Examining the Beginning Teacher Workforce in Washington State: An Update with a Special Focus on Teachers of Color

Final Report

Prepared for the Office of Superintendent of Public Instruction

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Executive Summary

Purpose of the Report

The purpose of this report is to provide educators and policy makers in Washington state with information and analyses about statewide beginning teacher retention and mobility, and to inform and enhance decision making regarding supports for beginning teachers. We examine the characteristics of beginning teachers and look at factors associated with their retention and mobility. We pay special attention to beginning teachers located in districts that have received induction supports through the state's Beginning Educator Support Team (BEST) program and teachers of color. This inquiry serves as an update to a report issued in January 2017 regarding retention and mobility of beginning teachers in Washington state[1] by including four additional years of data (from 2015-16 to 2019-20).

Research Questions and Methods

The research questions for this study address four aspects of Washington's beginning teacher workforce (teachers with less than one year of experience). The first involves analysis of the characteristics of beginning teachers and their distribution across districts and schools. Second, we explore the retention and mobility patterns of beginning teachers, as well as all teachers statewide, and develop statistical models to identify factors that explain differences in retention and mobility rates statewide and in BEST-funded districts. Next, we explore the type of mentor model (colleague or released) used by BEST-funded districts. The final aspect of our inquiry is focused on teachers of color, including their characteristics and their retention and mobility rates. Specific research questions for each of these four aspects are provided below.

Characteristics and Distribution of Beginning Teachers
1) What are the demographic characteristics of beginning teachers in Washington state? How do the demographic characteristics of beginning teachers who are working in BEST-funded districts compare to all beginning teachers statewide?

Retention and Mobility
2) What differences, if any, exist in the retention and mobility of rates of beginning teachers from BEST-funded districts compared to those located in districts that did not receive BEST grants?
3) In what ways do differences in beginning teacher retention and mobility rates exist by: (a) demographic characteristics of teachers, (b) region of the state, (c) district and school demographics (e.g., size, poverty, student diversity) and (d) districts that received BEST grants compared to those that did not?
4) How do the retention rates of beginning teachers located in BEST-funded districts that met criteria as full-fledged induction programs compare to other BEST-funded districts and other beginning teachers statewide?

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[1] See Elfers, A., Plecki, M., & Van Windekens, A. (2017). Beginning Teacher Retention and Mobility in Washington State. A report prepared for the Office of the Superintendent of Public Instruction by the Center for the Study of Teaching and Policy, College of Education, University of Washington, Seattle.

Type of Mentor Model
5) Does the type of mentor model (colleague or released) used by districts vary by district size or other demographic characteristics?
6) Do district-level retention rates of first-year teachers vary based on the proportion of teachers supported under the type of mentor model used by the district?

Teachers of Color in Washington State
7) In which schools and districts are new teachers of color located and what kinds of assignments do they most frequently hold? What proportion of new teachers of color are located in BEST and full-fledged BEST-funded districts?
8) What differences, if any, exist in the retention and mobility of rates of beginning teachers of color and White beginning teachers statewide and in BEST and full-fledged BEST districts? How do retention and mobility rates vary within non-white teacher race/ethnicity groups and what factors influence this?

We use several data sources to conduct a statewide analysis of the retention and mobility patterns of beginning teachers and all teachers statewide. The primary data source is personnel data from the state's S-275 dataset. This dataset contains individual teacher level demographic and assignment information about all educators in Washington state. We link the S-275 data to other state databases, including school and district demographic data, to form a portrait of teacher retention and mobility. We have access to multiple years of data, enabling us to conduct longitudinal analyses that are comparable over time. After providing a portrait of the demographic characteristics of beginning teachers, we examine their year-by-year retention and mobility rates for the time period from 2015-16 to 2019-20. Specific comparisons are made at the district and school level for BEST districts. The year-by-year analyses are cohort-based. That is, we identify all beginning teachers in a given year, and then examine their individual assignments in the workforce in the subsequent year. Descriptive statistics are also provided for five-year retention and mobility rates for all teachers statewide and beginning teachers.

We also construct two-level logistic regression models using the R lme4 software package to help explain teacher retention and mobility, as this approach enables us to investigate the relationship between our dependent outcome variables of interest (retention and mobility status) and a number of continuous and categorical independent variables (e.g., district, school and individual teacher characteristics). Because our data has multilevel structures, with teachers nested within schools, schools nested in districts, and districts nested in regions, controlling random effects of school districts allows us to obtain valid regression estimates on retention or mobility without violating the assumption of independence. By assuming that the random effects come from a common distribution, a multilevel model can share information between groups. This can improve the precision of our predictions.

For our analyses of teachers of color, we used a single-level regression model because the number of teachers of color in Washington state is small. Consequently, we used a single level-logistic regression model with four ethnic/racial group comparisons (Asian/Pacific Islander vs Hispanic/Latinx, Black/African American vs Hispanic/Latinx, and Multiracial vs Hispanic/Latinx). Native American and Alaska Native teachers were not included in this analysis because their total numbers were too small to run accurate models.

The focal question for this analysis is: *What variables consistently explain beginning teachers' retention and mobility outcomes in Washington state?* We examine this question and compare outcomes for several groups of teachers: (1) all teachers in the state from all experience levels, (2) all beginning teachers statewide, (3) beginning teachers located in districts that received BEST funding and those located in districts identified as having full-fledged induction programs, and (4) teachers of color.

Key Findings

Results from our inquiry are summarized below:

- *The number of districts participating in the BEST program has increased steadily in recent years, resulting in a dramatic increase in the number of beginning teachers now working in BEST-funded districts.*

From 2015-16 to 2019-20, the number of participating districts has increased steadily, rising from 71 districts to 197. Similarly, the proportion of the state's beginning teachers who were located in BEST-funded districts dramatically increased from 53% in 2015-16 to 84% in 2019-20. This corresponds with an increasing number of new teachers statewide until 2019-20.

- *There is a notable decrease in the number of beginning teachers in 2019-20.*

The number of beginning teachers in 2019-20 represents a significant decrease in the number of beginning teachers in each of the prior five years (2014-15 to 2018-19). In those prior five years, the number of teachers increased from 3,372 in 2014-15 to nearly 4,000 in 2018-19. However, there was a drop of nearly 1,000 beginning teachers just in the past year (from 2018-19 to 2019-20).

- *More than half of beginning teachers now work in schools with poverty levels above 50%, and nearly half work in schools where students of color represent more than half of the student body.*

A larger proportion of beginning teachers are located in higher poverty schools compared to ten years ago (from 41% to 52% since 2009-10). There is a similar shift in the racial/ethnic composition of students of color (an increase of 13 percentage points since 2009-10). These shifts have potential implications for new teachers, 79% of whom are White.

- *Retention and mobility rates for beginning teachers are different than those for all teachers in the state.*

This is true for both year-by-year rates of retention and mobility and rates after five years. When examining retention and mobility rates for all teachers and beginning teachers, smaller percentages of beginning teachers stay in the same school, and larger percentages of beginning teachers move in district, out of district, and exit the Washington state system. In our statistical analyses of factors associated with retention and mobility, we found that there are statistically significant differences between the retention and mobility of all teachers in the state and all beginning teachers.

- *School poverty is not strongly associated with the percent of beginning teachers who stay in the same school, but it is a strong and negative predictor for all teachers in the state.*

The results from our statistical models examining retention of all teachers in the state demonstrate that when controlling for all other factors, school poverty is a unique and negative predictor of teacher retention in the same school. That is, lower percentages of teachers stay in schools serving higher proportions of students who are low-income compared to teachers working in schools with lower proportions of low-income students. This result is highly significant for all time periods examined in this study, and is consistent with results from other studies, both nationally and in other states. In contrast, for beginning teachers school poverty was only predictive for one time period examined with a relatively weak significance level.

- *Teachers who are full-time have better retention and mobility outcomes than teachers who are part-time.*

For both beginning teachers and all teachers in the state, full-time status is consistently and strongly predictive of teachers who stay in the same school from one year to the next. For all teachers in the state, full-time teachers are statistically less likely to exit the Washington state system than part-time teachers for all years examined. This same result holds for beginning teachers in some years.

- *High school teachers have different retention and mobility outcomes than elementary teachers.*

High school teachers are more likely to stay in the same school and less likely to move within the district as compared to elementary teachers. This is true for all teachers and beginning teachers. High school teachers are also more likely to move out of district and exit the Washington state system, but this result does not consistently hold for beginning high school teachers.

- *District size is a significant predictor of teacher mobility in and out of district.*

While district enrollment size is not associated with statistically significant differences for stayers or exiters, district size is a unique and powerful predictor of teachers who move in district and move out of district. This is the case for all teachers and for beginning teachers. Teachers in larger districts are more likely to move within the district, but less likely to move out of district. This result seems logical, as larger districts with more schools provide more options for teachers to move within the district. In smaller districts, teachers often need to move to another district for other employment options.

- *The choice of mentor model (colleague or released) varies by size of the district and region of the state.*

A much higher proportion of larger districts (those with 10,000 students or more) use a released mentor model as compared to smaller districts. Conversely, the overwhelming majority of districts with student enrollments below 1,000 use the colleague mentor model. Higher proportions of districts in the Central Puget Sound (ESD 121) use the released mentor model, likely due to the fact that a majority of the state's largest districts

are located in ESD 121.The colleague mentor model is more prevalent in districts located in Eastern Washington. Somewhat equal proportions of districts located in Western Washington outside ESD 121 use released and colleague mentor models. While mentor model type was included in initial statistical analyses as a predictor, mentor type was not associated with any statistically significant differences in retention and mobility outcomes.

- *Beginning teachers located in BEST-funded districts did not have statistically significant differences in retention and mobility outcomes from other beginning teachers.*

BEST status (including whether a BEST district is considered to have a full-fledged induction program) is not a unique predictor for any retention or mobility outcomes. While the dramatic increase in participation rates in the BEST program is certainly a positive policy outcome, it becomes more problematic in recent years to discern differences in the impact that the BEST program has compared to the steadily decreasing number of districts who do not receive BEST funding. Another possible factor impacting results is the significant amount of missing data regarding whether or not districts met the criteria for full-fledged BEST induction standards.

- *The state's teacher workforce is very slowly becoming more racially and ethnically diverse, but some racial/ethnic groups have shown little change over time.*

Hispanic/Latinx teachers represent the largest proportion of all teachers of color and also have the largest growth rates over time. Teachers who identify as Multiracial (more than one race) also are increasing at higher rates than other racial and ethnic groups. However, Black/African American and Native American/Alaska Native teachers have made few gains over time. This is occurring over a time period when the number and proportion of students of color in the state grows at a pace far greater than that for teachers of color. In the 2019-20 school year, 47% of students in the state were students of color, while only 12% of the state's teachers were teachers of color.

- *The regions of the state where teachers of color are located varies by individual racial and ethnic group.*

The majority of Black/African American teachers, Asian/Pacific Islanders, and Multiracial teachers are located in the Central Puget Sound region. However, nearly half of all Hispanic/Latinx teachers are located in Eastern Washington. Native American/Alaskan Native teachers are more evenly distributed across the different geographic regions of the state.

- *Most beginning teachers of color work in schools with higher levels of poverty and higher levels of students of color.*

Higher proportions of beginning teachers of color are located in schools where the percent of students of color is 75% or more. And conversely, lower proportions of teachers of color are located in schools where the percent of students of color is 25% or less. Greater proportions of beginning teachers of color are also located in schools where the percentage of students who are low-income is 75% or more.

- *Differences exist in the proportion of students of color located in larger districts by individual racial and ethnic group.*

When examining teachers of color in the workforce, it is also important to understand where students of color are located and whether differences exist among racial and ethnic groups. Students from some racial and ethnic groups are more concentrated in a small number of districts than students from other groups. The ten districts with the greatest number of Black/African American students served 60% of all Black/African American students, and there were 69 districts that did not serve any Black/African American students. Similar concentration levels are found for Asian students and Pacific Islanders. In contrast, the ten districts with the greatest number of Hispanic/Latinx students served only 29% of the total number of Hispanic/Latinx students in the state and only 6 districts in the state did not serve any Hispanic/Latinx students. Similarly, the ten districts with the largest numbers of White students serve only 25% of all White students with only 2 districts without White students.

- *Full-time status is a unique predictor for teachers of color staying in the same school. Statistical analyses also revealed differences among the racial/ethnic groups with regard to retention and mobility outcomes. In some years, beginning Hispanic/Latinx teachers are more likely to stay in the same school as compared to beginning Black/African American teachers. In some years, all Black/African American teachers (regardless of years of experience) have statistically lower rates of staying in the same school and higher rates of exiting as compared to all Hispanic/Latinx teachers in the state. In one year, beginning teachers identifying as Multiracial were significantly and negatively more likely to move within or out of their district compared to other non-stayers.*

As is the case for all teachers in the state, and all beginning teachers in the state, full-time teachers of color and full-time beginning teachers of color are more likely to stay in the same school as compared to part-time teachers of color. Retention rates for Hispanic/Latinx teachers are uniquely different and higher than those for Black/African Americans. These differences in retention are large and statistically significant. Similarly, in two of four time periods examined, Black/African American teachers are less likely to stay and more likely to exit as compared to all Hispanic/Latinx teachers in the state, with large differences between the two groups. Finally, we found some differences in mobility outcomes for teachers who identify as Multiracial (both among beginning teachers and teachers with more experience) and other comparison groups of teachers of color.

Discussion and Implications

We discuss several implications from the data and analyses we conducted, briefly summarized below:

- *In addition to quantity, it is also important to examine the quality of mentoring and the variety of supports available to assist beginning teachers.*

The quality of the training of mentor teachers and mentors' ability to provide helpful instructional feedback and build collaborative relationships within the school are also crucial. Furthermore, there are other aspects of support for new teachers that can help

them provide high quality instruction and improve their satisfaction with the profession. Additional factors include effective school and district leadership, access to high quality curricular supports, adequate resources, and strong relationships with families and the local community.

- *It will be important to gauge whether or not last year's significant decline in the number of beginning teachers continues in the years ahead, and assess the factors contributing to a decline.*

Since 2018-19, there have been significant changes in the state's funding model for teacher salaries, and perhaps this is one factor contributing to the significant decline in the number of beginning teachers in 2019-20. Changes in the compensation system may also cause some districts to re-assign certificated staff serving in instructional coaching, mentoring, and other support roles to classroom teaching responsibilities, thereby reducing demand for beginning teachers. The capacity for districts to hire and support beginning teachers may also be impacted by future budgetary challenges related to COVID-19.

- *Particular attention should be paid to induction supports for beginning teachers of color.*

For the state's BEST program, attention should be paid to improving the racial and ethnic diversity of the mentor teacher cadre. It may be beneficial to consider how the mentor selection process can help ensure an appropriate match for new teachers of color. This will require a willingness to recognize and acknowledge racial and ethnic differences in supporting staff and students. Mentoring is perhaps the most obvious form of support for beginning teachers, but there are areas, such as curricular resources, relationships with families and communities, and school leadership where a recognition of racial and ethnic differences is necessary.

- *It is important to examine differences in retention and mobility outcomes for teachers of color by using disaggregated data for each unique racial and ethnic group.*

In this study, we uncovered important differences in the distribution, retention, and mobility for teachers of color by individual racial and ethnic groups. There are implications regarding efforts to diversify the teacher workforce because Hispanic/Latinx beginning teachers have better retention and mobility outcomes than other beginning teachers of color.

- *Examination of the reasons why part-time status negatively impacts teacher retention and mobility is warranted.*

For both beginning teachers and all teachers statewide, our inquiry found that one of the strongest and most consistent predictors of increased teacher retention was having a full-time assignment. There are a number of potential reasons why a teacher has a part-time assignment, including the individual preference of the teacher. However, other factors may also be at play, including a district's lack of ability to offer a full-time assignment, perhaps due to inadequate resources.

- *Future studies of the effectiveness of teacher induction supports should include a variety of research methods.*

The data in this study was limited to quantitative measures, but other types of inquiry may be well-suited to advance our knowledge of how best to support and retain a diverse, well-qualified beginning teacher workforce. Other forms of inquiry include case studies of districts who vary in their approach to induction supports, surveys of beginning teachers, teacher mentors, and other school leaders regarding strategies for successful implementation of induction, and focus groups aimed to understand the perspectives of teachers by individual racial and ethnic groups.

Introduction

A. Study Purpose

The purpose of this report is to provide educators and policy makers in Washington state with information and analyses about statewide beginning teacher retention and mobility, and to inform and enhance decision making regarding supports for beginning teachers. We examine the characteristics of beginning teachers and look at factors associated with their retention and mobility. We pay special attention to beginning teachers located in districts that have received induction supports through the state's Beginning Educator Support Team (BEST) program and teachers of color. This inquiry serves as an update to a report issued in January 2017 regarding retention and mobility of beginning teachers in Washington state[1] by including four additional years of data (from 2015-16 to 2019-20).

B. Relevant Literature

Teaching is a challenging career, and many are worried that too few teachers are entering and remaining in the workforce. Teacher attrition is higher in the early years of teaching (Goldring, Taie, & Riddles, 2014; Murnane, Singer & Willet, 1988, Lortie, 1975; Shen, 1997). Teacher turnover can be costly and negatively affect the cohesiveness and effectiveness of school communities by disrupting educational programs and professional relationships intended to support student learning (Borman & Dowling, 2008; Bryk, Lee & Smith, 1990; Ingersoll, 2001; Ronfeldt, Loeb, & Wyckoff, 2013). New teachers often need targeted support as they learn how to plan, execute, evaluate, and adjust content-specific instruction for heterogeneous groups of learners, and learn to navigate the particular state, district, and school cultures and contexts in which they find themselves (Feiman-Nemser, 2003; Achinstein & Barrett, 2004).

1. Mentoring and induction programs

Induction programs are a widespread approach used to support the professional growth of beginning teachers and increase retention rates (Ingersoll, 2012).Teacher induction programs are designed to assist the ongoing development of teachers' skills in their first years in the classroom and prevent them from abandoning the profession (Feinman-Nemser, 2001; Wang, Odell & Schwille, 2008). Early career supports are associated with improvements in teacher effectiveness (Smith & Ingersoll, 2004). Prior research also indicates that the preparation and supports teacher receive as they transition into the profession can influence whether or not they exit the profession early (DeAngelis, Wall & Che, 2013). In a longitudinal study of new teachers in Massachusetts, Johnson and Birkeland (2003) found that experiences at the school site were central in influencing new teachers' decisions to stay in their schools and in teaching. They argue that novice teachers' professional success and satisfaction is tied to the particular school site and that working conditions found to support their teaching include collegial interaction, opportunities for growth, appropriate assignments, adequate resources and school-wide structures to support student learning. These issues may be particularly acute for new teachers in low-income schools (Johnson et al., 2004).Based on surveys of new teachers, these authors found large and statistically significant differences in the mentoring support provided to new teachers in low-income schools compared to their counterparts in high-income schools.

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[1] See Elfers, A., Plecki, M., & Van Windekens, A. (2017). Beginning Teacher Retention and Mobility in Washington State. A report prepared for the Office of the Superintendent of Public Instruction by the Center for the Study of Teaching and Policy, College of Education, University of Washington, Seattle.

Mentoring by a school or district staff member is often a primary component of induction support for new teachers. However, there is considerable variability in the supports provided to new teachers. National statistics indicate that among teachers with one year of experience in 2015-16, two-thirds reported participation in an induction program, and of those, 74% were assigned a mentor (US DOE, 2016a). In examining the outcomes of a mentoring program in New York City, Rockoff (2008) found a strong relationship between various measures of mentoring quality and new teachers' reported experiences of success in the classroom, with evidence of increased student achievement associated with more hours of mentoring. In a study of district mentoring programs for new teachers in five Midwest states, researchers found that in 69% of districts, mentoring was provided by full-time teachers without release time from teaching responsibilities. Roughly half of these districts required mentors to observe mentees teach, and only 32% of districts required the mentors to receive training prior to mentoring (DeCesare, Workman & McClelland, 2016), suggesting considerable variability in the implementation of induction and mentoring supports.

Evidence suggests that the quality and comprehensiveness of the induction supports matter for the retention of new teachers (DeAngelis et al., 2013; Kapadia et al., 2007; Smith & Ingersoll, 2004). Some studies also found that teachers who receive intensive induction support during the early years of teaching have improved student learning outcomes (Fletcher, Strong & Villar, 2008; Rockhoff, 2008). Ingersoll and Strong's (2011) review of the induction literature found generally favorable results for teacher induction supports and retention, though there were a few studies with mixed results or no association. For example, six of seven induction and mentoring studies reviewed by Ingersoll and Strong demonstrated positive effects on beginning teacher retention and commitment, including analysis of a statewide program in Texas. Glazerman et al. (2010) in a large scale, randomized control trial found positive and statistically significant student achievement outcomes for teachers after three years when they received comprehensive induction support during their first two years of teaching. However, causally linking participation in comprehensive induction to retention found "no significant differences between those in the treatment and control groups after each of the 3 years of follow-up" (Ingersoll & Strong, 2011, p. 221).[1]

With data from nationally representative surveys of new teachers (Schools and Staffing, Teacher follow-up Surveys and the Beginning Teacher Longitudinal Study), Ronfeldt and McQueen (2017) used a variety of statistical models to determine that teachers who received more extensive induction supports were significantly less likely to move to other schools or leave the profession. Results suggest that extensive induction supports reduced movement to other schools by 5% compared with those not receive receiving such supports, and reduced leaving the profession by 4.8%. They summarize, "Each additional support was associated with (a) a reduction in the odds of moving schools by 20% to 24% in the second year and by 10% to 14% across 5 years and (b) a reduction in the odds of leaving teaching by 18% to 22% in the second year and by 15% to 18% across 5 years" (p. 406).

Wide variation in the availability, comprehensiveness and quality of induction programs may be a contributing factor to contradictory findings. Ingersoll and Strong (2011) conclude that the quality of induction programs is important to consider when assessing impact on teacher outcomes. For example, DeAngelis et al. (2013) found no direct impact of simply having a mentor on new teachers' intentions to move schools or leave the profession. However, they found significant results when they took into account the quality of mentoring (based on teachers' perceptions of the helpfulness of the mentor) and the breadth of mentoring and induction activities. They write, "…teachers who were provided more comprehensive support

were significantly less likely to intend to move or leave than teachers with no support or less comprehensive support" (p 344), and note the similarity to findings by Kapacia, et al. (2007). When examining teachers' actual retention and mobility decisions after the first year, they found that having more comprehensive mentoring and induction support "decreased the odds of new teachers changing districts and leaving the profession after the first year" (p. 350).

Participation in a combination of mentoring and group induction programs may reduce beginning teacher turnover (Ingersoll & Strong, 2011), though the qualitative distinctions among these programs and their relative cost-effectiveness are not always clear (Ingersoll & Kralik, 2004). Similarly, Smith and Ingersoll (2004) noted that multiple types of induction supports taken together had an impact on turnover rates, in contrast to teachers participating in only a few induction activities. Bastian and Marks' (2017) assessment of university-based novice teacher support programs in low-income schools in North Carolina, reported positive performance and retention results for those participating in the most intensive programs and for teachers receiving more coaching. Taken together, these results suggest the potential of comprehensive approaches and attention to the quality of induction supports.

2. Teachers of color

For many years, scholars, policymakers, and practitioners across the nation have noted the lack of racial and ethnic diversity in the teacher workforce, especially when compared to the increasing diversity of students. Many states have undertaken specific policies aimed at attracting and retaining teachers of color, and there is a broad consensus that increasing the number of teachers of color is of vital importance. Research has documented the many strengths of a more diverse workforce, as teachers of color often serve as cultural translators, have a greater awareness of racial trauma, and are associated with more positive academic and social-emotional outcomes for students of color (Carver-Thomas, 2018; Philip & Brown, 2020). A growing body of research has been investigating the efforts to diversify the profession and the retention and mobility rates of teachers of color (Villegas, et al., 2012).

A number of studies have used national datasets and surveys to explore differences in retention rates for teachers of color. Analyses of national data shows that over the past several decades, there has been a slow rise in the number and the proportion of public school teachers who are individuals of color (US DOE, 2016b). For example, in 1987-88, the proportion of teachers of color was 13.1%. By 2015-16 that percentage increased to only 19.9% (Ingersoll et al., 2018). National data also indicates that most of the increase in the number of teachers of color has been in higher-poverty public schools, with teachers of color being two to three times more likely than white teachers to work in high-poverty schools, urban schools, schools with higher proportions of students of color, and schools with higher turnover rates (Ingersoll & Merrill, 2017).

Some research indicates that the sluggish rate of increase in the number of teachers of color is partly attributable to higher attrition rates of teachers of color. Ingersoll and colleagues (2018) analyzed national teacher survey data regarding the reasons why teachers of color decide to stay or to leave. They found that school working conditions, especially regarding the level of classroom autonomy, individual discretion, and collective influence teachers have regarding school-wide decisions are very important to teachers of color in making decisions about whether or not they will remain in a school.

While the population of teachers of color as a collective group is growing to some extent, several researchers have noted that increases are not consistent across some individual racial

and ethnic groups. In particular, the proportion of Black/African American and Native American teachers has declined in recent years. Nationwide, Black/African American teachers made up more than 8% of teachers in 1987 but made up only 6.7% in 2015. Similarly, the share of Native American teachers declined from 1.1% in 1987 to 0.4% in 2015. However, the percentage of Hispanic/Latinx teachers increased from 2.9% in 1987 to 8.8% in 2015 (Carver-Thomas, 2018).

Recent research has called for more complex understandings of teacher diversity, particularly when it comes to examining the broader school culture and societal contexts in which teachers work (Philip & Brown, 2020). Scholars also acknowledge that contexts and conditions can vary by individual racial and ethnic group and can impact teacher attrition, especially for Black teachers (Carter Andrews, et al., 2019; Sun, 2018). For example, there is a history of Black/African American teachers being excluded and dismissed from teaching positions, particularly after the 1954 *Brown v Board of Education* decision (Philip & Brown, 2020). Furthermore, barriers to entry into the teaching profession (such as testing and licensure requirements and student debt) disproportionately impact teachers of color (especially Black teachers) and there is an increased likelihood of school closures where Black/African American teachers and Hispanic/Latinx teachers are located (Ahman & Boser, 2014; Petchauer, Bowe & Wilson, 2018; Philip & Brown, 2020). Recent literature about teachers of color also suggest strategies that can be adopted to increase supports for beginning teachers of color, including better induction supports, more supportive leadership, additional supports for teacher candidates, increased compensation, housing assistance, and the adoption of teacher residencies and loan forgiveness (Carver-Thomas, 2018; Carver-Thomas & Darling-Hammond, 2017). In this report, we include a focus on teachers of color within the Washington state context.

C. Overview of the BEST Program

Washington state has provided some state support for beginning teachers since 1987, initially through the Teacher Assistance Program (TAP). The total amount of funding for TAP remained constant over the years, while the number of beginning teachers increased, thereby reducing the amount of funding available per teacher. Then in 2009-10, the Washington state legislature authorized the development and funding of the Beginning Educator Support Team (BEST) program. This program promotes strategies for improving district and regional capacity to retain and support beginning teachers. According to the Office of the Superintendent of Public Instruction (OSPI), the goals of the BEST program are: 1) to close learning gaps experienced by novice teachers when they enter a new system so they can close their students' learning gaps, 2) to attract and retain skillful novice teachers in Washington's public schools, and 3) to build comprehensive, coordinated systems of support within school districts to sustain induction work. New teachers in districts receiving BEST funding are given an instructional orientation and/or individualized assistance prior to the start of school or the start of the new educator's assignment to acquaint them with district and school expectations and culture, orient them to preferred instructional practices and curriculum, and help them plan for their first day, weeks and month with students. They receive mentoring from vetted and trained colleagues who are provided release time to observe and provide feedback on their teaching. In addition to professional development on topics relevant to their needs, professional learning is aligned to the Washington State 8 Teacher Evaluation Criteria (or other professional standards when relevant) and the district's adopted instructional framework and initiatives.

