureaucracy: Testing the Thompson and Henderson hypotheses. *Journal of Public Administration Research and Theory: J-PART*, (4), 393.
- Mertens, D. M., & Hesse-Biber, S. (2012). Triangulation and mixed methods research: provocative positions. *Journal of Mixed Methods Research*, 6(2), 75–79. <https://doi.org/10.1177/1558689812437100>
- Miller, P. C., & Endo, H. (2005). Journey to becoming a teacher: The experiences of students of color. *Multicultural Education*, 13(1), 2.
- Morgan, P. L., Farkas, G., Cook, M., Strassfeld, N. M., Hillemeier, M. M., Pun, W. H., & Schussler, D. L. (2017). Are Black children disproportionately overrepresented in special education? A best-evidence synthesis. *Exceptional Children*, 83(2), 181-198.
- Morgan, P. L., Farkas, G., Cook, M., Strassfeld, N. M., Hillemeier, M. M., Pun, W. H., ... & Schussler, D. L. (2018). Are Hispanic, Asian, Native American, or language-minority children overrepresented in special education?. *Exceptional Children*, 84(3), 261-279.
- Murai, H., Berta-Avila, M., & Figueroa-Ramirez, K. (2019). Reflections and lessons learned. *Teacher Education Quarterly*, 46(1), 79.
- Musu-Gillette, L., de Brey, C., McFarland, J., Hussar, W., Sonnenberg, W., and Wilkinson-Flicker, S. (2017). *Status and Trends in the Education of Racial and Ethnic Groups 2017* (NCES 2017-051). U.S. Department of Education, National Center for Education Statistics. Washington, DC. Retrieved from <http://nces.ed.gov/pubsearch>
- Murnane, R. J. (2013). U.S. high school graduation rates: Patterns and explanations. *Journal of Economic Literature*, 51(2), 370–422.
- National Science Foundation. (2017). *Survey of Earned Doctorates, 2017*. Table 24. National Center for Science and Engineering Statistics. Retrieved from <https://nces.nsf.gov/pubs/nsf19301/data>.
- National Science Foundation. (2019). WebCASPAR Integrated Science and Engineering Resources Data System. Retrieved from <https://ncesdata.nsf.gov/webcaspar/>.

- Nettles, M. T., Scatton, L. H., Steinberg, J. H., & Tyler, L. L. (2011). Performance and passing rate differences of African American and White prospective teachers on Praxis examinations: A joint project of the National Education Association (NEA) and Educational Testing Service (ETS). *ETS Research Report Series*, 2011(1), i–82. <https://doi.org/10.1002/j.2333-8504.2011.tb02244.x>
- Odom, K. L., Roberts, L. M., Johnson, R. L., & Cooper, L. A. (2007). Exploring obstacles to and opportunities for professional success among ethnic minority medical students. *Academic Medicine*, 82(2), 146. <https://doi.org/10.1097/ACM.0b013e31802d8f2c>
- Onwuegbuzie, A. J., & Leech, N. L. (2007). A call for qualitative power analyses. *Quality & Quantity*, 41(1), 105–121. <https://doi.org/10.1007/s11135-005-1098-1>
- Pagano, M. E., Hirsch, B. J., Deutsch, N. L., & McAdams, D. P. (2003). The transmission of values to school-age and young adult offspring: Race and gender differences in parenting. *Journal of feminist family therapy*, 14(3-4), 13-36.
- Petchauer, E. (2016). Shall we overcome? Self-efficacy, teacher licensure exams, and African American preservice teachers. *The New Educator*, 12(2), 171–190. <https://doi.org/10.1080/1547688X.2016.1156456>
- Pitts, D. W. (2007). Representative bureaucracy, ethnicity, and public schools: Examining the link between representation and performance. *Administration & Society*, 39(4), 497–526. <https://doi.org/10.1177/0095399707303129>
- Poston, D. L., & Saenz, R. (2016). U.S. Whites will soon be the minority in number, but not power. *The Baltimore Sun*. Retrieved from <http://www.baltimoresun.com/news/opinion/oped/bs-ed-op-0809-minority-majority-20170808-story.html>
- Putman, H., Hansen, M., Walsh, K., & Quintero, D. (2016). High hopes and harsh realities: The real challenges to building a diverse workforce. The Brookings Institution. Brown Center on Education Policy. Washington, DC. https://www.brookings.edu/wp-content/uploads/2016/08/browncenter_20160818_teacherdiversityreportpr_hansen.pdf
- Reed, K. (2010). Multicultural education for rural schools: Creating relevancy in rural America. *Rural Educator*, 31(2).
- Rice, J. K., Roellke, C., Sparks, D., & Kolbe, T. (2009). Piecing together the teacher policy landscape: A policy problem typology. *Teachers College Record*, 111(2), 511–546.