The BEST program provides state funding for competitive grants to districts and regional consortia, and also funds professional development for instructional mentors throughout the state. However, BEST funding for induction supports has not been available to all 295 districts

due to insufficient state funding. Rather than spread a small amount of money across all districts, OSPI opted to more adequately fund a smaller number of districts by creating a competitive grant and raising the funding allocation per beginning teacher. The competitive grant process is based on evidence of district need and readiness to implement the state's "Standards for Beginning Educator Induction" (OSPI, updated 2018). Funding to participating districts is based on the number of first year teachers, at approximately $2,000 per beginning teacher. Part-time new teachers were funded at the same rate, consequently there was an incentive to serve them (part-time teachers were included in our analysis).

Fluctuating amounts of funding from subsequent legislative cycles resulted in varying numbers of districts served by the program in each year. In the first year of the BEST program there were 30 participating districts, but the number of funded districts varied substantially in the five subsequent years, with only 7 districts funded in 2013-14. However, in the five most recent years (2015-16 to 2019-20), the number of participating districts has increased steadily, rising from 71 districts to 197. Figure 1 below provides data regarding the number of participating districts for the period from 2009-10 (when the BEST program began) through the 2019-20 school year.

Figure 1: Number of Districts with BEST Grants Per Year: 2009-10 to 2019-20
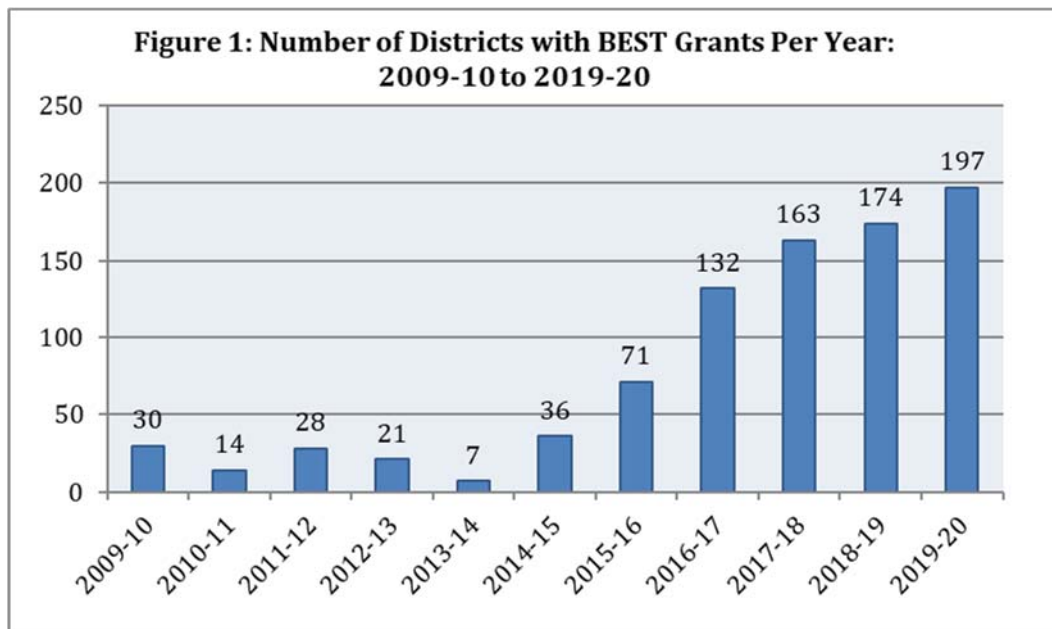
The variation in the number of funded districts positively impacted the proportion of beginning teachers in the state who received support through the BEST program. During the time period from 2009-10 to 2019-20, the percent of all beginning teachers located in funded districts ranged from 7% to 84% of all beginning teachers statewide. The proportion of the state's beginning teachers served by BEST-funded districts has dramatically increased in the most recent five-year period, from 53% in 2015-16 to 84% in 2019-20. Consequently, more than four-fifths (84%) of the state's beginning teachers are now served by the BEST program.

Figure 2: BEST Teachers as a Percent of All Beginning Teachers: 2009-10 to 2019-20

Year	Percent
2009-10	20%
2010-11	16%
2011-12	10%
2012-13	9%
2013-14	7%
2014-15	32%
2015-16	53%
2016-17	70%
2017-18	81%
2018-19	78%
2019-20	84%
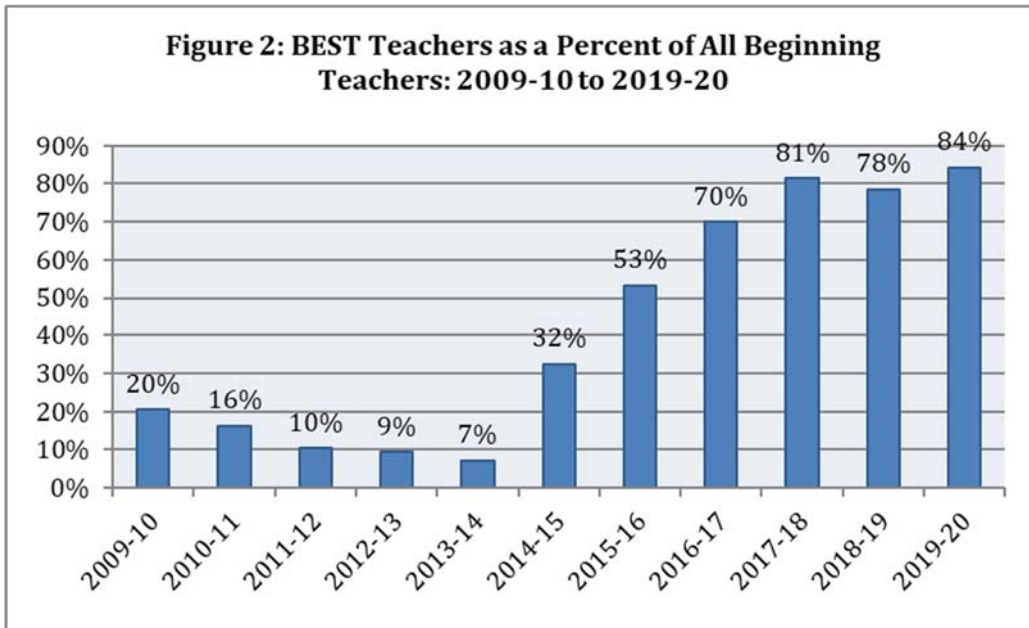
D. Prior Research on Beginning Teacher Retention in Washington State

As mentioned previously, we have engaged in prior research on beginning teacher retention and mobility in Washington state, including analyses of differences in beginning teacher retention in BEST-funded districts compared to districts that did not receive BEST funding. We found that the majority of beginning teachers (on average 70%) stay in their school from one year to the next, 11% move within the district and 7% move out of district. We also found that, on average, 12% exit the workforce in the following year. When examining yearly retention rates for beginning teachers in BEST-funded districts for the years 2009-10 to 2015-16, we found that beginning teachers in BEST-funded districts were retained in their school at somewhat higher rates than beginning teachers statewide (77% vs 73%). This study will shed light on whether or not retention and mobility patterns for the years 2015-16 to 2019-20 differ from what we learned from prior years.

In our prior research, we also examined a specific set of districts that met state standards for full-fledged implementation of an induction program. We found that beginning teachers in such districts had a lower rate of exiting the Washington workforce after one year than other beginning teachers. This result was statistically significant. However, during the time period examined for this prior study, the number of districts that met the state standards for high quality induction was small. Given that participation in the BEST program has notably increased in the years since the prior study was conducted, further examination of the characteristics and impact of the BEST program is warranted.

Research Approach and Methods

A. Research Questions

The research questions for this study address four aspects of Washington's beginning teacher workforce (teachers with less than one year of experience). The first involves analysis of the characteristics of beginning teachers and their distribution across districts and schools. Second, we explore the retention and mobility patterns of beginning teachers, as well as all teachers statewide, and develop statistical models to identify factors that explain differences in retention and mobility rates statewide and in BEST-funded districts. Next, we explore the type of mentor model (colleague or released) used by BEST-funded districts. The final aspect of our inquiry is focused on teachers of color, including their characteristics and their retention and mobility rates. Specific research questions for each of these four aspects are provided below.

Characteristics and Distribution of Beginning Teachers

1) What are the demographic characteristics of beginning teachers in Washington state? How do the demographic characteristics of beginning teachers who are working in BEST-funded districts compare to all beginning teachers statewide?

Retention and Mobility

2) What differences, if any, exist in the retention and mobility of rates of beginning teachers from BEST-funded districts compared to those located in districts that did not receive BEST grants?
3) In what ways do differences in beginning teacher retention and mobility rates exist by: (a) demographic characteristics of teachers, (b) region of the state, (c) district and school demographics (e.g., size, poverty, student diversity) and (d) districts that received BEST grants compared to those that did not?
4) How do the retention rates of beginning teachers located in BEST-funded districts that met criteria as full-fledged induction programs compare to other BEST-funded districts and other beginning teachers statewide?

Type of Mentor Model

5) Does the type of mentor model (colleague or released) used by districts vary by district size or other demographic characteristics?
6) Do district-level retention rates of first-year teachers vary based on the proportion of teachers supported under the type of mentor model used by the district?

Teachers of Color in Washington State

7) In which schools and districts are new teachers of color located and what kinds of assignments do they most frequently hold? What proportion of new teachers of color are located in BEST and full-fledged BEST-funded districts?
8) What differences, if any, exist in the retention and mobility rates of beginning teachers of color and White beginning teachers statewide and in BEST and full-fledged BEST districts? How do retention and mobility rates vary within non-white teacher race/ethnicity groups and what factors influence this?

B. Methodology and Data Sources

We use several data sources to conduct a statewide analysis of the retention and mobility patterns of beginning teachers. The primary data source is personnel data from the state's S-275 dataset. This dataset contains individual teacher level demographic and assignment information about all educators in Washington state. We link the S-275 data to other state databases, including school and district demographic data, to form a portrait of teacher retention and mobility. We have access to multiple years of data, enabling us to conduct longitudinal analyses that are comparable over time. After providing a portrait of the demographic characteristics of beginning teachers, we examine their year-by-year retention and mobility rates for the time period from 2015-16 to 2019-20. Specific comparisons are made at the district and school level for BEST districts. The year-by-year analyses are cohort-based. That is, we identify all beginning teachers in a given year, and then examine their individual assignments in the workforce in the subsequent year. Descriptive statistics are also provided for five-year retention and mobility rates for all teachers statewide and beginning teachers.

We also construct two-level logistic regression models using the *R lme4* software package to help explain teacher retention and mobility, as this approach enables us to investigate the relationship between our dependent outcome variables of interest (retention and mobility status) and a number of continuous and categorical independent variables (e.g., district, school and individual teacher characteristics). Because our data has multilevel structures, with teachers nested within schools, schools nested in districts, and districts nested in regions, controlling random effects of school districts allows us to obtain valid regression estimates on retention or mobility without violating the assumption of independence. By assuming that the random effects come from a common distribution, a multilevel model can share information between groups. This can improve the precision of our predictions. The focal question for this analysis is: *What variables consistently explain beginning teachers' retention and mobility outcomes in Washington state?*

We examine this question and compare outcomes for several groups of teachers: (1) all teachers in the state from all experience levels, (2) all beginning teachers statewide, (3) beginning teachers located in districts that received BEST funding and those identified as having full-fledged induction programs, and (4) teachers of color.

C. Definition of Terms

As noted above, we provide analyses of retention and mobility rates for all beginning teachers statewide and for beginning teachers in districts served by the BEST program. We describe the criteria for the teachers included in these analyses as follows:

- *Beginning Teachers* were defined as those public school teachers with less than one year of experience as reported in the S-275 whose assignment is the instruction of pupils in a classroom situation and who have a designation as an elementary teacher, secondary teacher, other classroom teacher, or elementary specialist teacher.[2] Other teachers serving in specialist roles (e.g., reading resource specialist, library media specialist) were not included.

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[2] As reported by the Office of the Superintendent of Public Instruction, classroom teachers are certificated instructional staff with a duty root designation of 31, 32, 33 or 34. Teachers whose full-time equivalent (FTE) designation was zero for the initial year were excluded from the analysis.

- *BEST Teachers* were defined as those public school teachers with less than one year of experience as reported in the S-275 who worked in a district that received BEST funding in particular years of interest.

To examine retention and mobility patterns, teachers are placed in one of four categories:

- "Stayers" – teachers assigned to the same school(s) in the initial school year and also in the subsequent year.

- "Movers in" – teachers who moved to other schools in the same district, or changed assignment (other than a classroom teacher) within the same district.

- "Movers out" – teachers who moved to other districts, either as a classroom teacher or in some other role.

- "Exiters" – teachers who exited the Washington education system, either temporarily or permanently.[3]

To understand how districts vary in their approach to one aspect of induction supports, we identify districts by the type of mentor model used:

- *Colleague Mentor* refers to an experienced educator who mentors new teachers in addition to their teaching or other responsibilities. The maximum ratio is two new teachers per one colleague mentor. Colleague mentors are expected to observe the new teacher(s) at least quarterly.

- *Released Mentor* refers to an experienced educator who is released from teaching or other responsibilities to allow dedicated, weekly time for mentoring of new teachers. The maximum ratio for released mentors with no other responsibilities is 20 new teachers per one mentor. Released mentors are expected to observe each new teacher at least 8 times per year.

D. Study Limitations

While this study provides an analysis of beginning teacher retention and mobility, including factors that may impact turnover rates, we do not examine some related issues. First, we do not address the reasons why teachers choose to move to other schools or districts, or why they decide to leave the profession, either temporarily or permanently. Issues such as increased workload, quality of school and district leadership, support from parents and community, and personal and family factors are all known to influence teacher's views about their careers. We also do not distinguish between teachers who choose to make a change in their assignment or location, and those who have been involuntarily transferred or did not have their contracts renewed. Additionally, we make no claims about the quality of the performance of teachers who stay in their schools, move to another school or district, or leave the profession.

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[3] Exiters may have retired, re-entered the system in subsequent years, left Washington to teach in another state, or completely left the profession. It is not possible to distinguish voluntary and involuntary departures. It is not possible to determine whether teachers who left the state continued to be employed as teachers elsewhere.

Findings

A. Characteristics and Distribution of Washington's Beginning Teacher Workforce

In this section, we first provide information about the characteristics of all teachers in Washington state in order to place data about beginning teachers into the broader context of the state's teacher workforce. We then discuss data about beginning teacher demographic characteristics, including a discussion of the district and school contexts in which beginning teachers work. Finally, we provide a portrait of beginning teachers who work in districts funded by the BEST program, with an additional focus on beginning teachers of color.

1. Demographic characteristics of all teachers statewide

Over the past 15 years (2005-06 to 2019-20), we find both similarities and changes in trends over time regarding the characteristics of the teacher workforce. One similarity over time is that the majority of teachers are female. The percentage of female teachers consistently approaches three quarters of the workforce, ranging from 71% to 74% over the fifteen-year period. In addition, the majority of Washington teachers hold a master's degree, with the trend over time showing a gradual increase in the proportion of teachers with a master's degree, from 61% in 2005-06 to 67% in 2019-20.

We also find some differences over time in the demographic characteristics of all teachers in the state for the period from 2005-06 to 2019-20 in terms of age, experience, race and ethnicity. There were increases in the proportion of teachers who are 61 years of age or older, rising from 4% in 2005-06 to 8% in 2019-2020, with a peak of 9% in 2012-13.This age group represents teachers who are more likely to retire in the near future. When examining the distribution of the state's teachers by years of experience, we find fluctuations over time. Fifteen years ago (2005-06), 22% of teachers were novices (less than 5 years of experience). However, that percentage dropped to 16% in 2011-12, then gradually rose to 25% for each of the three years from 2016-17 to 2018-19. In the most recent year (2019-20), 23% of teachers were novices. There is also a decrease in the proportion of teachers with 25 years of experience or more, from 16% in 2005-06 to 14% in 2019-20.

Trends over time indicate that the state's teacher workforce is slowly becoming more racially and ethnically diverse in a few aspects. However, some racial/ethnic groups have shown no change over time and the vast majority of the state's teachers are White. The proportion of White teachers decreased over the fifteen-year period, from 93% in 2005-06 to 88% 2019-20. The most notable change is found with teachers who identify as Hispanic/Latinx, steadily rising from 2.4% in 2005-06 to 5.1% in 2019-20. However, there is no change in the proportion of teachers who identify as American Indian/Alaskan Native, holding constant at less than 1% (either .8% or .7% in each of the fifteen years). Additionally, the proportion of Black/African American teachers has not changed over time, with slight a decrease from 1.5% in 2005-06 to 1.4% in 2019-20 (and a low of 1.2% for 4 of the years examined). Appendix A contains details regarding the characteristics of the statewide teacher workforce for the fifteen-year period from 2005-06 to 2019-20.

2. Demographic characteristics of beginning teachers

Over the past ten years, the number of beginning teachers has increased from 1,960 in 2010-11 to 3,002 in 2019-20. However, the number of beginning teachers in 2019-20 represents a significant decrease in the number of beginning teachers in each of the prior five years (2014-15 to 2018-19). In those prior five years, the number of teachers increased from 3,372 in 2014-15 to nearly 4,000 (3,941). This represents nearly a drop of 1,000 in the number of beginning teachers from 2018-19 to 2019-20. Figure 3 depicts the number of beginning teachers statewide over the eleven-year period since the BEST program began (from 2009-10 to 2019-20).

Figure 3: Number of Beginning Teachers in Washington State: 2009-10 to 2019-20
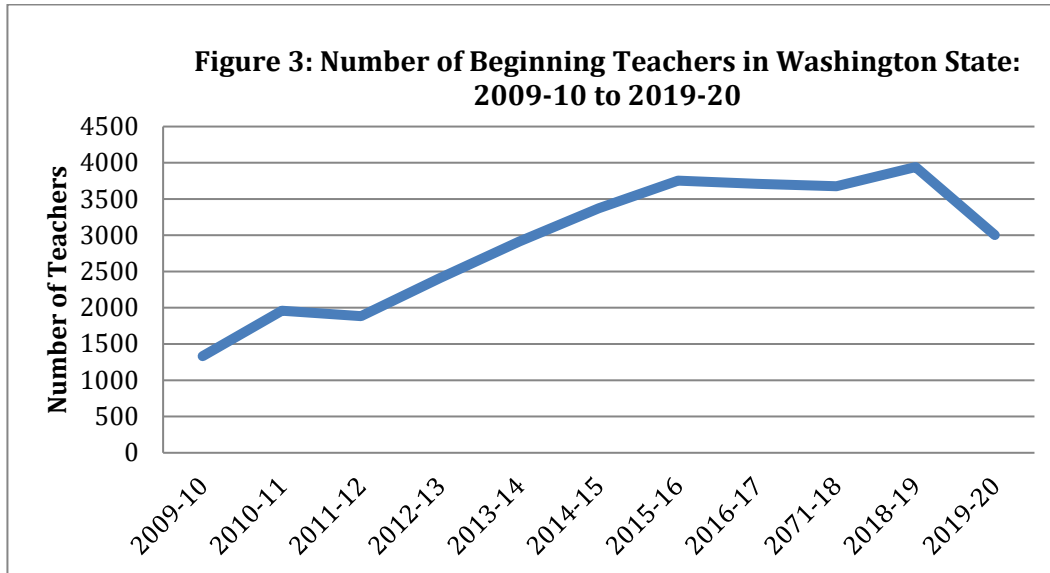
Over the past ten years (from 2010-11 to 2019-20), the percentage of beginning teachers who worked full-time increased from 75% in 2010-11 to 83% in 2019-20, with a range between 72% and 88% over those years. Over the ten years, there is also a decrease in the proportion of beginning teachers who held a master's degree or higher, from 40% in 2010-11 to 32% in 2019-20. Three quarters of beginning teachers are female, a statistic that has changed only slightly over the same ten-year period. As would be expected, on average, the majority of beginning teachers are between the ages of 20 and 30, hovering around 60% over the ten-year period. We find a small increase over time in the proportion of teachers over the age of 40, rising from 15% in 2010-11 to 20% in 2018-19. Table 1 provides details about beginning teacher characteristics.

Table 1: Characteristics of All Beginning* Teachers Statewide from 2010-11 to 2019-20										
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20*
# Teachers (headcount)	1,960	1,883	2,412	2,914	3,372	3,752	3,708	3,676	3,941	3,002
Teacher Gender										
Female	72%	72%	73%	76%	75%	75%	74%	75%	75%	75%
Male	28%	28%	27%	24%	25%	25%	26%	25%	25%	25%
Full-time/Part-time Status										
Full-Time (FTE>=.9)	75%	72%	76%	77%	82%	87%	87%	87%	88%	84%
Not Full-Time (FTE<.9)	25%	28%	25%	23%	18%	13%	13%	13%	12%	16%
Education										
Bachelor and other	57%	54%	54%	59%	61%	61%	61%	63%	62%	60%
Masters and above	40%	42%	43%	38%	36%	36%	36%	33%	33%	32%
Unidentified	3%	4%	3%	2%	3%	3%	3%	3%	5%	7%
Teacher Age in given year										
19-30	66%	60%	63%	62%	64%	62%	60%	60%	58%	NA
31-40	19%	22%	21%	22%	21%	22%	22%	22%	22%	NA
41+	16%	18%	16%	16%	15%	16%	18%	18%	20%	NA
*Teacher Race/Ethnicity**										
Asian/Pacific Islander/Native Hawaiian	4%	4%	4%	4%	4%	3%	5%	4%	5%	5%
Black/African America	1%	2%	1%	1%	2%	2%	2%	2%	3%	3%
Hispanic/Latinx	5%	6%	5%	4%	6%	6%	8%	8%	9%	9%
American Indian/Alaskan Native	0%	1%	1%	1%	0%	1%	1%	1%	1%	1%
White (non-Hispanic)	88%	85%	86%	88%	86%	85%	83%	82%	80%	79%
Multiracial	2%	2%	2%	2%	2%	3%	2%	2%	2%	3%

Duty root 31, 32, 33 or 34 with FTE designation greater than 0; 2019-20s numbers based on preliminary S275 data

Beginning teachers statewide is based on an unduplicated count of teachers with less than one year of experience.

**Individual is considered to be Hispanic if labeled "Y" in "Hispanic" field. If considered Hispanic, individual's other racial/ethnic identities are not considered. Those in remaining non-Hispanic racial/ethnic categories were labeled "N" in "Hispanic" field.

As can be derived from the data in Table 1, the percentage of beginning teachers of color increased from 11.8% to 20.6%. As is the case for all teachers in the state, beginning Hispanic/Latinx teachers have experienced the greatest proportional increase from 2010 to 2019, rising from 5% to 9.2% of all beginning teachers. We also note that the proportion of Black/African American beginning teachers increased from less than 1% to 2.9%, a trend that is different than for all Black/African American teachers statewide. The proportion of White teachers declined from 88% to 79% over the ten-year time period examined. The demographic characteristics of teachers differ dramatically from that of the state's students. During this time period, the statewide percentage of students of color increased from 39% to 47%. Table 2 compares the demographic characteristics of students, all teachers, and beginning teachers for 2019-20.

Table 2: Student and Teacher Race/Ethnicity in 2019-20			
Race/Ethnicity	Students*	All Teachers	Beginning Teachers
American Indian/ Alaskan Native	1.3%	0.7%	0.7%
Asian/Pacific Islander/Native Hawaiian	9.2%	3.2%	4.6%
Black/ African American	4.4%	1.4%	2.9%
Hispanic/ Latinx of any race(s)	24.0%	5.1%	9.2%
Multiracial	8.6%	1.6%	2.9%
White	52.6%	87.9%	79.4%

Student demographic data from the Office of the Superintendent of Public Instruction State Report Card 2019-20

In Section D of this report, we provide a detailed analysis of the distribution, retention and mobility of all teachers of color and beginning teachers of color. We also present statistical models analyzing whether differences exist in the factors associated with the retention and mobility of teachers of color compared to White teachers.

3. Schools and districts where beginning teachers work

We examined the characteristics of the schools and districts where beginning teachers worked during the time period from 2009-10 through 2019-20. In general, approximately half of all beginning teachers in Washington worked in elementary schools. This number increased slightly from 2013-14 to 2017-18, when more than half of all beginning teachers worked in elementary schools (from 51% to 55%). When considering the poverty level of the schools where all beginning teachers worked, we see a gradual shift over time. More than half (52%) of beginning teachers worked in higher poverty schools (50% or more Free or Reduced Price Lunch Program participation) in 2019-20, representing an increase from 41% in 2009-10.

We also see a similar shift when considering the racial/ethnic composition of students. From 2009-10 to 2018-19, the proportion of beginning teachers working in schools where students of color represented more than half of the student body increased from 35% to 48%. Correspondingly, the percentage of beginning teachers working in schools where students of color represented 25% of the student body or less dropped in half, from 31% in 2009-10 to 15% in 2018-19. This change over time also corresponds to the increasing racial and ethnic diversity of students in Washington state.

On average, over the period from 2009-10 to 2019-20, nearly half of all beginning teachers (45%) worked in districts located in the Central Puget Sound (ESD 121). Over the time period examined, there is an increase in the proportion of beginning teachers who worked in districts with student enrollments of 20,000 or more, rising from 29% to 35%. For the past three years examined, there is also an increase in the proportion of beginning teachers working in districts with student enrollments less than 1,000, rising from 6% in 2009-10 to 12% in 2019-20. Appendix B provides details about how beginning teachers are distributed across districts and schools.

4. Characteristics of beginning teachers in BEST districts

When comparing the individual characteristics of all beginning teachers with beginning teachers in BEST districts, we find several similarities and a few differences across the years examined. No notable differences are observed in the proportions of BEST teachers compared to all

beginning teachers with respect to race/ethnicity or age distribution. There also was no consistent pattern of differences between the two groups when examining education level.

In most years examined, there were slightly higher proportions of BEST teachers who were working full-time. On average, across all ten years, 83% of BEST teachers were full-time, compared to 81% of all beginning teachers. For both BEST teachers and all beginning teachers statewide, the proportion of those working full-time has increased in the past five years. And while the percentage of all beginning teachers who were female never dropped below 72%, in two of the years examined (2009-10 and 2011-12) slightly lower proportions of BEST teachers were female (68% and 65% female, respectively). In the most recent years, the percentage of female BEST teachers and all beginning teachers is the same at 75%. See Table 3 below and Appendix C for additional details.

Table 3: Characteristics of Beginning Teachers* in BEST Districts: 2015-16 to 2019-20					
	2015-16	2016-17	2017-18	2018-19	2019-20**
# BEST districts	71	132	163	174	197
# Teachers in BEST districts	2,001	2,593	2,991	3,092	2,526
Teacher Gender					
Female	74%	74%	75%	75%	76%
Male	26%	26%	25%	25%	24%
Full-time/Part-time Status					
Full-Time (FTE= > .9)	88%	88%	87%	88%	84%
Not Full-Time (FTE < .9)	12%	12%	13%	12%	16%
Education					
Bachelor and other	58%	59%	62%	61%	59%
Masters and above	39%	38%	35%	34%	33%
Unidentified	3%	3%	3%	4%	7%
Teacher Age (in given year)					
20-30	63%	61%	60%	59%	NA
31-40	22%	21%	22%	22%	NA
41-50	11%	12%	12%	13%	NA
51-60	4%	4%	5%	5%	NA
61+	0%	1%	1%	1%	NA
Teacher Race/Ethnicity					
Asian/Pacific Islander/Native Hawaiian	4%	5%	4%	5%	5%
Black/African American	2%	2%	2%	3%	3%
Hispanic/Latinx	7%	8%	8%	9%	10%
Native American/Alaskan Native	1%	1%	1%	1%	1%
White (non-Hispanic)	83%	83%	82%	80%	79%
Multiracial	3%	2%	2%	2%	3%

Duty root 31, 32, 33 or 34 with FTE designation >0. Beginning teachers is based on teachers with less than one year of experience.
**Based on preliminary data which does not include some programmed fields.*
Percentages may not add up to exactly 100% due to rounding.

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In selected years, districts that received a BEST grant were asked by OSPI to respond to seven questions about their teacher induction program standards.[4]These questions were developed by OSPI as proxies for determining whether a BEST district was engaging in full-fledged implementation of a teacher induction program. The questions are informed by BEST standards for induction and are provided below:

1. Have you been doing induction work for two or more years?
2. During this time, did you have a stakeholder team?
3. During this time, did you hold an orientation for new teachers during the summer that had at least one day related to instruction?
4. During this time, did you offer on-going professional development for new teachers?
5. During this time, did you send your mentors for training at the Mentor Academy?
6. During this time, did you offer on-going professional development for mentors (roundtables, in-district training, etc.)?
7. During this time, did you have mentors observe new teachers and give them verbal and/or written feedback?

Districts that responded "yes" to all seven questions were identified as having a full-fledged induction program. In other words, districts meeting these criteria are said to have met BEST induction standards. In 2017-18, 67 districts that responded to the survey affirmed they met all seven criteria for BEST induction standards. In 2018-19, that number decreased to 45, but rose to 74 districts in 2019-20. We note that in the three years of data examined, there is a notable proportion of districts with missing data, ranging from 50% to 67%. Consequently, while we can have confidence in the data regarding the districts that responded to the OSPI survey, we cannot know with certainty if there are additional districts meeting the seven criteria among those districts for which data is missing. Appendix D provides details.

B. Retention and Mobility of Beginning Teachers Statewide

In this section, we provide data and statistical analyses regarding the retention and mobility of teachers in Washington state, with a specific emphasis on beginning teachers. We also provide trend data that updates retention and mobility analyses described in prior reports.[5]

We first provide descriptive statistics regarding the retention and mobility rates for all teachers statewide and compare those rates to all beginning teachers. Next we describe the approach to our statistical analyses, predictive models and datasets. Then we present the results from our models which compare retention and mobility outcomes for all teachers in the state, all beginning teachers, and beginning teachers in BEST districts. The focal question for this analysis is: What variables consistently explain teachers' retention and mobility outcomes in Washington state?

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[4] The years for which data regarding implementation status was collected are 2013-14, 2014-15, 2015-16, 2017-18, and 2019-20. Data regarding full-fledged status for 2016-17 was imputed from the available data for 2015-16 and 2017-18.

[5] Elfers, A. M., Plecki, M. L., & Van Windekens, A. (2017). *Understanding Teacher Retention and Mobility in Washington State*. Research commissioned by the Washington State Office of the Superintendent of Public Instruction. Seattle, WA: Center for the Study of Teaching and Policy, University of Washington. Plecki, M. L., Elfers, A. M. & Van Windekens, A. (2017*). Examining Beginning Teacher Retention and Mobility in Washington State.* Research commissioned by the Washington State Office of the Superintendent of Public Instruction. Seattle, WA: Center for the Study of Teaching and Policy, University of Washington.

1. Year by year retention and mobility of all teachers and beginning teachers

When examining data from 2005-06 to 2018-19, we see that, on average, the majority of teachers in Washington state (84%) stay in their school from one year to the next, 7% move within the district, and 2% move out of district. On average, 7% exit the workforce in the subsequent year. These retention and mobility statistics for all teacher are very consistent over time, varying only by 1 or 2 percentage points over the 14-year period examined. Table 4 provides details.

Table 4: Statewide Year by Year Teacher Retention and Mobility Trend Data				
Year by Year	Stayers in School	Movers in District	Movers out District	Exiters from WA system
2005-06 to 2006-07	83%	7%	2%	7%
2006-07 to 2007-08	83%	7%	3%	8%
2007-08 to 2008-09	84%	7%	2%	7%
2008-09 to 200910	85%	8%	1%	6%
2009-10 to 2010-11	86%	7%	1%	6%
2010-11 to 2011-12	85%	7%	1%	7%
2011-12 to 2012-13	85%	7%	2%	6%
2012-13 to 2013-14	85%	6%	2%	7%
2013-14 to 2014-15	82%	7%	3%	7%
2014-15 to 2015-16	83%	6%	4%	7%
2015-16 to 2016-17	83%	6%	4%	7%
2016-17 to 2017-18	84%	6%	3%	7%
2017-18 to 2018-19	83%	6%	4%	7%
2018-19 to 2019-20	85%	6%	3%	7%

We see different results when examining the retention and mobility statistics for beginning teachers as compared to all teachers in the state. Figure 2 summarizes the differences in average retention and mobility rates between beginning teachers and all teachers statewide from 2005-06 to 2018-19. On average, a lower percentage of beginning teachers (72%) stay in their school from one year to the next, and higher percentages move within the district (10%), move out of district (7%), and exit the workforce in the following year (12%), compared to all teachers statewide

Figure 4: Average Retention and Mobility Rates for All Teachers and Beginning Teachers: 2005-06 to 2019-20
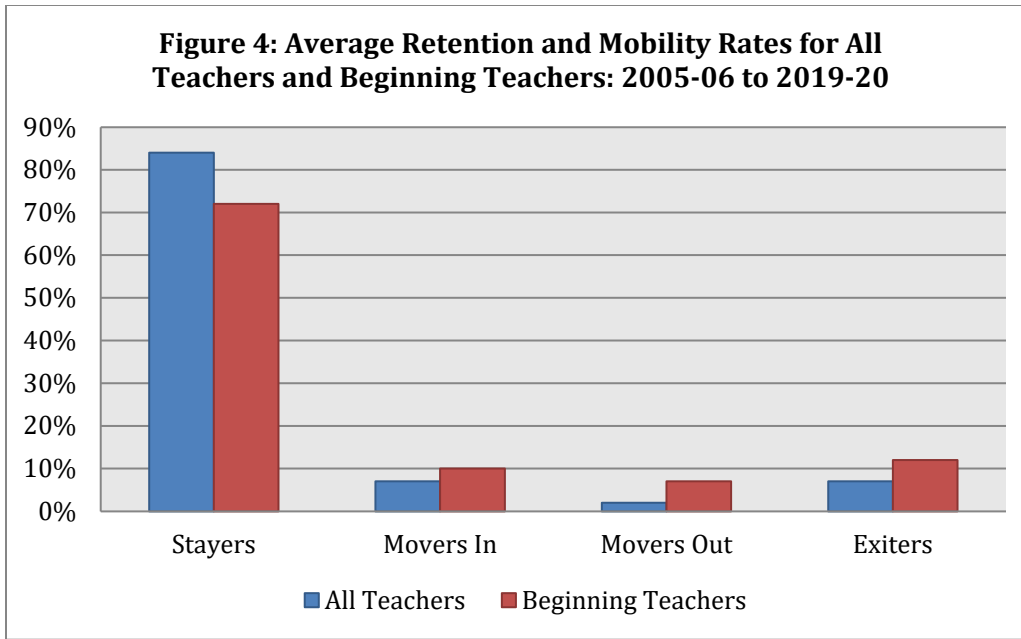
In each of the individual years examined since 2005-06, the yearly retention and mobility rates for beginning teachers are different than from all teachers in the state. Table 5 displays the yearly data for beginning teachers for the time period 2005-06 through 2019-20.

Table 5: Statewide Beginning Teacher Year-by-Year Retention and Mobility Trend Data					
	# Beginning Teachers	Stayers in School	Movers in District	Movers out District	Exiters from WA system
2005/06 to 2006/07	2,841	72%	9%	7%	12%
2006/07 to 2007/08	2,835	70%	10%	7%	14%
2007/08 to 2008/09	2,725	67%	11%	6%	17%
2008/09 to 2009/10	2,460	65%	14%	4%	18%
2009/10 to 2010/11	1,309	68%	14%	7%	11%
2010/11 to 2011/12	1,959	67%	12%	7%	13%
2011/12 to 2012/13	1,883	72%	11%	7%	10%
2012/13 to 2013/14	2,411	76%	8%	7%	8%
2013/14 to 2014/15	2,914	73%	9%	9%	8%
2014/15 to 2015/16	3,372	75%	7%	9%	9%
2015/16 to 2016/17	3,752	76%	7%	8%	9%
2016/17 to 2017/18	3,708	75%	9%	6%	10%
2017/18 to 2018/19	3,676	76%	7%	7%	10%
2018/19 to 2019/20	3,941	72%	10%	5%	13%

2. Five-year retention and mobility of all teachers and beginning teachers

We also analyzed teacher retention and mobility trends for a five-year period. That is, what percentage of teachers who were located in schools in Washington state remained in the same school, moved to another school or district, or exited the Washington state system after 5 years? We first discuss the five-year retention and mobility trend data for all teachers and then present the five-year trends for beginning teachers.

When examining all teachers in the state, we find that some types of five-year retention and mobility trends over time are remarkably consistent, and others vary to a small degree. Table 6 shows the percentages of stayers, movers in district, movers out of district and exiters after five years for 13 different five-year time periods, beginning in 1998-99. We find that the percentage of all teachers who exit the Washington system to be remarkably consistent over time. In eight of the 13 time periods displayed in Table 6, one-fifth (20%) of all teachers exited the Washington system after five year, and that percentage increased to just 21% for four other time periods, with only one time period when the rate of exiters was 19%. The percent of movers in district after five years holds steady at 13% or 14% for 11 of the 13 time periods, with one five-year period having 15% and another with 16% who are movers within the district. For movers out of district after five years, we find a slight increase in the four most recent time periods at either 10% or 11%, compared to a range of 6% to 8% for earlier time periods. We also find a slight decrease in the percentage of all teachers who stay in the same school after five years, with either 55% or 56% staying in the most recent four time periods, while earlier periods see slightly higher percentages, ranging from 57% to 60%. Taken together, the five-year retention and mobility patterns for all teachers in the state have varied in some small ways over the past 17 years. Table 6 below provides specifics.

| | | | | Exiters |
Five-Year Period	Stayers in School	Movers in District	Movers out District	from WA system
Table 6: Statewide Teacher Retention and Mobility				
Five-Year Trend Data				
1998-99 to 2002-03	58%	14%	9%	20%
1999-00 to 2003-04	59%	13%	8%	20%
2000-01 to 2004-05	60%	13%	7%	19%
2001-02 to 2005-06	60%	14%	7%	20%
2002-03 to 2006-07	59%	14%	7%	20%
2003-04 to 2007-08	58%	14%	7%	21%
2005-06 to 2009-10	59%	16%	6%	20%
2010-11 to 2014-15	58%	15%	7%	20%
2011-12 to 2015-16	57%	14%	8%	21%
2012-13 to 2016-17	55%	14%	10%	21%
2013-14 to 2017-18	55%	14%	10%	21%
2014-15 to 2018-19	55%	13%	11%	20%
2015-16 to 2019-20	56%	14%	10%	20%

As is the case when examining year-by-year retention and mobility, five-year trends for beginning teachers vary from those of all teachers in the state. Overall, notably smaller percentages of beginning teachers stay in the same school, and larger percentages move in district, out of district, or exit the Washington state system. On average, over eight time periods examined, 44% of beginning teachers stay in the same school after five years, compared to 58% of all teachers. On average, higher proportions of beginning teachers move within the district (16%) and move out of district (18%) compared to all teachers at 14% and 8%, respectively. Finally, the average percentage of beginning teachers who exit the Washington state system after five years is 22% compared to an average of 20% for all teachers. However, it should be noted that for the most recent time period examined (2015-16 to 2019-20), the percent of beginning teachers who exited the system was 25%. These results are consistent with other studies finding lower retention rates and higher mobility rates for beginning teachers as compared to teachers of all experience levels.

As noted in the previous example, we find we find some differences over time in the percentage of beginning teachers who exit the Washington system after five years. Over the eight time periods examined for beginning teachers, we find that the percentage of exiters ranges from 19% to 26%.The percent of movers in district ranged from 14% to 18% and the percentage of movers out of district ranged from 13% to 21%. Finally, the percent of stayers in the same school ranged from 41% to 47%.While there are some examples of notable variation in retention and mobility results over these eight time periods, we find that less variation in outcomes for the most recent three time periods for stayers, movers in, and movers out. However, for exiters, we

find an increase over the three most recent time periods, from 20% (in 2013-14 to 2017-18) to 25% for 2015-16 to 2019-20. These details can be seen in Table 7 below.

	Total # Teachers Statewide	Total Beginning Teachers	Percent Beginning Teachers	Beginning Stayers in School	Beginning Movers in District	Beginning Movers Out District	Beginning Exiters from WA System
Table 7: Statewide Beginning Teacher Retention Five-Year Trend Data							
5 Year Period							
2003-04 - 2007-08	55,560	2,344	4%	42.3%	17%	14.8%	26%
2005-06 - 2009-10	56,403	2,849	5%	46.7%	16%	12.7%	24%
2010-11 - 2014-15	56,222	1,960	3%	41.3%	18%	18.9%	22%
2011-12 - 2015-16	55,277	1,882	3%	43.7%	17%	18.7%	21%
2012-13 to 2016-17	55,881	2,425	4%	45.3%	15%	20.5%	19%
2013-14 to 2017-18	56,758	2,910	5%	44.1%	15%	21.3%	20%
2014-15 to 2018-19	58,247	3,375	6%	44.2%	14%	19.8%	22%
2015-16 to 2019-20	60,026	3,752	6%	42.7%	14%	18.2%	25%

3. Predictive models examining retention and mobility

In order to test the statistical significance of our descriptive findings, we developed multi-level predictive models that are discussed throughout this section of the report. Our purpose is to understand what factors are associated with retention and mobility outcomes. We begin this analysis by examining all teachers statewide, and then conduct separate analyses for the subset of all beginning teachers. For statewide teachers, the statistical model we finalized is explained below.

Logit (P_{ij}) = γ_{00} + γ_{10} * Employment Status $_{ij}$ + γ_{20} * Teaching Experience (Beginning) $_{ij}$ + γ_{01} * School Poverty $_{ij}$ + γ_{02}* School Grade (Middle) $_{ij}$ +γ_{03} * School Grade (High) $_{ij}$ + γ_{04}* District Size$_{ij}$ + U_{0j} + r_{ij}.

The log-odds of staying/moving-in/moving-out/exiting for teacher *i* in district *j* is modeled as a function of the sum of mean intercept (γ_{00}), the effect of working full-time compared with part-time (γ_{10}), the effect of beginning teachers compared with other teachers who have more than one year of teaching experience (γ_{20}), the effect of each standard deviation increase in school poverty level (%) (γ_{01}), the effect of working in middle school compared with elementary school (γ_{02}), the effect of working in high school compared with elementary school (γ_{03}), the effect of each standard deviation increase in district enrollment (γ_{04}), the deviation between the teacher's district predicted value and the grand mean predicted value (between-district residual, U_{0j}), and the deviation between the teacher's predicted and observed value (within-district residual, r_{ij}).[6]

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[6]We coded our variables as follows: +1 = beginning teacher, -1 = other teachers; +1 = middle school, -1 = elementary school; +1 = high school, -1 = elementary school; +1 = full time, -1 = part-time. To interpret our models easily, all continuous variables (e.g., school poverty, district size) were standardized to z-

To summarize, our model seeks to explore whether or not each of the following factors are associated with a statistically significant difference in our four retention and mobility outcomes for all teachers in the state: (1) full-time status, (2) beginning teacher status, (3) percent of students in the school who are low-income, (4) school level (elementary, middle or high), and (5) district enrollment size. Our model also allows us to calculate the difference in predicted probabilities for factors that are statistically significant.

For beginning teachers, our finalized model varies from the model used for all teachers in two ways because we eliminated the predictor for teaching experience and added predictors for BEST status as described below.

Logit (P_{ij}) = γ_{00} + γ_{10} * Employment Status $_{ij}$ +γ_{01} * School Poverty $_{ij}$ + γ_{02}* School Grade (Middle) $_{ij}$ +γ_{03} * School Grade (High) $_{ij}$ + γ_{04}* District Size$_{ij}$ + γ_{05} * BEST Status$_j$ + U_{0j} + r_{ij}.

The log-odds of staying/moving-in/moving-out/exiting for teacher *i* in district *j* is modeled as a function of the sum of mean intercept (γ_{00}), the effect of doing full-time compared with part-time (γ_{10}), the effect of each standard deviation increase in school poverty level (%) (γ_{01}), the effect of working in middle school compared with elementary school (γ_{02}), the effect of working in high school compared with elementary school (γ_{03}), the effect of each standard deviation increase in district enrollment (γ_{04}), the effect of being a BEST district compared to not (γ_{05}), and the residual errors for districts and teachers in districts (U_{0j} and r_{ij}, respectively).

We note that for two time periods (2015-16 to 2016-17 and 2016-17 to 2017-18), we used only BEST status (whether or not a district was BEST-funded in that year) as a predictor. For the two other time periods (2017-18 to 2018-19 and 2018-19 to 2019-20) we used both BEST status and whether or not a district was identified as having full-fledged implementation as predictors of the BEST program's effect.[7]

Finally, we note that there are differences in sample sizes between the number of teachers who are stayers and the number of teachers who are in the three categories of non-stayers (i.e., movers in, movers out, and exiters). Given these unbalanced sample sizes across categories, we ran two different analyses. First our model compared stayers with all other groups of teachers who are not stayers. Then our model conducts comparisons for all teachers who are not stayers. That is, we compare movers-in with other non-stayers, movers-out with other non-stayers, and exiters with other non-stayers. We use this approach for all teachers and for beginning teachers.

a. Factors associated with retention and mobility for all teachers statewide

We first discuss results from our models that examine retention and mobility for all teachers in the state. We present results for all four years of analyses separately for each category: stayers, movers in, movers out, and exiters.

Stayers

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scores, and all categorical variables (e.g., teacher status, school level, beginning teachers) were effect-coded.

[7] This difference exists because data regarding full-fledged implementation status was not available in some years.

We find that across all four time periods examined, the poverty level of the school, high school status, full-time status, and beginning teacher status are all uniquely predictive of whether a teacher stays in the same school or not.[8] That is, when controlling for all variables in our model, these four factors are statistically significant as predictors. We also find that middle school status is uniquely predictive in three of the four time periods examined. Table 8 details the results for stayers.

Table 8: Summary of Logistic Regression Results: Statewide Stayers vs Non-Stayers

Fixed Effects	2015-2016		2016-2017		2017-2018		2018-2019	
	Coeff	p	Coeff	p	Coeff	p	Coeff	p
School Poverty	-0.17	<.001 ***	-0.12	<.001 ***	-0.17	<.001 ***	-0.17	<.001 ***
District Enrollment	-0.07	.102	-0.08	.103	-0.01	.103	-0.02	.715
Middle School	-0.03	.186	-0.11	<.001 ***	-0.04	<.05 *	-0.14	<.001 ***
High School	0.13	<.001 ***	0.17	<.001 ***	0.19	<.001 ***	0.20	<.001 ***
Full time Status	0.44	<.001 ***	0.40	<.001 ***	0.45	<.001 ***	0.49	<.001 ***
Beginning teacher	-0.19	<.001 ***	-0.23	<.001 ***	-0.17	<.001 ***	-0.38	<.001 ***

Note. N = 54,734 teachers within 248 districts (2015-2016), 55,889 teachers within 247 districts (2016-2017), 57,421 teachers within 253 districts (2017-2018), 57,600 teachers within 248 districts (2018-2019.

* $p < .05$, ** $p < .01$, *** $p < .001$.

From Table 8 we see that full-time status and high school status are positively associated with the likelihood that a teacher will stay in the same school. For example, for 2015-16 to 2016-17, full time teachers had a predicted probability of 83%, but the predicted probability of a part time teacher staying in the same school was only 67%[9]. Thus, the likelihood that a full-time teacher will be a stayer is 16 percentage points higher as compared to a part time teacher, with results for the other three time periods being equal to or very close to results for the 2015-16 to 2016-17 time period. Results for high school teachers are also strong, with predictive probabilities of 78% or 79% for high school teachers staying in the same school, as compared to probabilities of 73% or 74% for elementary teachers. Appendix E contains all results, including the predictive probabilities for stayers across all time periods investigated.

We also find that the level of school poverty is a significant and negative predictor of the likelihood that teachers will be stayers, and these results are significant at the $p < .001$ level for all four time periods. That is, the higher the poverty level, the less likely a teacher would be a stayer, and beginning teachers are less likely to be stayers than teachers who are more experienced. For example, for 2015-16 to 2016-17, teachers who worked at schools with relatively higher poverty levels (+1 standard deviation) had a 73% predicted probability of staying and those who worked at schools with a relatively lower poverty level (-1 standard deviation) had a 79% predicted probability of staying in the same school, reflecting a 6 percentage point difference. Figure 4 shows the differences in predictive probabilities for school poverty across the four time periods, demonstrating that the higher the school poverty, the less likely a teacher will be a stayer.

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[8] Results for all four predictors are significant at $p < .001$.
[9] $b = .44$ ($SE = .05$), $p < .001$

Figure 4: Predicted Probabilities of Stayers by School Poverty Level

Legend: ■ Low School Poverty (-1 SD)   ■ Mean School Poverty   ■ High School Poverty (+1 SD)

Consistent with our prior discussion about retention and mobility for beginning teachers as compared to all teachers in the state, beginning teachers are less likely to remain in the same school after one year. These results are statistically significant and strong across all four time periods at the p < .001 level. For 2018-19 to 2019-20, the predicted probability that a beginning teacher would be a stayer was 67%, compared to 81% for teachers who are not beginners, a 14-percentage point difference. In other time periods examined, the predicted probabilities are somewhat lower, ranging from 6 to 9 percentage points lower for beginning teachers as compared to teachers with more than one year of experience. District enrollment size was not a significant predictor of stayers for any time period.

Movers In

Results for movers in district vary considerably from those for stayers. District enrollment size and high school status are the strongest predictors of movers in district, as these factors are statistically significant across all four time periods and are significant at the p < .001 level in all but one case. Table 9 summarizes results and Appendix F contains additional details.

Table 9: Summary of Logistic Regression Results: Statewide Movers-In vs Other Non-Stayers

Fixed Effects	2015-2016		2016-2017		2017-2018		2018-2019	
	Coeff	p	Coeff	p	Coeff	p	Coeff	p
School Poverty	0.06	.084	0.02	.550	0.09	<.01 **	-0.03	.459
District Enrollment	0.27	<.001 ***	0.32	<.001 ***	0.33	<.001 ***	0.29	<.01 **
Middle School)	0.06	.117	0.17	<.001 ***	-0.01	.893	0.08	<.05 *
High School)	-0.32	<.001 ***	-0.24	<.001 ***	-0.29	<.001 ***	-0.32	<.001 ***
Full time Status	0.09	<.05 *	0.11	<.01 **	0.07	.051	0.20	<.001 ***
Beginning Teacher	-0.13	<.01 **	-0.01	.724	-0.12	<.01 **	-0.03	.397

Note. N = 9043 teachers within 229 districts (2015-2016), 9245 teachers within 231 districts (2016-2017), 9632 teachers within 242 districts (2017-2018), 8621 teachers within 230 districts (2018-2019).

* p < .05, ** p < .01, *** p < .001.

As compared to elementary school teachers, high school teachers are less likely to move within the district and the differences in the predictive probabilities for these two groups are notable for all four time periods. For example, for 2016-17 to 2017-18, the predicted probability for high school teachers to move in district was 29%, compared to 36% for elementary teachers. District enrollment size is also a statistically significant predictor of movers in district.[10] That is, the larger the district, the more likely that a teacher will move within the district. As an example of the size of this relationship, the predicted probability of a teacher in a larger district being a mover in is 42% (for 2016-17 to 2017-18) compared to 29% for a teacher in a smaller district.[11] This is as expected, since larger districts are more likely to have more schools and more opportunities for teachers to move within the district.

As can be seen in Table 9, middle school status, full-time status, and beginning teacher status are also statistically significant predictors, but results across the four time periods are inconsistent and the significance level for these predictors are not as strong in most cases as compared to high school status and district enrollment size. Finally, we note that school poverty level is not a significant predictor in any of the time periods.

Movers out

Full-time status, school poverty, district enrollment, and beginning teacher status all appear as unique predictors of movers out of district in either all or most time periods examined. Full-time status is the strongest predictor, with $p < .001$ across all time periods. The difference in predictive probabilities for teachers who are full-time compared to part-time teachers ranges from 7 to 13 percentage points. For example, for 2017-18 to 2018-19, the predictive probability of a full-time teacher moving out of district is 27% compared to 14% for part-time teachers.[12] As is the case for movers in, district enrollment is uniquely and negatively predictive of whether a teacher will move out of district or not. That is, teachers in larger districts are less likely to move out than teachers in smaller districts. As in the case of movers in, this is also to be expected as larger districts have more schools and more opportunities for teachers to move within the district rather than seeking a change of schools outside the district. Table 10 provides details.

Table 10: Summary of Logistic Regression Results: Statewide Movers-Out vs Other Non-Stayers

Fixed Effects	2015-2016		2016-2017		2017-2018		2018-2019	
	Coeff	p	Coeff	p	Coeff	p	Coeff	p
School Poverty	0.08	<.05 *	0.10	<.01 **	0.13	<.001 ***	0.05	.233
District Enrollment	-0.23	<.01 **	-0.27	<.001 ***	-0.22	<.01 **	-0.19	<.01 **
Middle School)	0.02	.667	-0.05	.295	0.04	.359	0.02	.699
High School)	0.10	<.05 *	0.08	.061	0.11	<.05 *	0.19	<.001 ***
Full time Status	0.30	<.001 ***	0.31	<.001 ***	0.39	<.001 ***	0.28	<.001 ***
Beginning Teacher	0.29	<.001 ***	0.05	.286	0.20	<.001 ***	0.09	<.05 *

Note. N = 9,043 teachers within 229 districts (2015-2016), 9245 teachers within 231 districts (2016-2017), 9632 teachers within 242 districts (2017-2018), 8621 teachers within 230 districts (2018-2019).

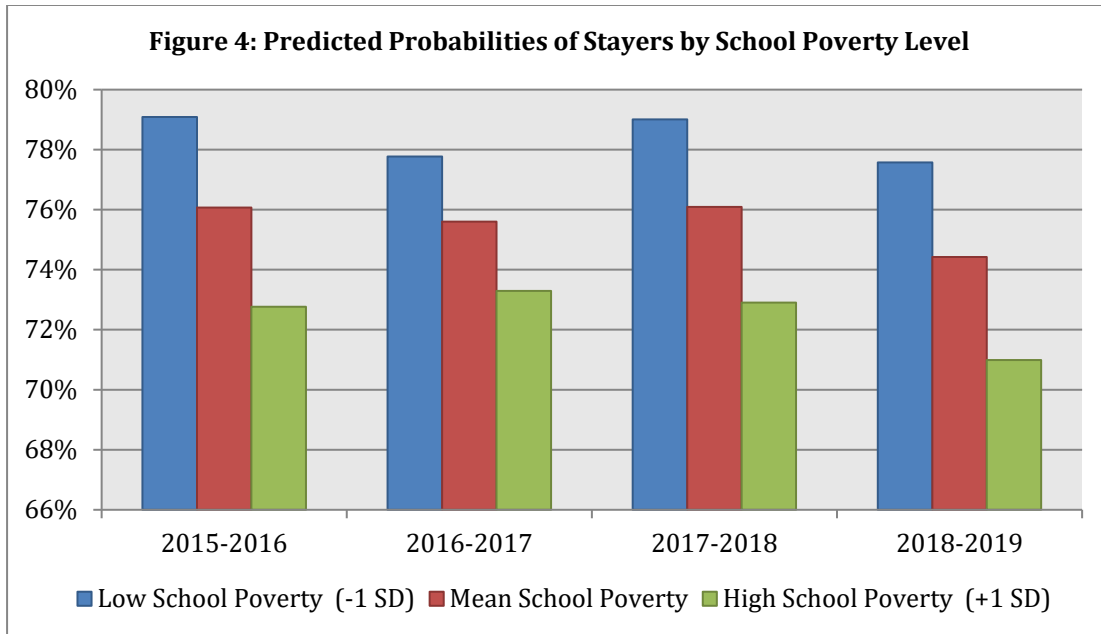** p < .05, ** p < .01, *** p < .001.*

For three of the four time periods, beginning teacher status is also a unique predictor of movers out at a $p < .001$ level. For 2015-16 to 2016-17, the predicted probability of a beginning teacher

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[10] p < .001 for all time periods except for 2018-19 to 2019-20 when p < .01.
[11] A complete table of results, including predicted probabilities for movers in, can be found in Appendix F.
[12] A complete table of results, including predicted probabilities for movers out, can be found in Appendix G.

moving out of district is 27% compared to 17% for teachers who are not in their first year of teaching. School poverty and high school status are also statistically significant predictors in 3 of the four time periods, but only at the p < .001 level for one of those years. Differences in predictive probabilities for school poverty range from 2 to 4 percentage points and range from 4 to 5 percentage points for high school status for the three time periods.