- Richards, L., & Morse, J.M. (2013). *Readme first for a user's guide to qualitative methods*, 3rd Ed. Washington DC: Sage Publications.
- Rocha, R. R., & Hawes, D. P. (2009). Racial diversity, representative bureaucracy, and equity in multiracial school districts. *Social Science Quarterly*, 90(2), 326–344. <https://doi.org/10.1111/j.1540-6237.2009.00620.x>
- Rosinger, K., & Ford, K. S. (2019). Pell Grant Versus Income Data in Postsecondary Research. *Educational Researcher*, 48(5), 309–315. <https://doi.org/10.3102/0013189X19852102>
- Ryan, C.L. & Bauman, K. (2016). *Educational attainment in the United States: 2015*. U.S. Census Bureau. Washington, DC. Washington, DC. <https://www.census.gov/content/dam/Census/library/publications/2016/demo/p20-578.pdf>
- Shen, J. (1998). Alternative certification minority teachers and urban education. *Education and Urban Society*, 31(1), 30–41.
- Skiba, R. J., Horner, R. H., Chung, C.-G., & Rausch, K. (2011). Race is not neutral : A national investigation of African American and Latino disproportionality in school discipline. *School Psychology Review*, 40(1), 85–107.
- Skiba, R. J., Simmons, A. B., Ritter, S., Gibb, A. C., Rausch, M. K., Cuadrado, J., & Chung, C. G. (2008). Achieving equity in special education: History, status, and current challenges. *Exceptional Children*, 74(3), 264–288.
- Sleeter, C. E. (2001). Preparing teachers for culturally diverse schools: Research and the overwhelming presence of whiteness. *Journal of Teacher Education*, 52(2), 94–106. <https://doi.org/10.1177/0022487101052002002>
- Sleeter, C. E., & Milner, H. R. (2011). Researching successful efforts in teacher education to diversify teachers. *Studying diversity in teacher education*, 81–104.
- Sleeter, C., & Thao, Y. (2007). Guest editors' introduction: Diversifying the teaching force. *Teacher Education Quarterly*, 34(4), 3–8.
- Smithsonian Institution. (2017). *Fostering change: Ideas and best practices for diversity in STEM teaching in K-12 classrooms*. Smithsonian Science Education Center. Retrieved from <https://ssec.si.edu/sites/default/files/Fostering%20Change%20Playbook%20FINAL.pdf>.
- Stein, J., & Dam, A. V. (2018, February 6). Analysis: Trump immigration plan could keep Whites in U.S. majority for up to five more years. *Washington Post*. Retrieved from <https://www.washingtonpost.com/news/wonk/wp/2018/02/06/trump->

[immigration-plan-could-keep-whites-in-u-s-majority-for-up-to-five-more-years/](#)

- Su, Z. (1997). Teaching as a profession and as a career: Minority candidates' perspectives. *Teaching and Teacher Education*, 13(3), 325–340.
[https://doi.org/10.1016/S0742-051X\(96\)00021-2](https://doi.org/10.1016/S0742-051X(96)00021-2)
- Sutcher, L., Darling-Hammond, L., and Carver-Thomas, D. (2016). *A Coming Crisis in Teaching? Teacher Supply, Demand, and Shortages in the U.S.* Palo Alto, CA: Learning Policy Institute.
<https://learningpolicyinstitute.org/product/coming-crisis-teaching>
- Tillman, L. C. (2004). (Un)intended consequences?: The impact of the Brown v. Board of Education Decision on the employment status of Black educators. *Education and Urban Society*, 36(3), 280–303.
<https://doi.org/10.1177/0013124504264360>
- Ukpokodu, O. N. (2015). The turning point of one teacher education program: Recruitment, preparation, and retention of diverse teacher candidates. In *Diversifying the teacher workforce* (pp. 81-94). Routledge.
<https://www.taylorfrancis.com/books/e/9781317816539/chapters/10.4324%2F9781315818320-12>
- U.S. Department of Education . (2010). Civil rights data collection, 2009–2010: National and state estimations. Retrieved from http://ocrdata.ed.gov/StateNationalEstimations/Projections_2009_10
- U.S. Department of Education. (2016a). *The state of racial diversity in the educator workforce*. Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service, , Washington, D.C.
- U.S. Department of Education. (2016b). Spring 2002 through Spring 2013 and Winter 2013-14 through Winter 2015-16, graduation rates component; and IPEDS Fall 2009, institutional characteristics component. National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS). Retrieved from https://nces.ed.gov/programs/digest/d16/tables/dt16_326.10.asp.
- U.S. Department of Education. (2017a). Digest of Education Statistics, 2017. Table 209.10. National Center for Education Statistics. Retrieved from https://nces.ed.gov/programs/digest/d17/tables/dt17_209.10.asp?current=yes
- U.S. Department of Education. (2017b). Digest of Education Statistics, 2017. Table 105.50. National Center for Education Statistics. Retrieved from https://nces.ed.gov/programs/digest/d17/tables/dt17_105.50.asp
- U.S. Department of Education. (2019a). *Digest of Education Statistics, 2017* National Center for Education Statistics (NCES 2018-070). Table 105.50.