Exiters

When examining unique predictors for teachers who exit the Washington state system, we find that for all four time periods, high school status and full-time status were strong significant predictors.[13] Results for full-time status are particularly notable, as the differences in predicted probabilities are large. In the most recent period (2018-19 to 2019-20), the predicted probability of a full-time teacher exiting is 42%, compared to 58% for part-time teachers, a difference of 16 percentage points. This large difference is also the case for the three other time periods, ranging between 13-14 percentage points between full-time and part-time teachers. School poverty was a strong and negative predictor (<.001) for two of the time periods (2015-16 and 2017-18) and significant but less strong predictor (<.05) in one period (2016-17). Details are provided in Table 11 below and in Appendix H.

Table 11: Summary of Logistic Regression Results: Statewide Exiters vs Other Non-Stayers

Fixed Effects	2015-2016		2016-2017		2017-2018		2018-2019	
	Coeff	p	Coeff	p	Coeff	p	Coeff	p
School Poverty	-0.10	<.001 ***	-0.06	<.05 *	-0.18	<.001 ***	-0.01	.793
District Enrollment	-0.02	.653	-0.06	.253	-0.10	.062	-0.10	.153
Middle School	-0.06	.128	-0.13	<.001 ***	-0.01	.821	-0.07	.062
High School	0.21	<.001 ***	0.17	<.001 ***	0.18	<.001 ***	0.18	<.001 ***
Full time Status	-0.26	<.001 ***	-0.28	<.001 ***	-0.29	<.001 ***	-0.32	<.001 ***
Beginning Teacher	-0.12	<.01 **	-0.02	.618	-0.05	.181	-0.02	.514

Note. N = 9043 teachers within 229 districts (2015-2016), 9245 teachers within 231 districts (2016-2017), 9632 teachers within 242 districts (2017-2018), 8621 teachers within 230 districts (2018-2019).
* p < .05, ** p < .01, *** p < .001.

Summary of results for all teachers statewide

Results of our models for all teachers in the state, indicate that four factors are consistently predictive of the likelihood that teachers will stay in the same school across the four time periods. These four factors are (1) school poverty level, (2) high school level, (3) full-time status, and (4) whether a teacher has less than one year of teaching experience. Each of these factors is highly significant (p < .001) and present in all four time periods examined. For movers in district, the strongest predictors are district enrollment size and high school status. These factors are statistically significant across all four time periods at the p < .001 level in all but one case.

For movers out of district, full-time status, school poverty, district enrollment and beginning teacher status are significant predictors in either all or most of the time periods. As was the case for movers in, district enrollment is uniquely and negatively predictive of whether a teacher will move out of district or not. For three of the four time periods, beginning teacher status is also a unique predictor of movers out at a p < .001 level. Significant predictors for statewide exiters are

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[13] p < .001 in all cases for both predictors

high school status and full-time status, with predicted probabilities particularly large for full-time status. School poverty is also a significant predictor in three of the four time periods examined.

b. Factors associated with retention and mobility for beginning teachers

As was the case in our discussion of results from the multilevel models for all teachers statewide, we organize our presentation of results for beginning teachers separately for each retention and mobility category. As previously mentioned, our model for beginning teachers includes predictors regarding BEST status and removes the predictor for years of teaching experience.

Beginning stayers

Results for beginning teachers differ somewhat from the results discussed above regarding predictors of teachers who are stayers. For example, as shown in the prior Figure 4, for all teachers in the state, school poverty was a strong and negative predictor for teachers who stay in the same school. In contrast, for beginning teachers, poverty was only predictive for 2018-19, but with a relatively weak significance level ($p < .05$).

As is the case for all teachers, full-time status and school level are also unique predictors of stayers for beginning teachers. Full-time status is strongly and positively associated with stayers in three of the four time periods,[14] with large differences in the predictive probabilities. For example, for 2017-18 to 2018-19, the predicted probability of full-time teachers who are stayers is 79%, compared to just 58% for part-time teachers, and similar differences exist for the two other time periods. Table 12 displays results.[15]

Table 12: Summary of Logistic Regression Results: Beginning Stayers vs Non-Stayers

Fixed Effects	2015-2016		2016-2017		2017-2018		2018-2019	
	Coeff	p	Coeff	p	Coeff	p	Coeff	p
School Poverty	-0.09	.076	0.01	.777	-0.09	.063	-0.12	.023 *
Middle School	-0.12	.093	-0.13	.082	-0.21	.004 **	-0.11	.112
High School	0.23	.002 **	0.18	.009 **	0.15	.040 *	0.17	.012 *
Full time Status	0.50	<.001 ***	0.38	<.001 ***	0.49	<.001 ***	0.52	<.001 ***
District Enrollment	0.03	.623	-0.05	.438	0.07	.243	-0.10	.339
BEST District	-0.04	.427	-0.04	.512	-0.04	.418	0.02	.821

Notes. N = 3432 teachers within 200 districts (2015-16), 3360 teachers within 197 districts (2016-17), N = 3334 teachers within 214 districts (2017-18), N = 3468 teachers within 208 districts.
* $p < .05$, ** $p < .01$, *** $p < .001$.

We can see in Table 12 that high school status is also a unique predictor of beginning teachers who are stayers for all four of the time periods, but with varying significance levels ($p < .001$ for one period; $p < .01$ for two periods; $p < .05$ for one period). In each case, high school teachers are more likely to stay in the same school as compared to elementary teachers. We note that BEST status (including whether a BEST district is considered to be full-fledged) is not a unique predictor of stayers for beginning teachers.

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[14] $p < .001$

[15] A complete table of results, including predicted probabilities for beginning teachers and stayers, can be found in Appendix I.

Beginning movers in

Similar to the results for all teachers statewide, district enrollment size is a unique predictor for movers within district for all four time periods (p < .05 for two periods and p < .10 for two periods). That is, teachers in larger districts are more likely to move within district than teachers in smaller districts and there are large differences in the predicted probabilities (See Table 13). For instance, for 2017-18 to 2018-19, teachers who worked in schools with larger enrollment have a predicted probability of 38% for moving within district, compared to a predicted probability of 24% for teachers in smaller districts, reflecting a 14 percentage point difference. The percentage point difference in predicted probabilities for the three other time periods range from 11 to 17 points. Appendix J contains detailed results, including all predictive probabilities for movers in.

Table 13: Summary of Logistic Regression Results: Beginning Movers-In vs Other Non-Stayers

Fixed Effects	2015-2016		2016-2017		2017-2018		2018-2019	
	Coeff	*p*	*Coeff*	*p*	*Coeff*	*p*	*Coeff*	*p*
School Poverty	-0.11	.260	-0.05	.639	<.001	.965	-0.08	.338
Middle School	0.06	.690	0.10	.443	-0.15	.254	0.12	.307
High School	-0.51	.001 **	-0.21	.121	0.03	.798	-0.35	.004 **
Full time Status	-0.21	.048 *	-0.11	.282	-0.05	.625	0.25	.011 *
District Enrollment	0.27	.029 *	0.27	.045 *	0.33	.004 **	0.40	.006 **
BEST District	0.04	.754	-0.05	.679	-0.02	.831	-0.09	.445

Notes. N = 816 teachers within 142 districts (2015-16), 832 teachers within 145 districts (2016-17), 791 teachers within 152 districts (2017-18); 971 teachers within 146 districts (2018-19).
* p < .05, ** p < .01, *** p < .001.

We can see from Table 13 that high school status is a unique predictor for movers in district for both the earliest and latest time periods examined, and this relationship is negative. That is, high school teachers are less likely to move in district as compared to elementary teachers. This is likely due to the fact that, generally speaking, there are fewer high schools in a district and more elementary schools. While full-time status appears as a unique predictor for movers in, this result appears in only two years at the lowest significance level (p < .05). As is the case for stayers, school poverty and BEST status (including whether a BEST district is considered to be full-fledged) are not unique predictors for movers in district for beginning teachers.

Beginning movers out

For beginning teachers who move out of district compared to other beginning teachers who do not remain in their same school, district size is a significant predictor for all four time periods. Though the levels of significance vary (with p values ranging from <.05 to <.001), predicted probabilities are large (varying 8 to 15 percentage points over the 4 time periods). For example, for 2017-18 to 2018-19, the predicted probability of teacher in a larger district moving out of district is 17%, which is nearly half of the predicted probability for a teacher in a small district (31%).

Full-time status is statistically significant for three of the four time periods (though none at are p < .001 level) and predicted probabilities are large (8 to 12 percentage point difference). For the most recent time period, as compared to elementary school teachers, high school teachers are less likely to move out of the district. In the most recent time period, the predicted probability of a high school teacher moving out of district is 13% compared to 23% for elementary teachers. However, high school status is not a unique predictor in the other three time periods examined.

BEST status is not a predictor for movers out of district in any of the time periods examined. More information on beginning teachers who move out of district can be found in Table 14 and Appendix K.

Table 14: Summary of Logistic Regression Results: Beginning Movers-Out vs Other Non-Stayers

Fixed Effects	2015-2016		2016-2017		2017-2018		2018-2019	
	Coeff	p	Coeff	p	Coeff	p	Coeff	p
School Poverty	0.09	.314	-0.10	.372	-0.07	.478	-0.06	.505
Middle School	0.15	.287	<.001	.978	-0.02	.909	0.14	.289
High School	-0.02	.862	0.03	.861	-0.05	.752	0.27	.044 *
Full time Status	0.31	.004 **	0.29	.029 *	0.34	.004 **	0.04	.721
District Enrollment	-0.37	<.001 ***	-0.29	.027 *	-0.42	.001 **	-0.37	.006 **
BEST District	0.04	.698	-0.01	.910	0.10	.361	0.04	.739

Note. N = 816 teachers within 142 districts (2015-16), 832 teachers within 145 districts (2016-17), 791 teachers within 152 districts (2017-18), 971 teachers within 146 districts (2018-19).
* p < .05, ** p < .01, *** p < .001.

Beginning exiters

When examining unique predictors for beginning teachers who exit the Washington state system, we find few conclusive results. Full-time status is significant in only two time periods at p < .01 and p < .05. High school compared to elementary school teacher status is only significant for the 2015-16 year and only at a p < .01 level. Table 15 below and Appendix L contain detailed results, including predicted probabilities for beginning exiters.

Table 15: Summary of Logistic Regression Results: Beginning Exiters vs Other Non-Stayers

Fixed Effects	2015-2016		2016-2017		2017-2018		2018-2019	
	Coeff	p	Coeff	p	Coeff	p	Coeff	p
School Poverty	-0.02	.819	0.12	.163	0.08	.325	0.12	.144
Middle School	-0.13	.318	-0.09	.472	0.15	.223	-0.19	.103
High School	0.40	.001 **	0.18	.151	0.01	.963	0.13	.254
Full time Status	-0.10	.279	-0.06	.540	-0.21	.029 *	-0.27	.003 **
District Enrollment	0.15	.063	0.00	.989	0.04	.676	-0.19	.163
BEST District	-0.05	.537	0.06	.518	-0.05	.559	0.09	.419

Notes. N = 816 teachers within 142 districts (2015-16), 832 teachers within 145 districts (2016-17), 791 teachers within 152 districts (2017-18), 971 teachers within 146 districts (2018-19).
* p < .05, ** p < .01, *** p < .001.

Summary of results for beginning teachers

For beginning teachers, full-time status and school level are unique predictors for stayers, but unlike teachers statewide, poverty is not associated with staying in the same school as strongly (only one time period, and at a lower level of significance). Full-time status was strongly and positively associated with staying in the same school with large differences in the predictive probabilities. Working at the high school level compared to an elementary school is also a unique predictor of beginning teachers who are stayers for all four time periods, but with varying significance levels. BEST status (including whether a BEST district is considered to be full-fledged) is not a unique predictor of stayers for beginning teachers in any of the four time periods examined.

Beginning teachers in larger districts are more likely to move within district than teachers in smaller districts, compared to other beginning teachers who do not remain in their same school, and there are large differences in these predicted probabilities. High school teachers are less

likely to move in district as compared to elementary teachers in both the earliest and latest time periods examined. For beginning teachers who move out of district, significant predictors include district size, and full-time status. District size is a significant predictor across all four time periods and while levels of significance vary, predicted probabilities are large across these time periods. For beginning exiters, while full-time status and high school level are significant predictors in some years, significance levels are lower and findings are not consistent across these years. Similar to beginning stayers, BEST status (including whether a BEST district is considered to be full-fledged) is not a unique predictor for any retention or mobility outcomes.

It should be noted that the predictive models in this study have both similarities and differences in results as compared to our prior research on beginning teachers and the BEST program.[16] Similarities exist for factors such as full-time status of teachers, high school level, district size and school poverty. This study confirms results from our prior study that beginning teachers who are full-time are more likely to stay, and less likely to move or exit than part-time beginning teachers. This study also confirms results that beginning teachers in districts with larger student enrollments are less likely to move out of district than beginning teachers in smaller sized districts. Finally, both studies confirm that school poverty is not a strong significant predictor for retention and mobility outcomes for beginning teachers, with only one significant effect in 2018-2019 to 2019-2020 of all the years across the two studies.

Findings from this study vary somewhat from our prior work regarding participation in the BEST program, and full-fledged implementation status. In our prior study, we did find some instances in some years in which participation in the BEST program was associated with a lower rate of beginning teachers exiting the Washington state system. Additionally, in our prior study, for one time period examined for which data about full-fledged implementation was available (2014-15 to 2015-16), we found that in our sample of 14 districts, full-fledged status was predictive of a lower exiter rate for beginning teachers. These two studies examined different time periods, and that could likely account for some of the variation in these results. Arguably, the most notable difference is in the number of districts and the number of beginning teachers served by the BEST program in recent years. For example, in 2019-20, 84% of all beginning teachers in the state were located in the 197 BEST-funded districts, while in 2014-15 (the year examined in the prior study for full-fledged implementation) only 32% of teachers were located in the 36 BEST-funded districts. While the dramatic increase in participation rates in the BEST program is certainly a positive policy outcome, it becomes more problematic in more recent years to discern differences in the impact that the BEST program has compared to the steadily decreasing number of districts who do not receive BEST funding. Another likely factor impacting results is the significant amount of missing data regarding districts meeting the seven criteria for BEST induction standards.[17]

C. Mentoring Models in BEST Districts

Districts receiving BEST funding make decisions regarding how to design and implement supports for beginning teachers. One of the decisions concerns the type of approach to mentoring. OSPI has identified two types of mentoring models: colleague mentor and released mentor. As mentioned previously, colleague mentors are experienced educators who mentor in addition to their teaching or other responsibilities. For colleague mentors, the maximum ratio is two new teachers per one colleague mentor. In this model, the expectation is that colleague mentors will observe their new teacher(s) at least quarterly.

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[16] See footnote 5.
[17] See prior discussion on page 15 and Appendix D for details about missing data.

A released mentor is the other type of mentoring model. Released mentors are experienced educators who are released from teaching or other responsibilities to allow dedicated, weekly time for mentoring. Released mentors can have either full-time or part-time mentoring responsibilities. The maximum ratio for released mentors with no other responsibilities is 20 new teachers per one mentor. Released mentors are expected to observe each new teacher at least eight times per year. Instructional coaches and other teachers on special assignment (TOSAs) may serve as released mentors if mentoring is considered part of their assignment and if their position designates sufficient time to prioritize work with new teachers. For example, an instructional coach assigned to four beginning teachers would need to have the equivalent of one day of time per week allotted for the mentoring of these beginning teachers.

In this section, we provide a preliminary review of available data about mentor models used by districts who received BEST funding in the years 2016-17 through 2019-20. It is important to note that data about mentor models is not available for all BEST-funded districts, and no mentor model data is available for districts in the state who did not receive BEST funding. While data about mentor models is limited, it is possible to conduct a preliminary examination to obtain some insights into possible patterns which may exist with respect to variation across districts regarding mentor model used.

Using available data from 2016-17 to 2019-20, we find some general patterns regarding the characteristics of districts using a released mentor model compared to those reporting use of a colleague model. When examining choice of mentor model by district enrollment size, we find notable differences. A much higher proportion of larger districts use a released mentor model as compared to smaller districts. As can be seen in Table 16, the majority of districts with enrollments of 10,000 students or more use the released mentor model. Use of the released mentor model is even higher in districts with enrollments of at least 20,000 students, ranging from 57% to 92% over the four years examined. Conversely, we find that the overwhelming majority of districts with student enrollments below 1,000 use the colleague mentor model, ranging from 71% to 85% over this four-year period.

We also find differences when examining choice of mentor model by region of the state. Higher proportions of districts in the Central Puget Sound (ESD 121) use the released mentor model, likely due to the fact that a majority of the state's largest districts are located in ESD 121. The colleague mentor model is more prevalent in districts located in Eastern Washington (ESDs 101, 105, 123 and 171). We note that a larger proportion of small districts are located in Eastern Washington as compared to districts in ESD 121. Somewhat equal proportions of districts located in Western Washington outside the Central Puget Sound (ESDs 112, 113, 114, and 198) use the released and colleague mentor models.

The data about use of mentor models also demonstrates that some districts use both types of mentor model. We find that relatively higher proportions of districts with larger student enrollments (10,000 students or more) use both mentor models as compared to districts serving fewer students (4,999 students or less). We also find districts serving 5,000-9,999 students have a more even distribution across types of models used (released, colleague, and both) compared to districts in other size categories. Table 16 provides details about type of mentor model by district size and regional location.

Table 16: Characteristics of Districts by Type of Mentor Model											
	2016-17			2017-18			2018-19			2019-20		
	Released	Colleague	Both	Released	Colleague	Both	Released	Colleague	Both	Released	Colleague	Both
Number of Districts	28	50	9	51	53	19	60	65	19	50	70	26
District Student Enrollment												
Fewer than 999	11%	85%	4%	26%	71%	3%	26%	74%	2%	16%	76%	9%
1,000-4,999	30%	63%	7%	42%	50%	8%	42%	49%	9%	38%	48%	14%
5,000-9,999	50%	30%	20%	41%	24%	35%	22%	33%	44%	35%	35%	29%
10,000-19,999	54%	31%	15%	53%	13%	33%	65%	12%	24%	56%	0%	44%
20,000+	57%	14%	29%	70%	0%	30%	92%	0%	8%	62%	15%	23%
Region of the State												
Central Puget Sound (ESD 121)	57%	21%	21%	58%	21%	21%	71%	19%	10%	48%	33%	19%
Western WA (outside ESD 121)	40%	49%	11%	43%	45%	12%	46%	41%	13%	37%	44%	19%
Eastern WA	16%	81%	5%	33%	50%	17%	25%	60%	15%	21%	63%	16%

Some districts receiving BEST funds have chosen to belong to consortia that are supported by Educational Service Districts (ESDs). Often these are districts with lower student enrollment and districts located in more sparsely populated areas of the state. When comparing districts who are part of a BEST consortia to those that are not, we find that in three of the four years examined,[18] a higher percentage of districts in consortia utilize the colleague mentor model, and a lower percentage use a combination of the two models. The largest difference is seen in 2016-17, when more than three-quarters (76%) of districts in a BEST consortia used a colleague mentor model, compared to only 30% of districts not associated with a consortia.

Higher proportions of districts that are not part of a consortia use both types of mentor models compared to districts that are in a BEST consortia. The percentage of districts who are not part of a consortia that use both mentor models range from 15% to 31%, compared to a range of 5% to 8% of districts that are in a BEST consortia. It should be noted that these descriptive results are likely related to the differences in size between districts within a consortia and those not in a consortia. Appendix M contains details the comparisons between districts that are part of a BEST consortia and those which are not.

We included mentor model type in our initial statistical analyses and predictive models, but we found that mentor type was not associated with any statistically significant differences in retention and mobility outcomes.

D. Teachers of Color in Washington State

As discussed earlier in this report, the percentage of beginning teachers of color has increased over time, with the largest increases seen for beginning Hispanic/Latinx teachers. However, the racial/ethnic composition of the beginning teacher workforce differs dramatically from that of the state's students, with beginning teachers of color representing 20.6% of the workforce while 46.4% of the state's students are people of color. In this section, we provide details about the characteristics and distribution of all teachers of color statewide and beginning teachers of color across districts and schools, and examine their retention and mobility rates. We describe differences between beginning teachers of color and White teachers, and also explore differences among teachers of color in BEST-funded districts and those in BEST districts with

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[18] We note that in two of the years examined, there was a sizable proportion of districts in consortia (15% in 2017-18 and 10% in 2019-20) for which data about type of mentor model is not available.

full-fledged induction programs. We also provide analyses specific to particular racial and ethnic groups.

1. Characteristics of teachers of color

When examining individual characteristics of teachers of color in the state, we find that Hispanic/Latinx teachers comprised just 9.2% of the beginning teacher workforce in 2019-20 (an increase from 5% in 2010-11) while the percent of Hispanic/Latinx students in the state was 24% in this same year (see Tables 1 and 2).That said, Hispanic/Latinx teachers represent the largest proportion of all teachers of color and also have the largest growth rates over time. In 2019-20, Hispanic/Latinx beginning teachers represented close to half (45.4%) of all beginning teachers of color. Teachers who are Native American or Alaskan Native represent the smallest proportion of teachers of color, representing 5.7% of all teachers of color and 3.3% of all beginning teachers of color in 2019-20 (see Appendix N).

When comparing all teachers of color with beginning teachers of color we find differences among racial and ethnic groups. For example, the percentage of beginning Hispanic/Latinx teachers in the state is consistently higher than for all Hispanic/Latinx teachers across all five years of data (2015-16 to 2019-20). However, for Asian/Pacific Islander/Native Hawaiian teachers, the proportion of beginning teachers is consistently lower than for all teachers in this group. For example, in 2019-20, all Asian/Pacific Islander/Native Hawaiian teachers comprised 26.8% of all teachers of color but only 22.8% of all beginning teachers of color. For Black and African American teachers, the percent of beginning teachers was lower than for all Black and African American teachers in the years 2015-16 and 2016-17, but this pattern changed in subsequent years. In 2019-20, Black and African American teachers represented 11.9% of all teachers of color, and 14.1% of all beginning teachers of color. Figure 5 depicts data for all teachers of color and beginning teachers of color by racial/ethnic group for 2019-20. Appendix N provides additional details for the years 2015-16 through 2019-20.

Figure 5: All Teachers of Color and Beginning Teachers of Color by Racial/Ethnic Group: 2019-20
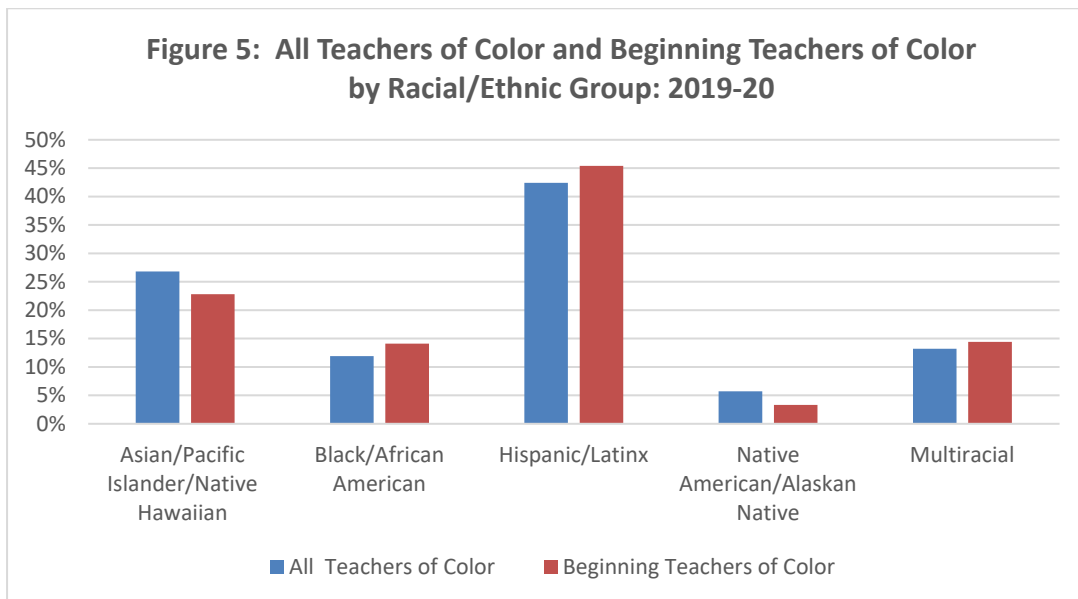
Differences also exist among specific racial and ethnic groups of teachers with respect to their regional location in the state. The majority of Black/African American teachers and the majority of Asian/Pacific Islander/Native Hawaiian teachers are located in the Central Puget Sound

region (ESD 121) (see Table 17). On average, over the five years examined (2015-16 to 2019-20), 72% of all Black/African American teachers and 73% of all Black/African American beginning teachers are located in the Central Puget Sound region. Also, on average, 67% of all teachers and 74% of beginning teachers who are Asian/Pacific Islander/Native Hawaiian work in the Central Puget Sound region. The majority of all teachers and beginning teachers who identify as Multiracial (more than one race) are also located in the Central Puget Sound region. There is a steady rise in the percent of Multiracial teachers in the Central Puget Sound, increasing from 54% of all Multiracial teachers and 56% of beginning Multiracial teachers in 2015-16, to 59% of all Multiracial teachers and 72% of beginning Multiracial teachers in 2019-20.

While the majority of teachers of color from some racial and ethnic groups are located in the Central Puget Sound region, nearly half of all Hispanic/Latinx teachers are located in Eastern Washington. On average over the five-year period, 48% of all Hispanic/Latinx teachers and 47% of beginning teachers who are Hispanic/Latinx work in Eastern Washington. Native American/Alaskan Native teachers are more evenly distributed across the three geographic regions of the state. Table 17 displays information about the five-year average percentage of teachers of color by region for each racial and ethnic group.

Table 17: Distribution of Teachers of Color by Region: Average Percentages from 2015-16 to 2019-20			
Teachers of Color	Central Puget Sounds (ESD 121)	Western WA (outside 121)	Eastern WA
Asian/Pacific Islander/Native Hawaiian			
Statewide	66.9%	24.0%	9.0%
Beginning	73.7%	20.6%	5.7%
Black/African American			
Statewide	72.1%	17.9%	10.0%
Beginning	73.1%	15.9%	11.0%
Hispanic/Latinx			
Statewide	32.8%	19.1%	48.1%
Beginning	34.3%	18.5%	47.2%
Native American/Alaskan Native			
Statewide	32.0%	38.7%	29.3%
Beginning	33.4%	36.8%	29.8%
Multiracial			
Statewide	56.9%	28.8%	14.3%
Beginning	63.2%	26.6%	10.2%

2. Distribution of teachers of color across schools and districts

When examining differences in the distribution of beginning teachers of color across a variety of school characteristics, we find no notable differences in the proportion of beginning teachers of color working in elementary, middle and high schools as compared to all beginning teachers for

the time period from 2015-16 to 2019-20. Additionally, there are no large differences in the distribution of beginning teachers of color across district enrollment size categories as compared to all beginning teachers of color. However, there are large differences when examining the distribution of teachers of color across schools serving varying proportions of students of color and students who are low-income.

For each of the years examined (2015-16 to 2018-19), higher proportions of beginning teachers of color are located in schools where the percent of students of color is 75% or more. Conversely, lower proportions of teachers of color are located in schools where the percent of students of color is 25% or less. For example, as can be seen in Table 18, in 2018-19, the percent of all beginning teachers located in schools where the percent of students of color is 75% or more is 21% compared to 37% of beginning teachers of color who are located in these same schools. In schools where the percent of students of color is 25% or less, the inverse relationship is true with 15% of all beginning teachers in these schools compared to only 6% of beginning teachers of color.

Table 18: Beginning Teachers of Color and All Beginning Teachers by School Poverty and Percent Students of Color: 2015-16 to 2019-20										
	2015-16		2016-17		2017-18		2018/19		2019/20*	
	Beginning Teachers of Color	All Beginning Teachers	Beginning Teachers of Color	All Beginning Teachers	Beginning Teachers of Color	All Beginning Teachers	Beginning Teachers of Color	All Beginning Teachers	Beginning Teachers of Color	All Beginning Teachers
*Poverty of School***										
0-25% FRPL	14%	19%	16%	20%	15%	20%	14%	18%	14%	19%
26-49% FRPL	22%	30%	18%	28%	23%	31%	22%	27%	21%	27%
50-74% FRPL	32%	29%	33%	31%	35%	32%	30%	31%	36%	34%
75+% FRPL	29%	19%	31%	19%	26%	16%	32%	22%	26%	18%
Missing	3%	2%	2%	2%	1%	1%	2%	2%	3%	2%
Student Race/Ethnicity										
0-25% Students of Color	8%	18%	5%	17%	5%	17%	6%	15%	NA	NA
26-49% Students of Color	26%	35%	24%	35%	25%	36%	26%	36%	NA	NA
50-74% Students of Color	27%	25%	28%	25%	30%	26%	28%	27%	NA	NA
75+% Students of Color	36%	20%	41%	21%	39%	20%	37%	21%	NA	NA
Missing	3%	2%	2%	2%	1%	1%	2%	2%	NA	NA

*Preliminary race/ethnicity data in 2019-20 incomplete.
** School Poverty as defined by percentage of students enrolled in the Free or Reduced Priced Lunch program.

Greater proportions of beginning teachers of color are also located in schools where the percentage of students who are low-income is 75% or more. Over the past five years, the proportion of beginning teachers of color in these schools averages ten percentage points higher than that for all beginning teachers.

3. Distribution of students of color across districts

The above analysis demonstrates ways in which teachers of color are not uniformly distributed across schools and districts in the state, and differences in distribution patterns vary by individual racial and ethnic group. The same is true for students of color. Thus, it is important to understand which districts serve large numbers of students of color by individual racial and ethnic group.

Our initial look at the distribution of students of color in the state begins with noting that Hispanic/Latinx students comprise the majority (50.6%) of students of color in the state, and

18% of students of color are two or more races.[19] The smallest numbers of students of color are Native American/Alaskan Native and Hawaiian/Other Pacific Islander, comprising 1.3% and 1.2% of all students of color, respectively. Asian students make up 16.9% of all students of color, and Black/African Americans comprise 9.3% of all students of color.

Our analysis of 2019-20 data shows that distribution patterns vary greatly across individual racial and ethnic groups. When examining the number of districts who serve no students from individual racial and ethnic groups, we find that Black/African Americans are not located in 69 of the state's districts, Asians are not located in 67 districts and Hawaiian/Other Pacific Islanders (representing the smallest racial/ethnic group in the state) are not located in 127 districts. Results for Hispanic/Latinx and White students are quite different, as only six districts in the state do not have any Hispanic/Latinx students and only two districts serve no White students. There are no Multiracial students in 19 districts and no Native American/Alaskan Natives are found in 36 districts. Table 19 provides details.

Table 19: Distribution of Students of Color Across Districts: 2019-20							
	Black or African American	Hispanic/ Latinx	Native American or Alaskan Native	Asian	Hawaiian or Other Pacific Islander	Multiracial	White
Total number of students	50,850	275,179	14,793	91,697	13,399	98,254	603,752
Percent of all students	4.4%	24.0%	1.3%	8.0%	1.2%	8.6%	52.6%
Percent of all students of color	9.3%	50.6%	2.7%	16.9%	2.5%	18.1%	NA
Number of districts which serve no students in this group	69	6	36	67	125	19	2
Percent of students in the ten districts serving the greatest enrollment for the respective racial/ethnic group*	60%	29%	31%	62%	59%	35%	25%

*For a list of the ten districts in each racial/ethnic group, see Appendix O.

In addition to analyzing differences in the number of districts serving students in individual racial and ethnic groups, we also examined districts serving the largest number of students within each racial and ethnic group in 2019-20. Our method for the analysis, which appears in Table 19, is as follows: For each racial and ethnic group, we identified the ten districts serving the largest number of students in that individual group. Then we calculated the percentage of all the state's students belonging to that individual group who are served by those 10 districts. For example, the ten districts with the greatest number of Black/African American students serve 60% of all Black/African American students in the state. Similarly, the ten districts with the greatest number of Asian students serve 62% of all Asians in the state, and districts serving the largest numbers of Hawaiian/Pacific Islander students comprise 59% of all Hawaiian/Pacific Islanders in the state. In contrast, the ten districts with the greatest number of Hispanic/Latinx students served only 29% of the total number of Hispanic/Latinx students in the state. Additionally, the ten districts with the largest numbers of White students serve only 25% of all White students in the state. This data helps us understand that Black/African American

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[19] It should be noted that similar to teachers of color, there is an increase in the proportion of students of color who are Multiracial. Changes in reporting methods likely contributes to this increase, at least partially.

students, Asian students, and Hawaiian/Other Pacific Islanders are much more highly concentrated in a smaller number of districts than Hispanic/Latinx students or White students.

When examining the lists of specific districts who serve the largest numbers of students for each racial and ethnic group, we find that a number of districts serve multiple large groups of students of color. For example, the Federal Way School District is among the top 10 districts serving the largest numbers of students who are Black/African American, Hispanic/Latinx, Hawaiian/Other Pacific Islanders, and Multiracial. All ten districts serving the largest number of Black/African American students also serve the largest numbers of students of color from at least one other racial and ethnic group. This is also true for all ten districts serving the largest numbers of Hawaiian/Other Pacific Islanders.

In contrast, only three of the ten districts serving the largest numbers of Asian students also served the largest numbers of students from at least one other non-White group. As one might expect, districts serving the largest numbers of Native American/Alaskan Native students are either Tribal Agencies or districts located in close proximity to Native regions and do not serve large numbers of students from any other racial and ethnic groups. Appendix O provides the lists of districts serving the largest numbers of students from each individual racial and ethnic group.

This analysis of the distribution of students of color across individual districts provides one indication of how some students are concentrated in particular districts by racial and ethnic group. It also provides evidence that data and analyses regarding the distribution of both students of color and teachers of color should include disaggregation by individual racial and ethnic group because results can vary in important ways.

4. Retention and mobility of teachers of color

We examined the four most recent time periods of year-by-year retention and mobility data for teachers of color and conducted a number of comparisons. First, we compared retention and mobility outcomes for all beginning teachers of color to all White beginning teachers. Next, we compared teachers of color located in BEST-funded districts to White teachers in BEST-funded districts, as well as teachers of color in BEST districts with full-fledged induction programs to White teachers in full-fledged BEST districts. We also examined whether differences exist in retention and mobility outcomes for all beginning teachers of color to beginning teachers of color in BEST-funded districts and in districts with full-fledged induction programs. Finally, we examined differences in retention and mobility rates among teachers of color by their individual racial and ethnic groups. A complete set of data for all of these comparisons can be found in Appendices P1-P4.

In all four time periods of year-by-year data that we examined, no notable differences were found for any of the retention and mobility outcomes when comparing beginning teachers of color to White teachers. In fact, in some cases, the percentage of stayers who are teachers of color are slightly higher than that of White teachers (by just 1 or 2 percentage points).This finding holds even though the number of teachers of color increased over the four years of data. Similarly, no notable patterns of differences were identified for teachers of color in BEST-funded districts compared to White teachers in BEST-funded districts. Again, this is also true for beginning teachers of color and for White beginning teachers located in BEST districts with full-fledged implementation. Finally, no notable differences were found when examining outcomes for teachers of color in all BEST-funded districts compared to teachers of color in BEST districts with full-fledged induction programs. This also holds true for White beginning teachers in BEST-

funded districts compared to White beginning teachers in BEST districts with full-fledged induction programs.[20]

 As previously discussed, it is important to examine disaggregated data for teachers of color by individual racial and ethnic group to understand if different outcomes exist for specific races and ethnicities. When analyzing data about retention and mobility outcomes for individual racial and ethnic groups, we find that the most notable differences that exist are for Black/African American beginning teachers compared to other individual groups of beginning teachers of color and as compared to White beginning teachers. Across all four time periods examined, the percent of Black/African American teachers who stayed in the same school from one year to the next was lower than any other racial or ethnic group and lower than the average rate for all beginning teachers of color. For example, in the most recent period (2018-9 to 2019-20), only 67% of Black/African American beginning teachers stayed in the same school from one year to the next, compared to 72% of White beginning teachers and 73% of both Hispanic and Asian/Pacific Islander/Native Hawaiian teachers. Figure 6 displays this data in graphic form.[21]

Figure 6: Percent Beginning Stayers by Racial/Ethnic Group
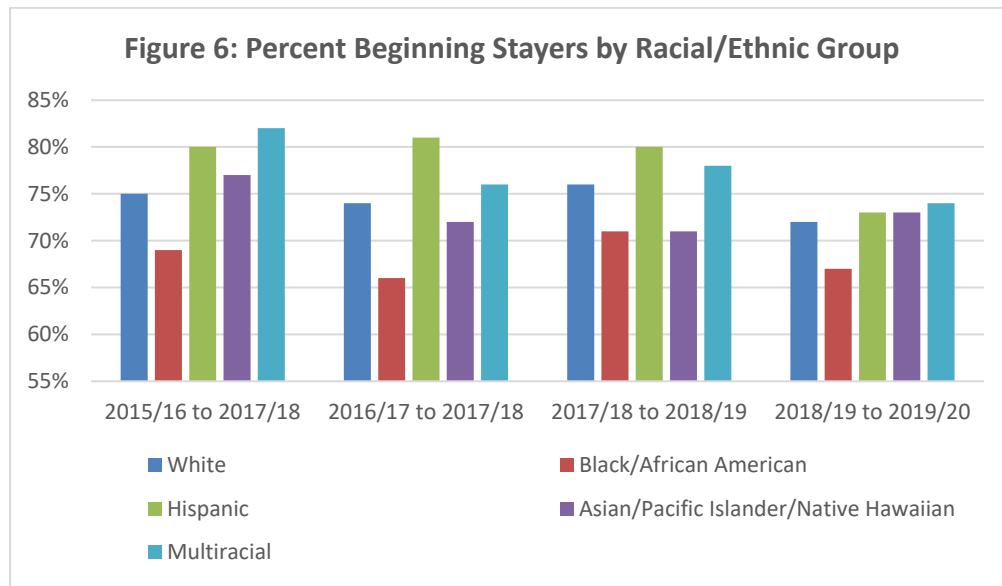
In Figure 6, we also see that higher percentages of beginning stayers are found for Hispanic/Latinx teachers compared to White and to Black/African American teachers in all four time periods. Additionally, Hispanic/Latinx beginning teachers had higher percentages of stayers than Asian/Pacific Islander/Native Hawaiian teachers in three of the four time periods examined. For the time period 2017-18 to 2018-19, for example, 80% of Hispanic/Latinx beginning teachers were stayers, compared to lower percentages for Black/African Americans (71%) Asians (71%), Whites (76%), and Multiracial beginning teachers (78%).

When examining differences in the percent of beginning teachers who exit the Washington state system from one year to the next, we find that in two of the years examined, Black/African Americans had notably higher exit rates of 19% for 2018-19 to 2019-20 and 15% for 2016-17 to

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[20] The lack of differences between beginning teachers of color and beginning White teachers likely impacts the results from the predictive models discussed in Section B of this report.

[21] Statistics for Native American/Alaskan Native beginning teachers are not included in Figure 6 due to much lower total numbers of beginning teachers in this group compared to all other groups. See Appendices P1-P4 for details about Native American/Alaskan Native beginning teachers.

2017-18. This compares to exit rates of 12% and 10%, respectively, for White teachers. Additionally, Black/African American beginning teachers had higher rates of exiting than any other racial/ethnic group in three of the four time periods examined. Appendices P1-P4 provide additional details.

5. Factors associated with retention and mobility for teachers of color

Similar to the statistical analyses discussed earlier, we examined the retention and mobility outcomes of teachers of color, but for these analyses we used a single-level regression model. We used this kind of predictive model because the number of beginning teachers of color is very small (around 500 to 600 teachers in each year), and the district-level variables did not show significant variance. Consequently, we used a single level-logistic regression model with four ethnic/racial group comparisons (Asian/Pacific Islander vs Hispanic/Latinx, Black/African American vs Hispanic/Latinx, and Multiracial vs Hispanic/Latinx). Native American and Alaska Native teachers are not included in this analysis because their total numbers are too small and we cannot run accurate models for these two groups. As with the prior statistical analyzes, we did two dimensional outcomes: 1) stayers vs non-stayers, and 2) stayers vs the non-stayers in other categories (movers in, movers out and exiters).

As we have seen in our previous analyses for all beginning teachers, full-time status is a significant predictor for beginning teachers of color staying in the same school over three of the four time periods (p < .001) (see Table 20). For beginning Black/African American teachers, staying in the same school compared with Hispanic/Latinx teachers is a significant and negative predictor in one time period (2015-16 to 2016-17). In this time period, beginning Black/African American teachers had a 63% predicted probability of staying in the same school compared to 75% of Hispanic/Latinx teachers, reflecting a 12 percentage difference.

Table 20: Summary of Logistic Regression Results: Beginning Teachers of Color Stayers vs Non-Stayers (Hispanic/Latinx as Reference Group)

Fixed Effects	2015-2016		2016-2017		2017-2018		2018-2019	
	Coeff	p	Coeff	p	Coeff	p	Coeff	p
School Poverty	0.08	.523	-0.03	.799	0.01	.961	-0.07	.498
Middle School	-0.25	.202	-0.03	.883	-0.19	.303	0.15	.372
High School	0.25	.213	-0.05	.790	0.09	.612	0.05	.753
Full time Status	0.33	.089	0.56	<.001 ***	0.67	<.001 ***	0.56	<.001 ***
District Enrollment	0.08	.523	-0.10	.365	0.12	.284	0.02	.868
Asian/Pacific Islander	0.19	.368	-0.18	.296	-0.28	.130	0.09	.566
Black/African American	-0.50	.046 *	-0.23	.333	-0.29	.200	-0.33	.090
Multiracial	0.25	.277	<.001	.990	0.15	.525	0.08	.727

Note. N = 497 teachers (2015-2016);N = 544 teachers (2016-2017);N = 557 teachers (2017-2018);N = 656
* p < .05, ** p < .01, *** p < .001.

In other findings, in the 2016-17 to 2017-18 time period, middle school level is a significant and negative predictor for beginning teachers of coloring moving in and exiting compared with other non-stayers (p < .05, and p < .01 levels). Also, beginning Black/African American teachers are positively and significantly predictive of moving within district, with 58% predicted probability compared to 39% of Hispanic/Latinx teachers. In 2017-18 to 2018-19, beginning teachers identifying as Multiracial were significantly and negatively more likely to be movers in district compared to other non-stayers (p < .05), while significantly and positively more likely to be movers out of district compared to other non-stayers (p < .05). We note that these results should be interpreted with caution given the small number of beginning teachers of color and

the variation in results across the four time periods examined. Summary tables of these analyses are provided in Appendices Q1-Q4.

In addition to our analyses for beginning teachers of color, we also conducted a similar investigation of the factors associated with the retention and mobility for all teachers of color in the state using Hispanic/Latinx as the reference group. As was the case for all other groups of teachers, we find that full-time status is a strong and significant predictor for all teachers of color staying in the same school for all four time periods examined ($p < .001$), and one's status as a beginning teacher of color is a negative predictor for staying in the same school compared to other teachers having more than one year of experience in three of the four time periods ($p < .001$ in 2018-19, and $p < .01$ in 2016-17 and 2017-18). Table 21 displays results.

We also find in two of the time periods examined, middle school level is a negative and significant predictor of teachers of color who are stayers, but high school level is positive and statistically significant in three of four time periods. In one time period, we find that school poverty is a negative and significant predictor of teachers of color who are stayers, and in another time period district enrollment is a negative and significant predictor of teachers of color who are stayers.

As is the case for beginning teachers, all Black/African American teachers have some statistically different retention and mobility outcomes as compared with all Hispanic/Latinx teachers. In 2015-16 and 2018-19, Black/African American teachers staying in the same school compared with Hispanic/Latinx teachers is a significant and negative predictor ($p < .05$ and $p < .001$, respectively).

Table 21: Summary of Logistic Regression Results: All Teachers of Color Statewide Stayers vs Non-Stayers (Hispanic/Latinx as Reference Group)

Fixed Effects	2015-2016		2016-2017		2017-2018		2018-2019	
	Coeff	p	Coeff	p	Coeff	p	Coeff	p
School Poverty	-0.06	.135	-0.02	.587	-0.15	<.001 ***	-0.05	.212
District Enrollment	-0.05	.200	-0.10	<.01 **	0.02	.547	0.02	.621
Middle School	-0.19	<.01 **	-0.11	.068	-0.03	.670	-0.12	<.05 *
High School	0.24	<.001 ***	0.07	.212	0.18	<.01 **	0.19	<.01 **
Full time Status	0.42	<.001 ***	0.41	<.001 ***	0.62	<.001 ***	0.54	<.001 ***
Beginning teacher	-0.11	.069	-0.17	<.01 **	-0.14	<.01 **	-0.34	<.001 ***
Asian/Pacific Islander	0.05	.406	0.08	.211	0.00	.966	0.04	.497
Black/African American	-0.19	<.05 *	-0.14	.073	-0.11	.150	-0.23	<.01 **
Multiracial	0.00	.992	-0.03	.719	-0.05	.532	0.06	.453

 N = 5280 teachers (2015-2016), 5684 teachers (2016-2017), 6080 teachers (2017-2018), 6440 teachers (2018-2019).

* $p < .05$, ** $p < .01$, *** $p < .001$.

In two years (2017-18 and 2018-19), Black/African American teachers were statistically more likely to exit the profession than Hispanic/Latinx teachers ($p < .01$ and $p < .05$), with large predictive probabilities (a 17 point difference in 2017-18 and a 10 point difference in 2018-19) (see Table 22). In one time period, teachers identifying as being Multiracial was a significant and negative predictor of exiters for teachers of color. In another time period, teachers identifying as being Multiracial was a significant and negative predictor of teachers of color who are movers out. Additionally, school poverty is a statistically significant and negative predictor of exiting in two time periods ($p < .05$ in 2015-16 and 2017-18). Table 22 presents details, and summary tables for all results are provided in Appendices R1-R4.

Fixed Effects	2015-2016		2016-2017		2017-2018		2018-2019	
	Coeff	p	Coeff	p	Coeff	p	Coeff	p
Intercept	-0.23	.124	-0.16	.221	-0.11	.407	-0.03	.803
School Poverty	-0.16	<.05 *	-0.08	.236	-0.15	<.05 *	-0.05	.463
District Enrollment	-0.02	.743	0.05	.491	-0.08	.273	0.05	.481
Middle School	-0.06	.591	-0.04	.744	-0.03	.794	-0.01	.934
High School	0.09	.423	0.00	.973	0.13	.237	0.22	<.05 *
Full time Status	-0.28	<.05 *	-0.22	.052	-0.51	<.001 ***	-0.12	.278
Beginning teacher	0.01	.918	0.19	.056	-0.05	.611	0.09	.283
Asian/Pacific Islander	-0.06	.611	-0.06	.582	0.11	.321	0.17	.125
Black/African American	0.18	.208	-0.03	.838	0.40	<.01 **	0.29	<.05 *
Multiracial	-0.06	.697	-0.12	.412	-0.19	.166	-0.32	<.05 *

Table 22: Summary of Logistic Regression Results: All Teachers of Color Exiters vs Other Non-Stayers (Hispanic/Latinx as Reference Group)

N = 899 teachers (2015-2016), 1112 teachers (2016-2017), 989 teachers (2017-2018), 1065 teachers (2018-2019).
* p < .05, ** p < .01, *** p < .001.

Summary

This study focused on improving our understanding of the beginning teacher workforce in Washington state. We examined trends over time regarding participation in the BEST program and analyze factors associated with beginning teacher retention and mobility, including statistical analyses designed to identify factors associated with differences in retention and mobility outcomes. Additionally, we provided detailed information about the distribution, retention, and mobility of teachers of color and analyzed outcomes by specific racial and ethnic groups. In this section, we briefly summarize key findings.

- *The number of districts participating in the BEST program has increased steadily in recent years, resulting in a dramatic increase in the number of beginning teachers now working in BEST-funded districts.*

From 2015-16 to 2019-20, the number of participating districts has increased steadily, rising from 71 districts to 197. Similarly, the proportion of the state's beginning teachers who were located in BEST-funded districts dramatically increased from 53% in 2015-16 to 84% in 2019-20. This corresponds with an increasing number of new teachers statewide until 2019-20. Most beginning teachers in Washington state are now receiving induction supports, but it may also be important to examine the quality of those supports. As DeAngelis et al. (2103) found, simply being assigned a mentor is no guarantee of support to new teachers. Evidence suggests that the quality of the mentoring may matter, and that may start with highly skilled mentors working with new teachers. Understanding the training of mentor teachers, their ability to provide helpful instructional feedback, and the district's provision of supports (e.g., release time for mentors to observe new teachers) may further uncover comprehensive induction supports that may make a difference for new teachers.

- *There is a notable decrease in the number of beginning teachers in 2019-20.*

The number of beginning teachers in 2019-20 represents a significant decrease in the number of beginning teachers in each of the prior five years (2014-15 to 2018-19). In those prior five years, the number of teachers increased from 3,372 in 2014-15 to nearly 4,000 in 2018-19. However, there was a drop of nearly 1,000 beginning teachers just in the past year (from 2018-

19 to 2019-20). Since 2018-19, there have been significant changes in the state's funding model for teacher salaries, and perhaps this is one factor contributing to the change. While we do not offer explanations for this significant one-year decline, we do note that it will be important to gauge whether or not this pattern of decline continues in the years ahead.

- *More than half of beginning teachers now work in schools with poverty levels above 50%, and nearly half work in schools where students of color represent more than half of the student body.*

A larger proportion of beginning teachers are located in higher poverty schools compared to ten years ago (from 41% to 52% since 2009-10). There is a similar shift in the racial/ethnic composition of students of color (an increase of 13 percentage points since 2009-10). These shifts have potential implications for new teachers, 79% of whom are White. Working in diverse school contexts requires a complex understanding of students whose life experiences may be different from their own.

- *Retention and mobility rates for beginning teachers are different than those for all teachers in the state.*

This is true for both year-by-year rates of retention and mobility and rates after five years. When examining retention and mobility patterns for all teachers and beginning teachers, smaller percentages of beginning teachers stay in the same school, and larger percentages of beginning teachers move in district, out of district, and exit the Washington state system. In our statistical analyses of factors associated with retention and mobility, statistically significant differences are found between the retention and mobility of all teachers in the state and all beginning teachers.

- *School poverty is not strongly associated with the percent of beginning teachers who stay in the same school, but it is a strong and negative predictor for all teachers in the state.*

The results from our statistical models examining retention of all teachers in the state demonstrate that when controlling for all other factors, school poverty is a unique and negative predictor of teacher retention in the same school. That is, lower percentages of teachers stay in schools serving higher proportions of students who are low-income compared to teachers working in schools with lower proportions of low-income students. This result is highly significant for all time periods examined in this study, and is consistent with results from other studies, both nationally and in other states. In contrast, for beginning teachers school poverty was only predictive for one time period examined with a relatively weak significance level.

- *Teachers who are full-time have better retention and mobility outcomes than teachers who are part-time.*

For both beginning teachers and all teachers in the state, full-time status is consistently and strongly predictive of teachers who stay in the same school from one year to the next. For all teachers in the state, full-time teachers are statistically less likely to exit the Washington state system than part-time teachers for all years examined. This same result holds for beginning teachers in some years.

- *High school teachers have different retention and mobility outcomes than elementary teachers.*

High school teachers are more likely to stay in the same school and less likely to move within the district as compared to elementary teachers. This is true for all teachers and beginning teachers. All high school teachers are also more likely to move out of district and exit the Washington state system, but this result does not consistently hold for beginning high school teachers.

- *District size is a significant predictor of teacher mobility in and out of district.*

While district enrollment size is not associated with statistically significant differences for stayers or exiters, district size is a unique and powerful predictor of teachers who move in district and move out of district. This is the case for all teachers and for beginning teachers. Teachers in larger districts are more likely to move within the district, but less likely to move out of district. This result seems logical, as larger districts with more schools provide more options for teachers to move within the district. In smaller districts, teachers often need to move to another district to locate other employment options.

- *The choice of mentor model (colleague or released) varies by size of the district and region of the state.*

A much higher proportion of larger districts (those with 10,000 students or more) use a released mentor model as compared to smaller districts. Conversely, the overwhelming majority of districts with student enrollments below 1,000 use the colleague mentor model. Higher proportions of districts in the Central Puget Sound (ESD 121) use the released mentor model, likely due to the fact that a majority of the state's largest districts are located in ESD 121.The colleague mentor model is more prevalent in districts located in Eastern Washington. Somewhat equal proportions of districts located in Western Washington outside ESD 121 use released and colleague mentor models. While mentor model type was included in initial statistical analyses as a predictor, mentor type was not associated with any statistically significant differences in retention and mobility outcomes.

- *Beginning teachers located in BEST-funded districts did not have statistically significant differences in retention and mobility outcomes from other beginning teachers.*

BEST status (including whether a BEST district is considered to have a full-fledged induction program) is not a unique predictor for any retention or mobility outcomes. While the dramatic increase in participation rates in the BEST program is certainly a positive policy outcome, it becomes more problematic in more recent years to discern differences in the impact that the BEST program has compared to the steadily decreasing number of districts who do not receive BEST funding. Another possible factor impacting results is the significant amount of missing data regarding whether or not districts met the criteria for full-fledged BEST induction standards.

- *The state's teacher workforce is very slowly becoming more racially and ethnically diverse, but some racial/ethnic groups have shown little change over time.*

Hispanic/Latinx teachers represent the largest proportion of all teachers of color and also have the largest growth rates over time. The number of teachers who identify as Multiracial also are increasing at higher rates than other racial and ethnic groups. However, Black/African American

and Native American/Alaska Native teachers have made few gains over time. This is occurring over a time period when the number and proportions of students of color in the state grows at a pace far greater than that for teachers of color. In the 2019-20 school year, 47% of students in the state were students of color, while only 12% of the state's teachers were teachers of color.

- *The regions of the state where teachers of color are located varies by individual racial and ethnic group.*

The majority of Black/African American teachers, Asian/Pacific Islanders, and Multiracial teachers are located in the Central Puget Sound region. However, nearly half of all Hispanic/Latinx teachers are located in Eastern Washington. Native American/Alaskan Native teachers are more evenly distributed across the different geographic regions of the state.

- *Higher proportions of beginning teachers of color work in schools with higher levels of poverty and greater proportions of students of color.*

Higher proportions of beginning teachers of color are located in schools where the percent of students of color is 75% or more. And conversely, lower proportions of teachers of color are located in schools where the percent of students of color is 25% or less. Greater proportions of beginning teachers of color are also located in schools where the percentage of students who are low-income is 75% or more. Over the past five years, the proportion of beginning teachers of color in these schools averages 10 percentage points higher than that for all beginning teachers.

- *Differences exist in the proportion of students of color located in larger districts by individual racial and ethnic group.*

When examining teachers of color in the workforce, it is also important to understand where students of color are located and whether differences exist among racial and ethnic groups. Some students from different racial and ethnic groups are more concentrated in a small number of districts than students from other groups. The ten districts with the greatest number of Black/African American students served 60% of all Black/African American students, and there were 69 districts that did not serve any Black/African American students. Similar concentration levels are found for Asian students and Pacific Islanders. In contrast, the ten districts with the greatest number of Hispanic/Latinx students served only 29% of the total number of Hispanic/Latinx students in the state and only 6 districts in the state did not serve any Hispanic/Latinx students. Similarly, the ten districts with the largest numbers of White students serve only 25% of all White students with only 2 districts without White students.

- *Full-time status is a unique predictor for teachers of color staying in the same school. Statistical analyses also revealed differences among the racial/ethnic groups with regard to retention and mobility outcomes. Teacher's status as a beginning teacher of color is a negative predictor for staying in the same school in three of four time periods examined. In some years, beginning Hispanic/Latinx teachers are more likely to stay in the same school as compared to beginning Black/African American teachers and less likely to move within the district in some time periods. In one year, beginning teachers identifying as Multiracial are significantly and negatively more likely to move within or out of their district compared to other non-stayers. In some years, all Black/African American teachers (regardless of years of experience) have statistically lower rates of staying in*

the same school and higher rates of exiting as compared to all Hispanic/Latinx teachers in the state.