- U.S. Department of Education. (2019b). *Teacher Shortage Areas*. Retrieved from <https://tsa.ed.gov/#/reports>.
- U.S. Department of Education. (2019c). Public high school graduation rates. National Center for Education Statistics. Retrieved from https://nces.ed.gov/programs/coe/indicator_coi.asp.
- U.S. Department of Labor. (2017). 69.7 percent of 2016 high school graduates enrolled in college in October 2016. *The Economics Daily*. Bureau of Labor Statistics. Retrieved from <https://www.bls.gov/opub/ted/2017/69-point-7-percent-of-2016-high-school-graduates-enrolled-in-college-in-october-2016.htm>
- Vespa, J., Armstrong, D.M., & Medina, L. (2018) Demographic turning points for the United States: Population projections for 2020 to 2060. Current Population Reports, P25-1144, U.S. Census Bureau, Washington, DC.
- Villagómez, A. A., Easton-Brooks, D., Gomez, K., Lubbes, T., & Johnson, K. (2016). Oregon teacher pathway: Responding to national trends. *Equity & Excellence in Education*, 49(1), 100-114.
- Villegas, A., & Irvine, J. (2010). Diversifying the teaching force: An examination of major arguments. *Urban Review*, 42(3), 175–192. <https://doi.org/10.1007/s11256-010-0150-1>
- Villegas, A. M., & Davis, D. E. (2007). Approaches to diversifying the teaching force: Attending to issues of recruitment, preparation, and retention. *Teacher Education Quarterly*, 34(4), 137–147.
- Waddell, J. (2014). Supporting students of color in teacher education: Results from an urban teacher education program. *Journal of College Student Retention: Research, Theory & Practice*, 16(2), 261–275. <https://doi.org/10.2190/CS.16.2.f>
- Waddell, J., & Ukpokodu, O. N. (2012). Recruiting & preparing diverse urban teachers: One urban-focused teacher education program breaks new ground. *Multicultural Education*, 20(1), 15–22.
- Walker, V. S. (2000). Valued segregated schools for African American children in the South, 1935-1969: A review of common themes and characteristics. *Review of Educational Research*, 70(3), 253–285. <https://doi.org/10.2307/1170784>
- Ware, F. (2006). Warm demander pedagogy: Culturally responsive teaching that supports a culture of achievement for African American students. *Urban Education*, 41(4), 427–456. <https://doi.org/10.1177/0042085906289710>
- Waters, M. M. (1989). An agenda for educating Black teachers. *The Educational Forum*, 53(3), 267–279. <https://doi.org/10.1080/00131728909335609>

- Williams, D. A., Berger, J. B., & McClendon, S. A. (2005). *Toward a model of inclusive excellence and change in postsecondary institutions*. Washington, DC: Association of American Colleges and Universities.
- Wong, P. L., Murai, H., William-White, L., Baker, S., Arellano, A., & Echandia, A. (2007). The M/M Center: Meeting the demand for multicultural, multilingual teacher preparation. *Teacher Education Quarterly*, 34(4), 9–25.
- Wright, A., Gottfried, M. A., & Le, V. N. (2017). A kindergarten teacher like me: The role of student-teacher race in social-emotional development. *American Educational Research Journal*, 54(1_suppl), 78S-101S. <https://doi.org/10.3102/0002831216635733>
- Yarnell, L. M., & Bohrnstedt, G. W. (2018). Student-teacher racial match and its association with Black student achievement: An exploration using multilevel structural equation modeling. *American Educational Research Journal*, 55(2), 287-324. <https://doi.org/10.3102/0002831217734804>
- Yeh, M., Forness, S. R., Ho, J., McCabe, K., & Hough, R. L. (2004). Parental etiological explanations and disproportionate racial/ethnic representation in special education services for youths with emotional disturbance. *Behavioral Disorders*, 348-358.
- Yoon, E.-S., Gulson, K., & Lubienski, C. (2018). A Brief History of the Geography of Education Policy: Ongoing Conversations and Generative Tensions. *AERA Open*, 4(4), 2332858418820940. <https://doi.org/10.1177/2332858418820940>