As is the case for all teachers in the state and all beginning teachers in the state, full-time teachers of color and full-time beginning teachers of color are more likely to stay in the same school as compared to part-time teachers of color. Retention rates for Hispanic/Latinx teachers are uniquely different and higher than Black/African Americans. In some years, beginning Hispanic/Latinx teachers are more likely to stay in the same school as compared to beginning Black/African American teachers and less likely to move within the district. In one year, beginning teachers identifying as Multiracial are significantly and negatively more likely to move within their district and more likely to move out of district compared to other non-stayers. Similarly, in two of four time periods examined, Black/African American teachers (regardless of years of experience) are less likely to stay and more likely to exit as compared to all Hispanic/Latinx teachers in the state, with large differences between the two groups. These results highlight the importance of using disaggregated data to examine outcomes for each unique racial and ethnic group, in addition to analyzing outcomes for all teachers of color.

While this study provides a comprehensive analysis of teacher retention and mobility, including unique predictors of retention and mobility among all teachers, all beginning teachers, and teachers of color, we do not examine some other related issues. Further inquiry is needed into matters such as reasons why teachers make particular career decisions, the impact of school working conditions and leadership, and the influence of efforts to further diversify the teacher workforce.

Discussion and Implications

Our inquiry found that most beginning teachers in Washington state are now receiving induction supports, but it may also be important to examine the quality of those supports. As DeAngelis et al. (2103) found, simply being assigned a mentor is no guarantee of effective support for new teachers. Evidence suggests that the quality of the mentoring matters, and that may start with highly skilled mentors working with new teachers. The *quality* of the training of mentor teachers and mentors' ability to provide helpful instructional feedback and build collaborative relationships within the school are also crucial. New teachers often need targeted support as they learn how to plan, execute, evaluate, and adjust content-specific instruction for heterogeneous groups of learners, and learn to navigate the particular state, district, and school cultures and contexts in which they find themselves (Feiman-Nemser, 2003; Achinstein & Barrett, 2004). Induction supports are particularly important for beginning teachers in Washington given that the majority are now located in schools with increasing socioeconomic and ethnic/racial diversity.

Furthermore, there are other aspects of support for new teachers that can help them provide high quality instruction and motivate them to stay in the profession. Novice teachers' professional success and satisfaction is tied to the particular school site and that working conditions found to support their teaching include collegial interaction, opportunities for growth, appropriate assignments, adequate resources and school-wide structures to support student learning. These issues may be particularly acute for new teachers in low-income schools (Johnson et al., 2004). Additional factors include effective school and district leadership, access to high quality curricular supports, and strong relationships with families and the local community. In sum, additional inquiry about the impact of induction supports for new teacher could include the quality and availability of mentoring, the types of working conditions, access to

curricular and other resources, the quality of collaborative work with colleagues, and the impact of school and district leadership.

Particular attention should be paid to multiple types of induction supports for beginning teachers of color. We know that most beginning teachers are located in high poverty schools where students of color are in the majority. Villegas and Irvine (2010) found that teachers of color often seek to teach in low-income and communities of color. In their national study of Black women teachers, Carver and Darling-Hammond (2017) found that three-quarters of these new Black teachers were certified through an alternative route program with less preparation and student teaching experience. While these women were just as likely to receive a mentor as White teachers, they met with their mentor less frequently and found their mentoring experiences to be less effective. For the state's BEST program, attention should be paid to improving the racial and ethnic diversity of the mentor teacher cadre. It may be beneficial to consider how the mentor selection process can help ensure an appropriate match for new teachers of color. This will require a willingness to recognize and acknowledge racial and ethnic differences in supporting staff and students. Mentoring is perhaps the most obvious form of support for beginning teachers, but there are areas, such as curricular resources, relationships with families and communities, and school leadership where a recognition of racial and ethnic differences is necessary.

In this study, we uncovered important differences in the distribution, retention, and mobility for teachers of color by individual racial and ethnic groups. These differences are consistent with national findings that educator diversity has increased but not in all non-white racial and ethnic groups, and that same-school retention rates are lower for Black teachers (US DOE, 2016b). In this report, we discuss differences in how students of color are distributed across the state and corresponding teachers of color by racial/ethnic group. Students who are Black/African American or Asian/Pacific Islanders are more concentrated in a smaller number of districts compared to Hispanic/Latinx or white students. These differences highlight the importance of using disaggregated data to examine outcomes for each unique racial and ethnic group, in addition to analyzing outcomes for all teachers and students of color. There are also implications regarding efforts to diversify the teacher workforce because Hispanic/Latinx beginning teachers have better retention and mobility outcomes than other beginning teachers of color.

For both beginning teachers and all teachers statewide, our inquiry found that one of the strongest and most consistent predictors of increased teacher retention was having a full-time assignment. There are a number of potential reasons why a teacher has a part-time assignment, including the individual preference of the teacher. However, other factors may also be at play, including a district's lack of ability to offer a full-time assignment, perhaps due to inadequate resources. Examination of the reasons why part-time status negatively impacts teacher retention and mobility is warranted, as this represents a circumstance that could potentially be changed in order to improve teacher retention.

While our analysis does not provide precise explanations for the significant one-year decline in the number of beginning teachers, we note that it will be important to gauge whether or not this pattern of decline continues in the years ahead. Since 2018-19, there have been significant changes in the state's funding model for teacher salaries, and perhaps this is one factor contributing to the significant decline in the number of beginning teachers in 2019-20. We note that these changes in teacher salaries present budgetary challenges for districts, and can restrict the number of new teachers districts can afford to hire. These dramatic changes in the compensation system may also cause some districts to re-assign certificated staff serving in

instructional coaching, mentoring, and other support roles to classroom teaching responsibilities, thereby reducing demand for beginning teachers. The capacity for districts to hire and support beginning teachers may also be impacted by future budgetary challenges related to COVID-19.

The data in this study was limited to quantitative measures, but other types of inquiry may be well-suited to advance our knowledge of how best to support and retain a diverse, well-qualified beginning teacher workforce. Other forms of inquiry include case studies of districts who vary in their approach to induction supports, surveys of beginning teachers, teacher mentors, and other school leaders regarding strategies for successful implementation of induction, and focus groups aimed to understand the perspectives of teachers by individual racial and ethnic groups.

References

Achinstein, B, & Barrett, A (2004). (Re) Framing Classroom Contexts: How New Teachers and Mentors View Diverse Learners and Challenges of Practice. *Teachers College Record*, *106*(4), 716-746.

Ahman, FZ & Boser, U (2014). *America's leaky pipeline for teachers of color: Getting more teachers of color into the classroom.* Washington, D.C.: Center for American Progress.

Bastian, KC & Marks, JT (2017). Connecting teacher preparation to teacher induction: Outcomes for beginning teachers in a university-based support program in low-performing schools. *American Educational Research Journal, 54*(2), 360-394.

Borman, G, & Dowling, N (2008). Teacher attrition and retention: A meta-analytic and narrative review of the research. *Review of Educational Research, 78*(3), 367-409.

Byrk, AS, Lee, VE, & Smith, JB (1990). High school organization and its effect on teachers and students: An interpretive summary of the research. In W. J. Clune & J. F. Witte (Eds.), *Choice and control in American education: Volume 1. The Theory of choice and control in American education*. Philadelphia: Falmer Press.

Carter Andrews, DJ, Castro, E, Cho, CL, Petchauer, E, Richmond, G, & Floden, R (2019). Changing the narrative on diversifying the teaching workforce: A look at historical and contemporary factors that inform recruitment and retention of teachers of color. *Journal of Teacher Education*, *70*(1), 6-12.

Carver-Thomas, D (2018). *Diversifying the teaching profession: How to recruit and retain teachers of color*. Palo Alto, CA: Learning Policy Institute.

Carver-Thomas, D and Darling-Hammond, L (2017). Why Black Women Teachers Leave and What Can Be Done About it, in Abiola Farinde-Wu, Ayana Allen-Handy, Chance W. Lewis (ed.) *Black Female Teachers (Advances in Race and Ethnicity in Education, Volume 6)*. Emerald Publishing Limited, pp.159 - 184.

DeAngelis, KJ, Wall, AF, and Che, J (2013). The Impact of Preservice Preparation and Early Career Support on Early- to Mid-Career Teachers' Career Intentions and Decisions. *Journal of Teacher Education, 64*(4), 338–355.

DeCesare, D, Workman, S, & McClelland, A (2016). *How do school districts mentor new teachers?* (REL 2016-125). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Educational and Regional Assistance, Regional Educational Laboratory Central.

Elfers, AM, Plecki, ML, & Van Windekens, A (2017). *Understanding Teacher Retention and Mobility in Washington State*. Research commissioned by the Washington State Office of the Superintendent of Public Instruction. Seattle, WA: Center for the Study of Teaching and Policy, University of Washington.

Feiman-Nemser, S (2001). From preparation to practice: Designing a continuum to strengthen and sustain teaching. *Teachers College Record, 103*(6), 1013-1055.

Feiman-Nemser, S (2003). What new teachers need to learn. *Educational Leadership*, *60*(8), 25- 29.

Fletcher, SH, Strong, M, & Villar, A (2008). An investigation of the effects of variations in mentor-based induction on the performance of students in California. *Teachers College Record, 110*(10), 2271-2289.

Glazerman, S, Isenberg, E, Dolfin, S, Bleeker, M, Johnson, A, Grider, M, & Jacobus, M (2010). Impacts of comprehensive teacher induction: Final results from a randomized controlled study (NCEE 2010-4027). Washington, DC: U.S. Department of Education.

Goldring, R, Taie, S, & Riddles, M (2014). *Teacher Attrition and Mobility: Results from the 2012-13 Teacher Follow-up Survey* (NCES 2014-077). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

Ingersoll, RM (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal*, *38*(3), 499-534.

Ingersoll, R, & Merrill, E (2017). *A Quarter Century of Changes in the Elementary and Secondary Teaching Force: From 1987 to 2012*. Statistical Analysis Report (NCES 2015-076). Washington, DC: National Center for Education Statistics.

Ingersoll, R, Merrill, E, Stuckey, D, and Collins, G (2018). *Seven Trends: The Transformation of the Teaching Force – Updated October 2018*.CPRE Research Reports. Retrieved July 23, 2020 from https://repository.upenn.edu/cpre_researchreports/108

Ingersoll, R, & Strong, M (2011). The impact of induction and mentoring programs for beginning teachers: A critical review of the research. *Review of Educational Research, 81*(2), 201-233.

Ingersoll, RM (2012). Beginning teacher induction what the data tell us. *Phi Delta Kappan*, *93*(8), 47-51.

Ingersoll, R, & Kralik, JM (2004). The impact of mentoring on teacher retention: What the research says. *Research Review, Education Commission of the States*, 1-23. Retrieved on February 13, 2005, from www.ecs.org/clearinghouse/50/36/5036.htm

Ingersoll, R, Merrill, L, & Stuckey, D (2014). Seven Trends: The Transformation of the Teaching Force. Updated April 2014. CPRE Report.# RR-80. *Consortium for Policy Research in Education*.

Johnson, S, & Birkeland, S (2003). Pursuing a "sense of success": New teachers explain their career decisions. *American Educational Research Journal, 40*(3), 581-617.

Johnson, SM, Kardos, SM, Kauffman, D, Liu, E, & Donaldson, ML (2004). The support gap: new teachers' early experiences in high-income and low-income schools. *Education Policy Analysis Archives, 12*(61). Retrieved October 28, 2004 from http://epaa.asu.edu/epaa/v12n61/.

Kapadia, K, Coca, V, & Easton, JQ (2007). Keeping new teachers: A first look at the influences of induction in the Chicago public schools. Chicago, IL: Consortium on Chicago School Research at the University of Chicago.

Lortie, DC (1975). *Schoolteacher: A Sociological Study*. Chicago: University of Chicago Press.

Murnane, R, Singer, JD, & Willett, JB (1988). The Career Paths of Teachers: Implications for teacher supply and methodological lessons for research. *Educational Researcher, 17*(6), 22-30.

Office of Superintendent of Public Instruction (OSPI). (2018). *Standards for Beginning Educator Induction: Effective Support for Washington State Educators*. Olympia, WA: Author.

Petchauer, E, Bowe, AG & Wilson, J (2018). Winter is coming: Forecasting the impact of edTPA on Black teachers and teachers of color. *Urban Review, 50*(2), 323-343.

Philip. TM, & Brown, AL (2020). *We All Want More Teachers of Color, Right?: Concerns about the Emergent Consensus*. Boulder, CO: National Education Policy Center. Retrieved July, 23, 2020 from http://nepc.colorado.edu/publication/diversity.

Plecki, ML, Elfers, AM & Van Windekens, A (2017). *Examining Beginning Teacher Retention and Mobility in Washington State*. Research commissioned by the Washington State Office of the Superintendent of Public Instruction. Seattle, WA: Center for the Study of Teaching and Policy, University of Washington.

Rockoff, JE (2008). *Does mentoring reduce turnover and improve skills of new employees? Evidence from teachers in New York City* (Working Paper No. 13868). Cambridge, MA: NBER. Retrieved from http://www.nber.org/papers/w13868

Ronfeldt, M, Loeb, S, & Wyckoff, J (2013). How teacher turnover harms student achievement. *American Educational Research Journal*, *50*(4), 4–36.

Ronfeldt, M, & McQueen, K (2017). Does New Teacher Induction Really Improve Retention? *Journal of Teacher Education, 68*(4), 394-410.

Shen, J (1997). Teacher retention and attrition in public schools: Evidence from SASS91. *The Journal of Educational Research, 91*(2), 81-88.

Smith, TM, & Ingersoll, RM (2004). What are the effects of induction and mentoring on beginning teacher turn over? *American Educational Research Journal, 41*(3), 681-714.

Sun, M. (2018). Black teachers' retention and transfer patterns in North Carolina: How do patterns vary by teacher effectiveness, subject, and school conditions? *AERA Open, 4*(3), 1-23.

U.S. Department of Education (2016a). National Center for Education Statistics, National Teacher and Principal Survey (NTPS), "Public School Teacher Data File." Washington, DC: Author.

U.S. Department of Education (2016b). The state of racial diversity in the educator workforce. Policy and Program Studies Service, Office of Planning, Evaluation and Policy

Development. Washington, DC: Author.

Villegas, A.M., Strom, K. & Lucas, T. (2012). Closing the racial/ethnic gap between students of color and their teachers: An elusive goal. *Equity and Excellence in Education, 45*(2), 283-301.

Wang, J, Odell, SJ, & Schwille, SA (2008). Effects of teacher induction on beginning teachers' teaching: A critical review of the literature. *Journal of Teacher Education, 59*(2), 132-152.

Villegas, AM & Irvine, JJ (2010). Diversifying the teaching force: An examination of major arguments. *The Urban Review, 42*, 175-192.

Appendices

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Appendix O: Ten WA Districts with Largest Enrollments of Students of Color by Race/Ethnic Group: 2019-20

								Statewide							
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20*
Student Enrollment	1,013,189	1,026,682	1,031,846	1,038,345	1,036,135	1,041,892	1,043,536	1,050,900	1,056,809	1,075,107	1,097,564	1,114,078	1,127,063	1,134,683	1,147,573
# Teachers* (Headcount)	56,403	56,620	56,894	57,282	56,004	56,222	55,279	55,772	56,761	58,246	60,026	61,604	62,991	64,581	65,071
FTE Teachers	53,615	53,804	54,103	54,479	53,349	53,591	52,760	53,308	54,407	56,007	57,732	59,381	60,823.06	62,376.97	62682.09
Teacher Gender															
Female	71.1%	71.2%	71.5%	71.7%	71.8%	71.8%	71.9%	72.2%	72.5%	72.9%	73.3%	73.6%	73.9%	74.1%	74.4%
Male	28.9%	28.8%	28.5%	28.3%	28.2%	28.2%	28.1%	27.8%	27.5%	27.1%	26.7%	26.4%	26.1%	25.9%	25.6%
Education															
Bachelor	38.2%	37.0%	36.4%	35.4%	33.5%	32.6%	31.5%	31.0%	31.3%	32.4%	31.9%	31.9%	31.8%	31.4%	30.1%
Master	60.0%	61.0%	62.0%	63.0%	64.8%	65.7%	66.7%	67.2%	66.9%	65.8%	65.6%	65.6%	65.7%	65.9%	67.2%
Doctorate	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.7%	0.7%
Other	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.7%	1.7%	1.7%	1.7%	1.6%
Missing	0.2%	0.4%	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.4%
Teacher Age (jn given year)															
20-30	15.4%	15.6%	15.5%	14.9%	13.1%	12.8%	12.1%	12.4%	13.0%	14.2%	15.1%	15.7%	16.1%	16.3%	NA
31-40	24.2%	24.6%	24.9%	25.3%	25.8%	25.9%	25.8%	25.7%	26.0%	26.0%	26.1%	25.9%	25.9%	25.6%	NA
41-50	26.2%	25.5%	25.0%	25.1%	25.3%	25.5%	26.1%	26.4%	26.5%	26.5%	26.8%	27.0%	27.4%	27.8%	NA
51-60	29.9%	29.7%	29.1%	28.2%	28.2%	27.7%	27.2%	26.5%	25.6%	24.6%	23.7%	23.1%	22.5%	22.3%	NA
61+	4.3%	4.7%	5.5%	6.5%	7.7%	8.1%	8.8%	9.1%	8.9+	8.6%	8.4%	8.2%	8.2%	8.0%	NA
Teacher Race/Ethnicity															
Asian/Pacific Islander/Native Hawaiian	2.5%	2.6%	2.6%	2.6%	2.7%	2.5%	2.5%	2.5%	2.6%	2.7%	2.8%	3.0%	3.1%	3.2%	3.2%
African American	1.5%	1.4%	1.4%	1.4%	1.4%	1.3%	1.2%	1.2%	1.2%	1.2%	1.2%	1.3%	1.3%	1.4%	1.4%
Hispanic/Latinx** American	2.4%	2.5%	2.7%	2.8%	2.8%	3.2%	3.5%	3.4%	3.2%	3.7%	3.9%	4.2%	4.5%	4.9%	5.1%
Indian/Alaskan Native	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%
White (non-Hispanic)	92.8%	92.7%	92.5%	92.4%	92.3%	90.9%	89.7%	89.6%	90.9%	90.3%	89.9%	89.3%	88.9%	88.2%	87.9%
Multiracial	*NA*	*NA*	*NA*	*NA*	*NA*	1.4%	2.4%	2.5%	1.3%	1.4%	1.4%	1.4%	1.5%	1.5%	1.6%
Teacher Experience															
0-4 years	21.8%	21.6%	22.1%	21.7%	18.3%	17.2%	15.9%	16.3%	18.3%	21.2%	23.6%	24.9%	25.2%	25.4%	23.2%
5-14 years	37.4%	37.6%	37.6%	37.8%	39.8%	40.8%	41.4%	40.9%	39.4%	37.5%	35.9%	35.1%	35.3%	35.7%	36.5%
15-24 years	24.5%	24.6%	24.5%	24.5%	25.2%	25.3%	25.9%	26.2%	26.0%	25.6%	25.3%	25.3%	25.1%	25.0%	26.0%
25 yrs or more	16.4%	16.2%	15.8%	15.9%	16.7%	16.7%	16.8%	16.7%	16.2%	15.7%	15.1%	14.7%	14.4%	14.0%	14.3%

Appendix A: Demographic Characteristics of Washington Teacher Workforce: 2005-06 to 2019-20

*S275 duty root 31, 32, 33 or 34 with FTE designation greater than 0 in given year.

**Individual is considered to be Hispanic if labeled "Y" in "Hispanic" field. If considered Hispanic, individual's other racial/ethnic identities are not considered. Those in remaining non-Hispanic racial/ethnic categories were labeled "N" in "Hispanic" field.

Appendix B: District and School Characteristics of All Beginning Teachers* Statewide: 2009-10 to 2019-20											
	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20**
# Teachers (Headcount)	1,344	1,959	1,883	2,412	2,914	3,375	3,752	3,708	3,676	3941	3,002
Region of the State											
Central Puget Sound (ESD 121)	44%	44%	50%	49%	45%	46%	44%	43%	41%	44%	49%
Western WA (outside ESD 121)	31%	31%	28%	28%	32%	30%	31%	30%	32%	32%	31%
Eastern WA	25%	25%	22%	23%	23%	24%	25%	27%	26%	23%	20%
District Total Student Enrollment											
Fewer than 999	6%	6%	6%	6%	6%	6%	5%	6%	8%	9%	12%
1,000-4,999	20%	20%	18%	17%	18%	18%	18%	18%	19%	19%	20%
5,000-9,999	14%	16%	14%	15%	16%	15%	15%	14%	15%	14%	12%
10,000-19,999	30%	28%	29%	29%	27%	30%	26%	26%	24%	21%	21%
20,000+	29%	30%	33%	33%	32%	32%	34%	35%	34%	37%	35%
Other (e.g., charter, institution)							1%	1%	0%	0%	0%
School Level											
Elementary	47%	44%	45%	47%	52%	54%	55%	55%	55%	51%	48%
Middle School	16%	19%	19%	18%	17%	17%	16%	16%	17%	18%	18%
High School	30%	30%	30%	28%	24%	24%	22%	21%	20%	21%	20%
Other (e.g., PK-8, 1-8, 6-12)	7%	7%	6%	8%	6%	5%	6%	6%	7%	6%	7%
Missing							2%	2%	1%	5%	7%
Poverty of School											
0-25% FRPL	25%	22%	22%	20%	18%	18%	19%	20%	20%	18%	19%
26-49% FRPL	32%	33%	31%	31%	30%	30%	30%	28%	31%	27%	27%
50-74% FRPL	27%	27%	26%	28%	29%	29%	29%	31%	32%	31%	34%
75+% FRPL	14%	17%	20%	20%	21%	20%	19%	19%	16%	22%	18%
Unidentified	2%	2%	1%	1%	2%	3%	2%	2%	1%	2%	2%
Student Race/Ethnicity											
0-25% Students of Color	31%	24%	20%	21%	21%	19%	18%	17%	17%	15%	NA
26-49% Students of Color	33%	39%	38%	38%	39%	35%	35%	35%	36%	36%	NA
50-74% Students of Color	18%	19%	22%	21%	20%	23%	25%	25%	26%	27%	NA
75+% Students of Color	17%	17%	19%	18%	18%	20%	20%	21%	20%	21%	NA
Unidentified	2%	2%	1%	1%	2%	3%	2%	2%	1%	2%	NA

Notes: *Duty root 31, 32, 33 or 34 with FTE designation >0. Beginning teachers is based on teachers with less than one year of experience.

**Based on preliminary data which does not include some programmed fields and some incompleted records.

Percentages may not add up to exactly 100% due to rounding.

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20**
				Appendix C: Characteristics of Beginning Teachers* in BEST Districts: 2009-10 to 2019-20							
Number of BEST districts	30	14	28	21	7	36	71	132	163	174	197
# Teachers in BEST districts	275	316	194	225	206	1,093	2,001	2,593	2,991	3,092	2,526
Teacher Gender											
Female	68%	73%	65%	70%	77%	73%	74%	74%	75%	75%	76%
Male	32%	27%	35%	30%	23%	28%	26%	26%	25%	25%	24%
Full-time/Part-time Status											
Full-Time (FTE= > .9)	70%	80%	76%	83%	85%	85%	88%	88%	87%	88%	84%
Not Full-Time (FTE < .9)	30%	20%	24%	17%	15%	16%	12%	12%	13%	12%	16%
Education											
Bachelor and other	58%	47%	53%	54%	70%	55%	58%	59%	62%	61%	59%
Masters and above	40%	51%	42%	42%	28%	42%	39%	38%	35%	34%	33%
Unidentified	2%	2%	5%	4%	2%	3%	3%	3%	3%	4%	7%
Teacher Age (in given year)											
20-30	68%	70%	60%	63%	70%	65%	63%	61%	60%	59%	NA
31-40	15%	17%	23%	21%	16%	22%	22%	21%	22%	22%	NA
41-50	12%	9%	13%	12%	11%	10%	11%	12%	12%	13%	NA
51-60	5%	4%	4%	4%	3%	3%	4%	4%	5%	5%	NA
61+	0%	0%	1%	0%	0%	0%	0%	1%	1%	1%	NA
Missing								0%			
Teacher Race/Ethnicity											
Asian/Pacific Islander/Native Hawaiian	4%	4%	3%	3%	3%	5%	4%	5%	4%	5%	5%
Black/African American	2%	1%	2%	2%	2%	3%	2%	2%	2%	3%	3%
Hispanic/Latinx	6%	7%	5%	4%	4%	6%	7%	8%	8%	9%	10%
Native American/Alaskan Native	0%	0%	1%	0%	1%	0%	1%	1%	1%	1%	1%
White (non-Hispanic)	88%	85%	87%	89%	87%	85%	83%	83%	82%	80%	79%
Multiracial	NA***	4%	3%	2%	2%	2%	3%	2%	2%	2%	3%

Notes: *Duty root 31, 32, 33 or 34 with FTE designation >0. Beginning teachers is based on teachers with less than one year of experience.
**Based on preliminary data which does not include some programmed fields.
*** Multiracial or "More than one race" category was added in 2010-11.
Percentages may not add up to exactly 100% due to rounding.

			Appendix D: Number of Districts Identifying as Having Full-Fledged Implementation				
Year	# of BEST Districts	# Identifying as Full-Fledged	# Identifying as Not Full-Fledged	# with Missing Data	Response Rate	Full-Fledged as % of all BEST districts	Full-Fledged as % of Responding Districts
2017-18	163	67	11	85	52%	41%	86%
2018-19	174	45	13	116	67%	26%	78%
2019-20	197	74	25	98	50%	38%	75%

Appendix E: Logistic Regression Results for Retention & Mobility of Teachers: Statewide Stayers												

Fixed Effects	2015-2016 (2-level Model)				Predicted Probability		2016-2017 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower
Intercept	1.16	(0.05)	(247)	<.001 ***	0.76	0.76	1.13	(0.05)	(246)	<.001 ***	0.76	0.76
School Poverty (FRPL %)	-0.17	(0.02)	(54480)	<.001 ***	0.73	0.79	-0.12	(0.02)	(55636)	<.001 ***	0.73	0.78
Total District Enrollment	-0.07	(0.02)	(54480)	.102	0.75	0.75	-0.08	(0.05)	(55636)	.103	0.74	0.76
Grade Level (1 = Middle School)	-0.03	(0.03)	(54480)	.186	0.76	0.74	-0.11	(0.02)	(55636)	<.001 ***	0.74	0.74
Grade Level (1 = High School)	0.13	(0.02)	(54480)	<.001 ***	0.78	0.74	0.17	(0.02)	(55636)	<.001 ***	0.79	0.74
Employment Status (1 = Full time)	0.44	(0.05)	(54480)	<.001 ***	0.83	0.67	0.40	(0.02)	(55636)	<.001 ***	0.82	0.67
Experience (1 = Beginning teacher)	-0.19	(0.05)	(54480)	<.001 ***	0.72	0.79	-0.23	(0.02)	(55636)	<.001 ***	0.71	0.80
Random Effects	Var						Var					
1stPrimaryDistrict	0.10						0.10					
Model Information												
AIC	51793						51793					

Fixed Effects	2017-2018 (2-level Model)				Predicted Probability		2018-2019 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower
Intercept	1.16	(0.05)	(252)	<.001 ***	0.76	0.76	1.07	(0.06)	(247)	<.001 ***	0.74	0.74
School Poverty (FRPL %)	-0.17	(0.02)	(55636)	<.001 ***	0.73	0.79	-0.17	(0.02)	(57436)	<.001 ***	0.71	0.78
Total District Enrollment	-0.01	(0.05)	(55636)	.103	0.76	0.74	-0.02	(0.06)	(57436)	.715	0.74	0.74
Grade Level (1 = Middle School)	-0.04	(0.02)	(55636)	<.05 *	0.75	0.73	-0.14	(0.02)	(57436)	<.001 ***	0.72	0.73
Grade Level (1 = High School)	0.19	(0.02)	(55636)	<.001 ***	0.79	0.73	0.20	(0.02)	(57436)	<.001 ***	0.78	0.73
Employment Status (1 = Full time)	0.45	(0.02)	(55636)	<.001 ***	0.83	0.67	0.49	(0.02)	(57436)	<.001 ***	0.83	0.64
Experience (1 = Beginning teacher)	-0.17	(0.02)	(55636)	<.001 ***	0.73	0.79	-0.38	(0.02)	(57436)	<.001 ***	0.67	0.81
Random Effects	Var						Var					
1stPrimaryDistrict	0.31						0.10					
Model Information												
AIC	12051						51793					

*p < .05, ** p < .01, *** p < .001.

Note. N = 54,734 teachers within 248 districts (2015-2016), 55,889 teachers within 247 districts (2016-2017), 57,421 teachers within 253 districts (2017-2018), 57,600 teachers within 248 districts (2018-2019);Teacher's retention & mobility status are dummy coded (with Stayer=1, Others=0); Four school levels were effect coded (with Elementary School = -1); Teacher's experience was effect coded (with beginning teacher = 1, other teachers = -1); Poverty level (Free Reduced-Priced Lunch %) and district enrollment is z-scored. R lme4 package used to estimate models.

	Appendix F: Logistic Regression Results for Retention & Mobility of Teachers: Statewide Movers-in within Non-stayers											

Fixed Effects	2015-2016 (2-level Model)				Predicted Probability		2016-2017 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower
Intercept	-0.87	(0.08)	(228)	<.001 ***	0.30	0.30	-0.66	(0.08)	(230)	<.001 ***	0.34	0.34
School Poverty (FRPL %)	0.06	(0.03)	(8808)	.084	0.31	0.28	0.02	(0.03)	(9008)	.550	0.35	0.34
Total District Enrollment	0.27	(0.08)	(8808)	<.001 ***	0.36	0.29	0.32	(0.08)	(9008)	<.001 ***	0.42	0.29
Grade Level (1 = Middle School)	0.06	(0.04)	(8808)	.117	0.31	0.35	0.17	(0.04)	(9008)	<.001 ***	0.38	0.36
Grade Level (1 = High School)	-0.32	(0.04)	(8808)	<.001 ***	0.23	0.35	-0.24	(0.04)	(9008)	<.001 ***	0.29	0.36
Employment Status (1 = Full time)	0.09	(0.04)	(8808)	<.05 *	0.31	0.28	0.11	(0.04)	(9008)	<.01 **	0.37	0.32
Experience (1 = Beginning teacher)	-0.13	(0.04)	(8808)	<.01 **	0.27	0.32	-0.01	(0.04)	(9008)	.724	0.34	0.34
Random Effects	Var						Var					
District ID	0.27						0.26					
Model Information												
AIC	11462						11851					

Fixed Effects	2017-2018 (2-level Model)				Predicted Probability		2018-2019 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower
Intercept	-0.88	(0.08)	(241)	<.001 ***	0.29	0.29	-0.75	(0.09)	(229)	<.001 ***	0.32	0.32
School Poverty (FRPL %)	0.09	(0.03)	(9384)	<.01 **	0.31	0.27	-0.03	(0.03)	(8385)	.459	0.32	0.33
Total District Enrollment	0.33	(0.08)	(9384)	<.001 ***	0.37	0.29	0.29	(0.09)	(8385)	<.01 **	0.39	0.31
Grade Level (1 = Middle School)	-0.01	(0.04)	(9384)	.893	0.29	0.36	0.08	(0.04)	(8385)	<.05 *	0.34	0.38
Grade Level (1 = High School)	-0.29	(0.41)	(9384)	<.001 ***	0.24	0.36	-0.32	(0.04)	(8385)	<.001 ***	0.26	0.38
Employment Status (1 = Full time)	0.07	(0.04)	(9384)	.051	0.31	0.28	0.20	(0.04)	(8385)	<.001 ***	0.37	0.28
Experience (1 = Beginning teacher)	-0.12	(0.04)	(9384)	<.01 **	0.27	0.32	-0.03	(0.04)	(8385)	.397	0.31	0.33
Random Effects	Var						Var					
District ID	0.31						0.43					
Model Information												
AIC	12051						11054					

*p < .05, ** p < .01, *** p < .001.

Note. N = 9043 teachers within 229 districts (2015-2016), 9245 teachers within 231 districts (2016-2017), 9632 teachers within 242 districts (2017-2018), 8621 teachers within 230 districts (2018-2019);Teacher's retention & mobility status are dummy coded (with Mover-in = 1, Others = 0); Three school levels were effect coded (with Elementary School = -1); Teacher's experience was effect coded(with beginning teacher = 1, other teachers = -1); Poverty level (Free Reduced-Priced Lunch %) and district enrollment is z-scored. R lme4 package used to estimate models.

Appendix G: Logistic Regression Results for Retention & Mobility of Teachers: Statewide Movers Out within Non-stayers												

Fixed Effects	2015-2016 (2-level Model)				Predicted Probability		2016-2017 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower
Intercept	-1.27	(0.09)	(228)	<.001 ***	0.22	0.22	-1.61	(0.08)	(230)	<.001 ***	0.17	0.17
School Poverty (FRPL %)	0.08	(0.04)	(8808)	<.05 *	0.23	0.21	0.10	(0.04)	(9008)	<.01 **	0.18	0.15
Total District Enrollment	-0.23	(0.08)	(8808)	<.01 **	0.18	0.24	-0.27	(0.06)	(9008)	<.001 ***	0.13	0.20
Grade Level (1 = Middle School)	0.02	(0.05)	(8808)	.667	0.22	0.20	-0.05	(0.05)	(9008)	.295	0.16	0.16
Grade Level (1 = High School)	0.10	(0.04)	(8808)	<.05 *	0.24	0.20	0.08	(0.04)	(9008)	.061	0.18	0.16
Employment Status (1 = Full time)	0.30	(0.05)	(8808)	<.001 ***	0.27	0.17	0.31	(0.05)	(9008)	<.001 ***	0.21	0.13
Experience (1 = Beginning teacher)	0.29	(0.04)	(8808)	<.001 ***	0.27	0.17	0.05	(0.05)	(9008)	.286	0.17	0.16
Random Effects	Var						Var					
District ID	0.30						0.15					
Model Information												
AIC	9334						9209					

Fixed Effects	2017-2018 (2-level Model)				Predicted Probability		2018-2019 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower
Intercept	-1.39	(0.08)	(241)	<.001 ***	0.20	0.20	-1.76	(0.08)	(229)	<.001 ***	0.15	0.15
School Poverty (FRPL %)	0.13	(0.04)	(9384)	<.001 ***	0.22	0.18	0.05	(0.04)	(8385)	.233	0.15	0.14
Total District Enrollment	-0.22	(0.07)	(9384)	<.01 **	0.17	0.21	-0.19	(0.07)	(8385)	<.01 **	0.12	0.15
Grade Level (1 = Middle School)	0.04	(0.04)	(9384)	.359	0.21	0.18	0.02	(0.05)	(8385)	.699	0.15	0.12
Grade Level (1 = High School)	0.11	(0.04)	(9384)	<.05 *	0.22	0.18	0.19	(0.05)	(8385)	<.001 ***	0.17	0.12
Employment Status (1 = Full time)	0.39	(0.05)	(9384)	<.001 ***	0.27	0.14	0.28	(0.05)	(8385)	<.001 ***	0.19	0.12
Experience (1 = Beginning teacher)	0.20	(0.04)	(9384)	<.001 ***	0.23	0.17	0.09	(0.05)	(8385)	<.05 *	0.16	0.14
Random Effects	Var						Var					
District ID	0.20						0.19					
Model Information												
AIC	9988						7638					

Note. N = 9,043 teachers within 229 districts (2015-2016), 9245 teachers within 231 districts (2016-2017), 9632 teachers within 242 districts (2017-2018), 8621 teachers within 230 districts (2018-2019);Teacher's retention & mobility status are dummy coded (with Mover-out = 1, Others = 0); Three school levels were effect coded (with Elementary School = -1); Teacher's experience was effect coded(with beginning teacher = 1, other teachers = -1); Poverty level (Free Reduced-Priced Lunch %) and district enrollment is z-scored. R lme4 package used to estimate models.

Appendix H: Logistic Regression Results for Retention & Mobility of Teachers: Statewide Exiters within Non-stayers

Fixed Effects	2015-2016 (2-level Model)				Predicted Probability		2016-2017 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower
Intercept	-0.23	(0.05)	(228)	<.001 ***	0.44	0.44	-0.14	(0.06)	(230)	<.05 *	0.46	0.46
School Poverty (FRPL %)	-0.10	(0.03)	(8808)	<.001 ***	0.42	0.47	-0.06	(0.03)	(9008)	<.05 *	0.45	0.48
Total District Enrollment	-0.02	(0.04)	(8808)	.653	0.44	0.41	-0.06	(0.05)	(9008)	.253	0.45	0.47
Grade Level (1 = Middle School)	-0.06	(0.04)	(8808)	.128	0.43	0.41	-0.13	(0.04)	(9008)	<.001 ***	0.43	0.45
Grade Level (1 = High School)	0.21	(0.04)	(8808)	<.001 ***	0.50	0.41	0.17	(0.04)	(9008)	<.001 ***	0.51	0.45
Employment Status (1 = Full time)	-0.26	(0.03)	(8808)	<.001 ***	0.38	0.51	-0.28	(0.03)	(9008)	<.001 ***	0.40	0.53
Experience (1 = Beginning teacher)	-0.12	(0.04)	(8808)	<.01 **	0.41	0.47	-0.02	(0.04)	(9008)	.618	0.46	0.47
Random Effects	Var						Var					
District ID	0.05						0.11					
Model Information												
AIC	12044						12262					

Fixed Effects	2017-2018 (2-level Model)				Predicted Probability		2018-2019 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower	Coeff	(SE)	(df)	p	1 SD higher	1 SD lower
Intercept	-0.14	(0.06)	(241)	.065	0.47	0.47	0.01	(0.07)	(229)	.858	0.50	0.50
School Poverty (FRPL %)	-0.18	(0.03)	(9384)	<.001 ***	0.42	0.51	-0.01	(0.03)	(8385)	.792	0.50	0.50
Total District Enrollment	-0.10	(0.05)	(9384)	.062	0.44	0.45	-0.10	(0.07)	(8385)	.153	0.48	0.50
Grade Level (1 = Middle School)	-0.01	(0.04)	(9384)	.821	0.46	0.42	-0.07	(0.04)	(8385)	.062	0.48	0.47
Grade Level (1 = High School)	0.18	(0.04)	(9384)	<.001 ***	0.51	0.42	0.18	(0.04)	(8385)	<.001 ***	0.55	0.47
Employment Status (1 = Full time)	-0.29	(0.03)	(9384)	<.001 ***	0.40	0.54	-0.32	(0.04)	(8385)	<.001 ***	0.42	0.58
Experience (1 = Beginning teacher)	-0.05	(0.04)	(9384)	.181	0.45	0.48	-0.02	(0.04)	(8385)	.514	0.50	0.51
Random Effects	Var						Var					
District ID	0.11						0.19					
Model Information												
AIC	12677						11482					

* p < .05, ** p < .01, *** p < .001.
Note. N = 9043 teachers within 229 districts (2015-2016), 9245 teachers within 231 districts (2016-2017), 9632 teachers within 242 districts (2017-2018), 8621 teachers within 230 districts (2018-2019);Teacher's retention & mobility status are dummy coded (with Mover-out = 1, Others = 0); Three school levels were effect coded (with Elementary School = -1); Teacher's experience was effect coded(with beginning teacher = 1, other teachers = -1); Poverty level (Free Reduced-Priced Lunch %) and district enrollment is z-scored. R lme4 package used to estimate models.

Appendix I: Logistic Regression Results for Retention and Mobility of Teachers: Beginning Teacher Stayers vs. Non-Stayers												

Fixed Effects	2015-2016 (2-level Model)				Predicted Probability		2016-2017 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	0.86	(0.07)	(199)	<.001 ***	0.70	0.70	0.89	(0.08)	(196)	<.001 ***	0.71	0.71
School Poverty (FRL%)	-0.09	(0.05)	(3226)	.076	0.68	0.72	0.01	(0.05)	(3157)	.777	0.71	0.71
Grade Level (Middle School = 1)	-0.12	(0.07)	(3226)	.093	0.68	0.68	-0.13	(0.07)	(3157)	.082	0.68	0.70
Grade Level (High School =1)	0.23	(0.07)	(3226)	.002 **	**0.75**	**0.68**	0.18	(0.07)	(3157)	.009 **	**0.75**	**0.70**
Teacher Status (Full time = 1)	0.50	(0.06)	(3226)	<.001 ***	**0.80**	**0.59**	0.38	(0.06)	(3157)	<.001 ***	**0.78**	**0.62**
District Size	0.03	(0.06)	(3226)	.623	0.71	0.70	-0.05	(0.07)	(3157)	.438	0.70	0.72
BEST District (Yes = 1)	-0.04	(0.05)	(3226)	.427	0.69	0.71	-0.04	(0.06)	(3157)	.512	0.70	0.72
Random Effects	Var						Var					
District ID	0.06						0.10					
Model Information												
AIC	3695						3720					

Note. N = 3432 teachers within 200 districts (2015-16).Across all years, teacher's retention & mobility status are dummy coded (with Stayers=1, Others=0); Three school grade levels were effect coded, with elementary school as reference group; Teacher status and BEST district are effect-coded; Poverty level and district size are z-scored. R lme4 package used to estimate models.

Note. N = 3360 teachers within 197 districts (2016-17).

Fixed Effects	2017-2018 (2-level Model)				Predicted Probability		2018-2019 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	0.81	(0.07)	(213)	<.001 ***	0.69	0.69	0.59	(0.09)	(207)	<.001 ***	0.64	0.64
School Poverty (FRL%)	-0.09	(0.05)	(3114)	.063	0.67	0.71	-0.12	(0.05)	(3254)	.023	0.61	0.67
Grade Level (Middle School = 1)	-0.21	(0.07)	(3114)	.004 **	**0.65**	**0.70**	-0.11	(0.07)	(3254)	.112	**0.62**	**0.63**
Grade Level (High School =1)	0.15	(0.07)	(3114)	.040 *	**0.72**	**0.70**	0.17	(0.07)	(3254)	.012 *	**0.68**	**0.63**
Teacher Status (Full time = 1)	0.49	(0.06)	(3114)	<.001 ***	**0.79**	**0.58**	0.52	(0.06)	(3254)	<.001 ***	0.75	0.52
District Size	0.07	(0.06)	(3114)	.243	0.71	0.68	-0.10	(0.11)	(3254)	.339	0.62	0.67
BEST & Full-fledged (Yes = 1)	-0.04	(0.06)	(3114)	.418	0.68	0.70	0.02	(0.08)	(3254)	.821	0.65	0.64
Random Effects	Var						Var					
District ID	0.05						0.27					
Model Information												
AIC	3582						3974					

Note. N = 3334 teachers within 214 districts (2017-18).

Note. N = 3468 teachers within 208 districts (2018-19).

* p < .05, ** p < .01, *** p < .001.

Appendix J: Logistic Regression Results for Retention & Mobility of Teachers: Beginning Teacher Movers-in vs. Others within Non-stayers												

Fixed Effects	2015-2016 (2-level Model)				Predicted Probability		2016-2017 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-0.94	(0.13)	(141)	<.001 ***	0.28	0.28	-0.50	(0.15)	(144)	<.001 ***	0.38	0.38
School Poverty (FRL%)	-0.11	(0.10)	(668)	.260	0.26	0.30	-0.05	(0.10)	(681)	.639	0.37	0.39
Grade Level (Middle School = 1)	0.06	(0.15)	(668)	.690	0.29	0.38	0.10	(0.14)	(681)	.443	0.40	0.40
Grade Level (High School =1)	-0.51	(0.16)	(668)	.001 **	**0.19**	**0.38**	-0.21	(0.14)	(681)	.121	0.33	0.40
Teacher Status (Full time = 1)	-0.21	(0.11)	(668)	.048 *	**0.24**	**0.33**	-0.11	(0.10)	(681)	.282	0.35	0.40
District Size	0.27	(0.12)	(668)	.029 *	**0.34**	**0.23**	0.27	(0.14)	(681)	.045 *	**0.44**	**0.32**
BEST District (Yes = 1)	0.04	(0.11)	(668)	.754	0.29	0.27	-0.05	(0.12)	(681)	.679	0.37	0.39
Random Effects	Var						Var					
District ID	0.32						0.37					
Model Information												
AIC	988						1092					

Note. N = 816 teachers within 142 districts (2015-16). Across all years, teacher's retention & mobility status are dummy coded (with Movers-in=1, Others=0); Three school grade levels were effect coded, with elementary school as reference group; Teacher status and BEST district are effect-coded; Poverty level and district size are z-scored. R lme4 package used to estimate models.

Note. N = 832 teachers within 145 districts (2016-17).

Fixed Effects	2017-2018 (2-level Model)				Predicted Probability		2018-2019 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-0.84	(0.12)	(151)	<.001 ***	0.30	0.30	-0.78	(0.13)	(145)	<.001 ***	0.31	0.31
School Poverty (FRL%)	0.00	(0.09)	(633)	.965	0.30	0.30	-0.08	(0.09)	(819)	.338	0.30	0.33
Grade Level (Middle School = 1)	-0.15	(0.14)	(633)	.254	0.27	0.33	0.12	(0.12)	(819)	.307	0.34	0.37
Grade Level (High School =1)	0.03	(0.14)	(633)	.798	0.31	0.33	-0.35	(0.12)	(819)	.004 **	**0.24**	**0.37**
Teacher Status (Full time = 1)	-0.05	(0.10)	(633)	.625	0.29	0.31	0.25	(0.10)	(819)	.011 *	**0.37**	**0.26**
District Size	0.33	(0.11)	(633)	.004 **	**0.38**	**0.24**	0.40	(0.14)	(819)	.006 **	**0.41**	**0.24**
BEST & Full-fledged (Yes = 1)	-0.02	(0.11)	(633)	.831	0.30	0.31	-0.09	(0.12)	(819)	.445	0.30	0.33
Random Effects	Var						Var					
District ID	0.16						0.31					
Model Information												
AIC	974						1262					

Note. N = 791 teachers within 152 districts (2017-18).

Note. N = 971 teachers within 146 districts (2018-19).

* p < .05, ** p < .01, *** p < .001.

Fixed Effects	2015-2016 (2-level Model)				Predicted Probability		2016-2017 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-0.91	(0.12)	(141)	<.001 ***	0.29	0.29	-1.53	(0.17)	(144)	<.001 ***	0.18	0.18
School Poverty (FRL%)	0.09	(0.09)	(668)	.314	0.31	0.27	-0.10	(0.11)	(681)	.372	0.16	0.19
Grade Level (Middle School = 1)	0.15	(0.14)	(668)	.287	0.32	0.26	0.00	(0.16)	(681)	.978	0.18	0.17
Grade Level (High School =1)	-0.02	(0.14)	(668)	.862	0.28	0.26	0.03	(0.15)	(681)	.861	0.18	0.17
Teacher Status (Full time = 1)	0.31	(0.11)	(668)	.004 **	**0.35**	**0.23**	0.29	(0.13)	(681)	.029 *	**0.22**	**0.14**
District Size	-0.37	(0.10)	(668)	<.001 ***	**0.22**	**0.37**	-0.29	(0.13)	(681)	.027 *	**0.14**	**0.22**
BEST District (Yes = 1)	0.04	(0.09)	(668)	.698	0.29	0.28	-0.01	(0.12)	(681)	.910	0.18	0.18
Random Effects	Var						Var					
District ID	0.09						0.28					
Model Information												
AIC	1015						869					

Note. N = 816 teachers within 142 districts (2015-16). Across all years, teacher's retention & mobility status are dummy coded (with Movers-in=1, Others=0); Three school grade levels were effect coded, with elementary school as reference group; Teacher status and BEST district are effect-coded; Poverty level and district size are z-scored. R lme4 package used to estimate models.

Note. N = 832 teachers within 145 districts (2016-17).

Fixed Effects	2017-2018 (2-level Model)				Predicted Probability		2018-2019 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-1.20	(0.14)	(151)	<.001 ***	0.23	0.23	-1.46	(0.13)	(145)	<.001 ***	0.19	0.19
School Poverty (FRL%)	-0.07	(0.10)	(633)	.478	0.22	0.24	-0.06	(0.09)	(819)	.505	0.18	0.20
Grade Level (Middle School = 1)	-0.02	(0.14)	(633)	.909	0.23	0.24	0.14	(0.13)	(819)	.289	0.21	0.13
Grade Level (High School =1)	-0.05	(0.14)	(633)	.752	0.22	0.24	0.27	(0.13)	(819)	.044 *	**0.23**	**0.13**
Teacher Status (Full time = 1)	0.34	(0.12)	(633)	.004 **	**0.30**	**0.18**	0.04	(0.11)	(819)	.721	0.20	0.18
District Size	-0.42	(0.13)	(633)	.001 **	**0.17**	**0.31**	-0.37	(0.13)	(819)	.006 **	**0.14**	**0.25**
BEST & Full-fledged (Yes = 1)	0.10	(0.11)	(633)	.361	0.25	0.21	0.04	(0.11)	(819)	.739	0.19	0.18
Random Effects	Var						Var					
District ID	0.24						0.07					
Model Information												
AIC	945						919					

Note. N = 791 teachers within 152 districts (2017-18).

Note. N = 971 teachers within 146 districts (2018-19).

* p < .05, ** p < .01, *** p < .001.

Fixed Effects	2015-2016 (2-level Model)				Predicted Probability		2016-2017 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-0.40	(0.10)	(141)	<.001 ***	0.40	0.40	-0.36	(0.12)	(144)	<.001 ***	0.41	0.41
School Poverty (FRL%)	-0.02	(0.08)	(668)	.819	0.40	0.41	0.12	(0.09)	(681)	.163	0.44	0.38
Grade Level (Middle School = 1)	-0.13	(0.13)	(668)	.318	0.37	0.34	-0.09	(0.13)	(681)	.472	0.39	0.39
Grade Level (High School =1)	0.40	(0.13)	(668)	.001 **	**0.50**	**0.34**	0.18	(0.13)	(681)	.151	0.46	0.39
Teacher Status (Full time = 1)	-0.10	(0.09)	(668)	.279	0.38	0.43	-0.06	(0.10)	(681)	.540	0.40	0.43
District Size	0.15	(0.08)	(668)	.063	0.44	0.37	0.00	(0.10)	(681)	.989	0.41	0.41
BEST District (Yes = 1)	-0.05	(0.08)	(668)	.537	0.39	0.41	0.06	(0.10)	(681)	.518	0.43	0.40
Random Effects	Var						Var					
District ID	0.01						0.12					
Model Information												
AIC	1066						1131					

Note. N = 816 teachers within 142 districts (2015-16). Across all years, teacher's retention and mobility status are dummy coded (with Movers-in=1, Others=0); Three school grade levels were effect coded, with elementary school as reference group; Teacher status and BEST district are effect-coded; Poverty level and district size are z-scored. R lme4 package used to estimate models.

Note. N = 832 teachers within 145 districts (2016-17).

Fixed Effects	2017-2018 (2-level Model)				Predicted Probability		2018-2019 (2-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-0.25	(0.10)	(151)	.008 **	0.44	0.44	-0.13	(0.12)	(145)	.279	0.47	0.47
School Poverty (FRL%)	0.08	(0.08)	(633)	.325	0.46	0.42	0.12	(0.08)	(819)	.144	0.50	0.44
Grade Level (Middle School = 1)	0.15	(0.12)	(633)	.223	0.47	0.40	-0.19	(0.12)	(819)	.103	0.42	0.48
Grade Level (High School =1)	0.01	(0.12)	(633)	.963	0.44	0.40	0.13	(0.12)	(819)	.254	0.50	0.48
Teacher Status (Full time = 1)	-0.21	(0.09)	(633)	.029 *	**0.39**	**0.49**	-0.27	(0.09)	(819)	.003 **	**0.40**	**0.54**
District Size	0.04	(0.08)	(633)	.676	0.45	0.43	-0.19	(0.14)	(819)	.163	0.42	0.52
BEST & Full-fledged (Yes = 1)	-0.05	(0.09)	(633)	.559	0.42	0.45	0.09	(0.11)	(819)	.419	0.49	0.45
Random Effects	Var						Var					
District ID	0.00						0.29					
Model Information												
AIC	1067						1312					

Note. N = 791 teachers within 152 districts (2017-18).

Note. N = 971 teachers within 146 districts (2018-19).

* p < .05, ** p < .01, *** p < .001.

	2016-17		2017-18		2018-19		2019-20	
Appendix M: Mentor Model Type by Districts in Consortia and Districts not in Consortia								
	Consortia Districts	Non-Consorita Districts	Consortia Districts	Non-Consorita Districts	Consortia Districts	Non-Consorita Districts	Districts in Consortia	Non-Consorita Districts
Number of Districts	58	40	86	56	90	67	101	64
% Using Released Model	16%	50%	38%	46%	44%	43%	41%	53%
% Using Colleague Model	76%	30%	38%	45%	42%	25%	43%	22%
% Using Both Models	5%	15%	8%	25%	7%	31%	7%	22%
% Missing data	3%	5%	15%	2%	7%	0%	10%	3%

Teachers of Color	2015-16			2016-17			2017-18				2018/19				2019/20**			
	Statewide Teachers of Color	Statewide Beg Teachers of Color	BEST	Statewide Teachers of Color	Statewide Beg Teachers of Color	BEST	Statewide Teachers of Color	Statewide Beg Teachers of Color	BEST	Full-Fledged	Statewide Teachers of Color	Statewide Beg Teachers of Color	BEST	Full-Fledged	Statewide Teachers of Color	Statewide Beg Teachers of Color	BEST	Full-Fledged
# Teachers of Color	6,046	554	334	6,555	629	451	6,989	641	531	398	7,565	771	619	474	7850	610	526	386
Asian/Pacific Islander/Native Hawaiian	28.2%	23.6%	22.5%	28.1%	27.0%	25.9%	27.9%	23.4%	22.8%	25.1%	27.5%	25.4%	26.8%	31.0%	26.8%	22.8%	22.4%	28.0%
Black/African American	12.4%	10.5%	13.2%	12.3%	11.6%	12.6%	11.9%	12.2%	13.0%	14.1%	11.9%	14.0%	15.0%	17.1%	11.9%	14.1%	12.9%	15.0%
Hispanic/Latinx	38.7%	43.3%	40.4%	39.8%	44.4%	44.6%	40.6%	47.4%	47.6%	43.7%	41.7%	45.0%	43.1%	37.6%	42.4%	45.4%	45.8%	42.7%
Native American/Alaskan Native	6.8%	5.6%	4.5%	6.5%	5.1%	5.8%	6.3%	4.5%	4.1%	3.5%	6.0%	5.1%	3.9%	3.0%	5.7%	3.3%	3.6%	2.3%
Multiracial	13.9%	17.0%	19.5%	13.3%	11.9%	11.1%	13.2%	12.5%	12.4%	13.6%	12.9%	10.5%	11.1%	11.4%	13.2%	14.4%	15.2%	11.9%
Region of the State																		
Central Puget Sound (ESD 121)	50.0%	49.3%	53.9%	49.5%	50.6%	52.8%	49.1%	48.4%	52.2%	60.3%	49.4%	52.3%	56.9%	70.9%	50.5%	60.0%	59.5%	67.6%
Western WA (outside 121)	22.7%	21.5%	16.2%	23.4%	19.4%	17.1%	23.4%	21.4%	19.4%	16.6%	23.7%	22.6%	21.6%	16.2%	23.0%	20.7%	21.5%	18.1%
Eastern WA	27.3%	29.2%	29.9%	27.1%	30.0%	30.2%	27.6%	30.3%	28.4%	23.1%	26.9%	25.2%	21.5%	12.9%	26.4%	19.3%	19.0%	14.2%
District Total Student Enrollment																		
Fewer than 999	4.2%	6.7%	3.6%	4.2%	5.6%	3.1%	4.2%	5.3%	3.4%	0.3%	4.4%	7.9%	3.9%	0	4.3%	11.0%	5.7%	0.5%
1,000-4,999	14.0%	15.0%	16.8%	14.1%	14.6%	13.1%	14.6%	16.7%	13.7%	5.5%	14.4%	17.4%	14.4%	2.7%	14.9%	16.2%	16.5%	11.1%
5,000-9,999	13.7%	13.7%	3.3%	12.9%	11.3%	8.2%	13.3%	13.1%	9.6%	10.1%	13.0%	9.9%	8.2%	6.5%	11.1%	8.5%	8.0%	7.3%
10,000-19,999	28.4%	26.5%	29.0%	27.0%	29.9%	34.4%	27.6%	28.9%	33.5%	40.2%	25.6%	24.8%	27.6%	33.3%	27.2%	22.8%	23.6%	29.5%
20,000+	39.6%	38.1%	47.3%	41.7%	37.8%	41.2%	40.3%	36.0%	39.7%	44.0%	42.5%	39.8%	45.9%	57.4%	42.4%	41.0%	46.2%	51.6%
School Level																		
Elementary	51.9%	58.1%	59.9%	52.6%	55.5%	55.0%	52.9%	57.9%	58.4%	58.5%	51.6%	52.7%	54.0%	55.5%	50.7%	48.0%	50.8%	52.1%
Middle School	18.2%	16.4%	17.1%	17.1%	16.9%	16.9%	17.1%	15.0%	15.8%	17.1%	17.1%	16.0%	16.0%	15.4%	17.2%	15.9%	16.9%	17.1%
High School	24.1%	20.0%	20.4%	23.3%	19.9%	20.8%	23.3%	20.1%	19.2%	18.1%	22.1%	20.2%	20.4%	20.3%	21.8%	20.2%	19.8%	18.9%
Other (e.g., PK-8, 1-8, 6-12)	3.9%	2.5%	2.4%	5.4%	5.7%	5.8%	5.5%	5.9%	5.5%	4.8%	5.1%	5.2%	4.7%	2.7%	5.5%	5.6%	4.9%	4.1%
Missing	2.0%	2.9%	0.3%	1.5%	2.1%	1.6%	1.2%	1.1%	1.1%	1.5%	4.1%	6.0%	5.0%	6.1%	4.9%	10.3%	7.6%	7.8%
Poverty of School																		
0-25% FRPL	17.0%	14.1%	10.2%	17.8%	16.4%	13.5%	19.1%	15.4%	13.9%	12.3%	17.0%	14.3%	13.2%	15.2%	17.3%	14.4%	13.5%	17.4%
26-49% FRPL	25.6%	21.7%	18.9%	25.7%	18.3%	15.1%	25.2%	22.6%	22.8%	20.6%	23.3%	22.0%	22.1%	19.4%	23.2%	21.0%	22.4%	23.1%
50-74% FRPL	30.5%	32.1%	36.2%	31.5%	32.8%	36.6%	29.6%	34.6%	37.3%	43.2%	29.8%	29.7%	29.7%	31.6%	33.5%	36.2%	35.9%	34.7%
75+% FRPL	24.9%	29.2%	34.4%	23.4%	30.5%	33.3%	24.8%	26.2%	24.9%	22.4%	28.8%	32.3%	33.1%	31.9%	24.6%	25.6%	27.0%	23.6%
Unidentified	2.0%	2.9%	0.3%	1.5%	2.1%	1.6%	1.2%	1.1%	1.1%	1.5%	1.1%	1.7%	1.8%	1.9%	1.4%	2.8%	1.1%	1.3%
Student Race/Ethnicity																		
0-25% Students of Color	10.4%	7.9%	6.9%	9.1%	5.4%	4.7%	7.9%	4.7%	4.0%	3.3%	7.1%	6.2%	6.0%	3.0%	4.7%	3.4%	3.0%	1.8%
26-49% Students of Color	31.1%	26.2%	21.6%	30.4%	23.8%	20.2%	29.4%	25.3%	23.7%	21.4%	28.3%	26.3%	25.7%	20.3%	22.1%	20.7%	20.5%	21.0%
50-74% Students of Color	26.1%	27.4%	25.1%	28.9%	27.5%	27.5%	30.1%	29.8%	33.7%	34.4%	31.0%	28.3%	28.9%	36.3%	29.0%	30.5%	30.6%	36.3%
75+% Students of Color	30.4%	35.6%	46.1%	30.1%	41.2%	46.1%	31.3%	39.2%	39.2%	39.4%	32.3%	37.5%	37.6%	38.6%	30.5%	32.8%	33.8%	32.6%
Unidentified	2.0%	2.9%	0.3%	1.5%	2.1%	1.6%	1.2%	1.1%	1.1%	1.5%	1.2%	1.7%	1.8%	1.9%	13.7%	12.6%	12.0%	8.3%

Notes: *Duty root 31, 32, 33 or 34 with FTE designation >0. Beginning teachers is based on teachers with less than one year of experience.

**Based on preliminary data which does not include some programmed fields.

Percentages may not add up to exactly 100% due to rounding.

*Includes institutions like districts, charter schools and other state agencies

Appendix O: Ten WA Districts with Largest Enrollments of Students of Color by Race/Ethnic Group: 2019-20

Rank Order*	Black/African American	Hispanic/Latinx	Native American or Alaskan Native	Asian	Hawaiian or Other Pacific Islander	Multiracial
1	Seattle	Pasco	Keller	Bellevue	Federal Way	Seattle
2	Tacoma	Yakima	Muckleshoot Tribal Agency	Lake Washington	Tacoma	Tacoma
3	Federal Way	Highline	Nespelem	Issaquah	Bethel	Spokane
4	Kent	Federal Way	Lummi Tribal Agency	Tukwila	Auburn	Bethel
5	Highline	Seattle	Inchelium	Renton	Clover Park	Puyallup
6	Renton	Kennewick	Chief Leschi Schools	Mercer Island	Highline	Kent
7	Clover Park	Tacoma	Taholah	Northshore	Kent	Lake Washington
8	Edmonds	Vancouver	WA HE LUT Indian School Agency	Kent	Spokane	Federal Way
9	Auburn	Evergreen	Wellpinit	Everett	Vancouver	North Thurston
10	Bethel	Sunnyside	Queets-Clearwater	Highline	Evergreen (Clark)	Edmonds

Rank order based on the ten districts with the largest total enrollment of students of color in this race/ethnic group.

Appendix P1: Teacher Retention and Mobility Comparison by Race/Ethnicity: 2015-16 to 2016-17									
	Number Teachers	Stayers in School		Movers in District		Movers out District		Exiters from WA system	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Statewide White	53,968	44,828	83%	3,378	6%	2,049	4%	3,713	7%
Statewide White Beginning	3,191	2,399	75%	250	8%	249	8%	293	9%
BEST White	1,661	1,248	75%	136	8%	121	7%	156	9%
Full-fledged White	NA	NA		NA		NA		NA	
Statewide Teachers of Color	6,046	4995	83%	384	6%	271	4%	396	7%
Statewide Beginning Teachers of Color	554	432	78%	36	6%	38	7%	48	9%
BEST TOCs	334	262	78%	23	7%	28	8%	21	6%
Full-Fledged TOCs	NA	NA		NA		NA		NA	
Asian/Pacific Islander/Native Hawaiian									
Statewide	1707	1408	82%	112	7%	72	4%	115	7%
Beginning	131	101	77%	6	5%	8	6%	16	12%
BEST	75	61	81%	3	4%	4	5%	7	9%
Full-Fledged	NA	NA		NA		NA		NA	
Black/African American									
Statewide	747	589	79%	49	7%	43	6%	66	9%
Beginning	58	40	69%	6	10%	7	12%	5	9%
BEST	44	33	75%	5	11%	4	9%	2	5%
Full-Fledged	NA	NA		NA		NA		NA	
Hispanic									
Statewide	2341	1968	84%	141	6%	102	4%	130	6%
Beginning	240	193	80%	14	6%	17	7%	16	7%
BEST	135	103	76%	10	7%	15	11%	7	5%
Full-Fledged	NA	NA		NA		NA		NA	
Native American/Alaskan Native									
Statewide	409	343	84%	30	7%	11	3%	25	6%
Beginning	31	21	68%	5	16%	0	0%	5	16%
BEST	15	11	73%	2	13%	0	0%	2	13%
Full-Fledged	NA	NA		NA		NA		NA	
More than one race									
Statewide	842	687	82%	52	6%	43	5%	60	7%
Beginning	94	77	82%	5	5%	6	6%	6	6%
BEST	65	54	83%	3	5%	5	8%	3	5%
Full-Fledged	NA	NA		NA		NA		NA	

	Number Teachers	Stayers in School		Movers in District		Movers out District		Exiters from WA system	
Appendix P2: Teacher Retention and Mobility Comparison by Race/Ethnicity: 2016-17 to 2017-18									
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Statewide White	55,031	45,799	83%	3,528	6%	1,913	3%	3,791	7%
Statewide White Beginning	3,071	2,284	74%	299	10%	177	6%	311	10%
BEST White	2,138	1,578	74%	212	10%	119	6%	229	11%
Full-fledged White	NA	NA		NA		NA		NA	
Statewide Teachers of Color	6,555	5387	82%	449	7%	252	4%	467	7%
Statewide Beginning Teachers of Color	629	475	76%	50	8%	30	5%	74	12%
BEST TOCs	451	333	74%	39	9%	20	4%	59	13%
Full-Fledged TOCs	NA	NA		NA		NA		NA	
Asian/Pacific Islander/Native Hawaiian									
Statewide	1842	1521	83%	139	8%	59	3%	123	7%
Beginning	170	123	72%	12	7%	11	6%	24	14%
BEST	117	82	70%	8	7%	10	9%	17	15%
Full-Fledged	NA	NA		NA		NA		NA	
Black/African American									
Statewide	804	633	79%	63	8%	39	5%	69	9%
Beginning	73	48	66%	11	15%	3	4%	11	15%
BEST	57	38	67%	10	18%	0	0%	9	16%
Full-Fledged	NA	NA		NA		NA		NA	
Hispanic									
Statewide	2607	2169	83%	151	6%	101	4%	186	7%
Beginning	279	226	81%	17	6%	9	3%	27	10%
BEST	201	162	81%	12	6%	4	2%	23	11%
Full-Fledged	NA	NA		NA		NA		NA	
Native American/Alaskan Native									
Statewide	429	348	81%	33	8%	16	4%	32	7%
Beginning	32	21	66%	5	16%	2	6%	4	13%
BEST	26	16	62%	5	19%	2	8%	3	12%
Full-Fledged	NA	NA		NA		NA		NA	
More than one race									
Statewide	873	716	82%	63	7%	37	4%	57	7%
Beginning	75	57	76%	5	7%	5	7%	8	11%
BEST	50	35	70%	4	8%	4	8%	7	14%
Full-Fledged	NA	NA		NA		NA		NA	

	Number Teachers	Stayers in School		Movers in District		Movers out District		Exiters from WA system	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Statewide White	55,968	46,473	83%	3,432	6%	2,179	4%	3,884	7%
Statewide White Beginning	3,022	2,282	76%	221	7%	221	7%	298	10%
BEST White	2,448	1,839	75%	185	8%	185	8%	239	10%
Full-fledged White	1,828	1,392	76%	139	8%	125	7%	172	9%
Statewide Teachers of Color	6,989	5689	81%	514	7%	313	4%	473	7%
Statewide Beginning Teachers of Color	641	492	77%	50	8%	44	7%	55	9%
BEST TOCs	531	402	76%	44	8%	37	7%	48	9%
Full-Fledged TOCs	398	295	74%	34	9%	30	8%	39	10%
Asian/Pacific Islander/Native Hawaiian									
Statewide	1948	1583	81%	131	7%	81	4%	153	8%
Beginning	150	106	71%	13	9%	16	11%	15	10%
BEST	121	85	70%	12	10%	12	10%	12	10%
Full-Fledged	100	69	69%	9	9%	12	12%	10	10%
Black/African American									
Statewide	834	665	80%	58	7%	38	5%	73	9%
Beginning	78	55	71%	9	12%	6	8%	8	10%
BEST	69	49	71%	7	10%	5	7%	8	12%
Full-Fledged	56	39	70%	6	11%	5	9%	6	11%
Hispanic									
Statewide	2841	2336	82%	230	8%	124	4%	151	5%
Beginning	304	243	80%	27	9%	11	4%	23	8%
BEST	253	197	78%	25	10%	11	4%	20	8%
Full-Fledged	174	133	76%	19	11%	7	4%	15	9%
Native American/Alaskan Native									
Statewide	443	360	81%	29	7%	20	5%	34	8%
Beginning	29	26	90%	0	0%	2	7%	1	3%
BEST	22	19	86%	0	0%	2	9%	1	5%
Full-Fledged	14	13	93%	0	0%	0	0%	1	7%
More than one race									
Statewide	923	745	81%	66	7%	50	5%	62	7%
Beginning	80	62	78%	1	1%	9	11%	8	10%
BEST	66	52	79%	0	0%	7	11%	7	11%
Full-Fledged	54	41	76%	0	0%	6	11%	7	13%

Appendix P3: Teacher Retention and Mobility Comparison by Race/Ethnicity: 2017-18 to 2018-19

	Number Teachers	Stayers in School		Movers in District		Movers out District		Exiters from WA system	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Statewide White	56,971	48,358	85%	3466	6%	1438	3%	3709	7%
Statewide White Beginning	3,160	2,264	72%	327	10%	180	6%	389	12%
BEST White	2,465	1,769	72%	271	11%	130	5%	295	12%
Full-fledged White	1,694	1,230	73%	183	11%	82	5%	199	12%
Statewide Teachers of Color	7565	6280	83%	503	7%	222	3%	560	7%
Statewide Beginning Teachers of Color	771	559	73%	78	10%	28	4%	106	14%
BEST TOCs	619	450	73%	69	11%	20	3%	80	13%
Full-Fledged TOCs	474	341	72%	57	12%	13	3%	63	13%
Asian/Pacific Islander/Native Hawaiian									
Statewide	2080	1737	84%	133	6%	49	2%	161	8%
Beginning	196	143	73%	22	11%	6	3%	25	13%
BEST	166	121	73%	21	13%	4	2%	20	12%
Full-Fledged	147	107	73%	19	13%	3	2%	18	12%
Black/African American									
Statewide	902	710	79%	60	7%	35	4%	97	11%
Beginning	108	72	67%	13	12%	3	3%	20	19%
BEST	93	63	68%	12	13%	2	2%	16	17%
Full-Fledged	81	56	69%	10	12%	2	2%	13	16%
Hispanic									
Statewide	3155	2655	84%	214	7%	85	3%	201	6%
Beginning	347	255	73%	35	10%	14	4%	43	12%
BEST	267	195	73%	29	11%	11	4%	32	12%
Full-Fledged	178	125	70%	22	12%	7	4%	24	13%
Native American/Alaskan Native									
Statewide	452	369	82%	29	6%	15	3%	39	9%
Beginning	39	29	74%	2	5%	1	3%	7	18%
BEST	24	19	79%	2	8%	1	4%	2	8%
Full-Fledged	14	11	79%	2	14%	0	0%	1	7%
More than one race									
Statewide	976	809	83%	67	7%	38	4%	62	6%
Beginning	81	60	74%	6	7%	4	5%	11	14%
BEST	69	52	75%	5	7%	2	3%	10	14%
Full-Fledged	54	42	78%	4	7%	1	2%	7	13%

Appendix P4: Teacher Retention and Mobility Comparison by Race/Ethnicity: 2018-19 to 2019-20

Appendix Q1: Logistic Regression Results for Retention and Mobility of Beginning Teachers of Color: Beginning Teachers of Color Stayers vs. Non-Stayers

Fixed Effects	2015-2016 (1-level Model)				Predicted Probability		2016-2017 (1-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	1.04	(0.20)	(496)	<.001 ***	0.74	0.74	0.69	(0.17)	(543)	<.001 ***	0.67	0.67
School Poverty (FRL%)	0.08	(0.12)	(495)	.523	0.75	0.72	-0.03	(0.12)	(542)	.799	0.66	0.67
Grade Level (Middle School = 1)	-0.25	(0.20)	(494)	.202	0.69	0.74	-0.03	(0.18)	(541)	.883	0.66	0.68
Grade Level (High School =1)	0.25	(0.20)	(493)	.213	0.78	0.74	-0.05	(0.18)	(540)	.790	0.66	0.68
Teacher Status (Full time = 1)	0.33	(0.20)	(492)	.089	0.80	0.67	0.56	(0.16)	(539)	<.001 ***	**0.78**	**0.53**
District Size	0.08	(0.12)	(491)	.523	0.75	0.72	-0.10	(0.11)	(538)	.365	0.64	0.69
Ethnic (Asian/Pacific Islander =1)	0.19	(0.21)	(490)	.368	0.77	0.75	-0.18	(0.18)	(537)	.296	0.62	0.75
Ethnic (Black/African American =1)	-0.50	(0.25)	(489)	.046 *	**0.63**	**0.75**	-0.23	(0.24)	(536)	.333	0.61	0.75
Ethnic (More than 1 race =1)	0.25	(0.23)	(488)	.277	0.78	0.75	0.00	(0.24)	(535)	.990	0.67	0.75
Model Information												
AIC	511						575					

Note. N = 497 teachers (2015-2016);N = 544 teachers (2016-2017).

* *p* < .05, ** *p* < .01, *** *p* < .001.

Fixed Effects	2017-2018 (1-level Model)				Predicted Probability		2018-2019 (1-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	0.50	(0.17)	(556)	.003 **	0.62	0.62	0.54	(0.16)	(655)	<.001 ***	0.63	0.63
School Poverty (FRL%)	0.01	(0.12)	(555)	.961	0.62	0.62	-0.07	(0.10)	(654)	.498	0.62	0.65
Grade Level (Middle School = 1)	-0.19	(0.19)	(554)	.303	0.58	0.65	0.15	(0.17)	(653)	.372	0.67	0.59
Grade Level (High School =1)	0.09	(0.18)	(553)	.612	0.64	0.65	0.05	(0.16)	(652)	.753	0.64	0.59
Teacher Status (Full time = 1)	0.67	(0.15)	(552)	.000 ***	**0.76**	**0.46**	0.56	(0.15)	(651)	<.001 ***	**0.75**	**0.49**
District Size	0.12	(0.11)	(551)	.284	0.65	0.59	0.02	(0.09)	(650)	.868	0.64	0.63
Ethnic (Asian/Pacific Islander =1)	-0.28	(0.19)	(550)	.130	0.55	0.71	0.09	(0.17)	(649)	.566	0.65	0.67
Ethnic (Black/African American =1)	-0.29	(0.22)	(549)	.200	0.55	0.71	-0.33	(0.19)	(648)	.090 .	0.55	0.67
Ethnic (More than 1 race =1)	0.15	(0.23)	(548)	.525	0.66	0.71	0.08	(0.22)	(647)	.727	0.65	0.67
Model Information												
AIC	600						770					

Note. N = 557 teachers (2017-2018);N = 656 teachers (2018-2019). Teacher's retention & mobility status are dummy coded (with Movers-in=1, Others=0); Three school grade levels are effect coded, with elementary school as reference group; Teacher status is effect-coded, with full time teacher =1, part time teachers = -1;Ethnic groups are effect-coded, with Hispanic/Latinx group as reference group. Poverty level and district size are z-scored. R lme4 package used to estimate models.

* *p* < .05, ** *p* < .01, *** *p* < .001.

Appendix Q2: Logistic Regression Results for Retention and Mobility of Beginning Teachers of Color: Beginning Teacher Movers-in vs. Others within Non-Stayers

Fixed Effects	2015-2016 (1-level Model)				Predicted Probability		2016-2017 (1-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-0.64	(0.35)	(100)	.071	0.35	0.35	-0.62	(0.28)	(122)	.028 *	0.35	0.35
School Poverty (FRL%)	-0.16	(0.27)	(99)	.557	0.31	0.38	0.07	(0.22)	(121)	.765	0.37	0.34
Grade Level (Middle School = 1)	-0.18	(0.44)	(98)	.676	0.31	0.46	0.84	(0.34)	(120)	.014 *	**0.56**	**0.21**
Grade Level (High School =1)	-0.30	(0.48)	(97)	.526	0.28	0.46	-0.16	(0.32)	(119)	.621	0.32	0.21
Teacher Status (Full time = 1)	-0.96	(0.37)	(96)	.009 **	**0.17**	**0.58**	0.27	(0.27)	(118)	.322	0.41	0.29
District Size	0.18	(0.24)	(95)	.451	0.39	0.31	0.08	(0.22)	(117)	.700	0.37	0.33
Ethnic (Asian/Pacific Islander =1)	-0.64	(0.50)	(94)	.206	0.22	0.43	-0.50	(0.35)	(116)	.155	0.25	0.39
Ethnic (Black/African American =1)	0.30	(0.51)	(93)	.560	0.42	0.43	0.92	(0.43)	(115)	.031 *	**0.58**	**0.39**
Ethnic (More than 1 race =1)	0.00	(0.51)	(92)	.999	0.35	0.43	-0.59	(0.50)	(114)	.235	0.23	0.39
Model Information												
AIC	125						160					

Note. N = 101 teachers (2015-2016);N = 123 teachers (2016-2017).

* p < .05, ** p < .01, *** p < .001.

Fixed Effects	2017-2018 (1-level Model)				Predicted Probability		2018-2019 (1-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-1.09	(0.35)	(132)	.002 **	0.25	0.25	-0.74	(0.27)	(179)	.006 **	0.32	0.32
School Poverty (FRL%)	0.25	(0.22)	(131)	.272	0.30	0.21	-0.02	(0.17)	(178)	.888	0.32	0.33
Grade Level (Middle School = 1)	0.13	(0.35)	(130)	.720	0.28	0.27	-0.07	(0.31)	(177)	.818	0.31	0.42
Grade Level (High School =1)	-0.22	(0.36)	(129)	.528	0.21	0.27	-0.35	(0.29)	(176)	.228	0.25	0.42
Teacher Status (Full time = 1)	-0.09	(0.26)	(128)	.729	0.24	0.27	0.07	(0.23)	(175)	.750	0.34	0.31
District Size	0.40	(0.21)	(127)	.059	0.34	0.18	0.19	(0.16)	(174)	.224	0.37	0.28
Ethnic (Asian/Pacific Islander =1)	0.19	(0.41)	(126)	.646	0.29	0.42	-0.07	(0.31)	(173)	.821	0.31	0.35
Ethnic (Black/African American =1)	0.80	(0.45)	(125)	.075	0.43	0.42	0.17	(0.34)	(172)	.610	0.36	0.35
Ethnic (More than 1 race =1)	-1.74	(0.80)	(124)	.030 *	**0.06**	**0.42**	-0.22	(0.40)	(171)	.585	0.28	0.35
Model Information												
AIC	172						252					

Note. N = 133 teachers (2017-2018);N =180 teachers (2018-2019);Teacher's retention & mobility status are dummy coded (with Movers-in=1, Others=0); Three school grade levels are effect coded, with elementary school as reference group; Teacher status is effect-coded, with full time teacher =1, part time teachers = -1;Ethnic groups are effect-coded, with Hispanic/Latinx group as reference group. Poverty level and district size are z-scored. R lme4 package used to estimate models.

* p < .05, ** p < .01, *** p < .001.

Appendix Q3: Logistic Regression Results for Retention and Mobility of Beginning Teachers of Color: Beginning Teacher Movers-out vs. Others within Non-Stayers

Fixed Effects	2015-2016 (1-level Model)				Predicted Probability		2016-2017 (1-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-1.06	(0.43)	(100)	.013 *	0.26	0.26	-1.67	(0.35)	(122)	<.001 ***	0.16	0.16
School Poverty (FRL%)	0.22	(0.25)	(99)	.377	0.30	0.22	-0.03	(0.25)	(121)	.897	0.15	0.16
Grade Level (Middle School = 1)	0.35	(0.38)	(98)	.364	0.33	0.30	0.26	(0.42)	(120)	.536	0.20	0.22
Grade Level (High School =1)	-0.57	(0.45)	(97)	.210	0.16	0.30	-0.64	(0.46)	(119)	.161	0.09	0.22
Teacher Status (Full time = 1)	0.37	(0.43)	(96)	.386	0.33	0.19	-0.01	(0.32)	(118)	.982	0.16	0.16
District Size	-0.34	(0.24)	(95)	.152	0.20	0.33	0.07	(0.25)	(117)	.795	0.17	0.15
Ethnic (Asian/Pacific Islander =1)	-0.14	(0.42)	(94)	.731	0.23	0.25	0.27	(0.39)	(116)	.485	0.20	0.12
Ethnic (Black/African American =1)	0.34	(0.47)	(93)	.465	0.33	0.25	-0.68	(0.61)	(115)	.268	0.09	0.12
Ethnic (More than 1 race =1)	-0.17	(0.47)	(92)	.724	0.23	0.25	0.68	(0.50)	(114)	.167	0.27	0.12
Model Information												
AIC	140						131					

Note. N = 101 teachers (2015-2016);N = 123 teachers (2016-2017).

* p < .05, ** p < .01, *** p < .001.

Fixed Effects	2017-2018 (1-level Model)				Predicted Probability		2018-2019 (1-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-1.23	(0.32)	(132)	<.001 ***	0.23	0.23	-1.93	(0.37)	(179)	<.001 ***	0.13	0.13
School Poverty (FRL%)	-0.06	(0.23)	(131)	.788	0.22	0.24	-0.28	(0.24)	(178)	.253	0.10	0.16
Grade Level (Middle School = 1)	-0.57	(0.41)	(130)	.163	0.14	0.24	-0.06	(0.42)	(177)	.888	0.12	0.12
Grade Level (High School =1)	0.47	(0.36)	(129)	.199	0.32	0.24	0.13	(0.37)	(176)	.722	0.14	0.12
Teacher Status (Full time = 1)	0.58	(0.30)	(128)	.050	0.34	0.14	-0.11	(0.30)	(175)	.699	0.11	0.14
District Size	-0.32	(0.24)	(127)	.173	0.17	0.29	-0.46	(0.28)	(174)	.099	0.08	0.19
Ethnic (Asian/Pacific Islander =1)	0.19	(0.35)	(126)	.584	0.26	0.13	-0.17	(0.48)	(173)	.721	0.11	0.17
Ethnic (Black/African American =1)	-0.54	(0.44)	(125)	.217	0.15	0.13	-0.74	(0.60)	(172)	.218	0.06	0.17
Ethnic (More than 1 race =1)	1.04	(0.43)	(124)	.017 *	**0.45**	**0.13**	0.57	(0.50)	(171)	.253	0.20	0.17
Model Information												
AIC	165						154					

Note. N = 133 teachers (2017-2018);N =180 teachers (2018-2019);Teacher's retention & mobility status are dummy coded (with Movers-out=1, Others=0); Three school grade levels are effect coded, with elementary school as reference group; Teacher status is effect-coded, with full time teacher =1, part time teachers = -1;Ethnic groups are effect-coded, with Hispanic group as reference group. Poverty level and district size are z-scored. R lme4 package used to estimate models.

* p < .05, ** p < .01, *** p < .001.

Appendix Q4: Logistic Regression Results for Retention and Mobility of Beginning Teachers of Color: Beginning Teacher Exiters vs. Others within Non-Stayers

Fixed Effects	2015-2016 (1-level Model)				Predicted Probability		2016-2017 (1-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-0.77	(0.38)	(100)	.042 *	0.32	0.32	-0.20	(0.26)	(122)	.440	0.45	0.45
School Poverty (FRL%)	-0.10	(0.24)	(99)	.689	0.30	0.34	-0.02	(0.20)	(121)	.930	0.44	0.45
Grade Level (Middle School = 1)	-0.20	(0.37)	(98)	.588	0.27	0.21	-0.97	(0.37)	(120)	.008 **	**0.24**	**0.56**
Grade Level (High School =1)	0.74	(0.41)	(97)	.069	0.49	0.21	0.52	(0.31)	(119)	.090 .	0.58	0.56
Teacher Status (Full time = 1)	0.68	(0.40)	(96)	.092	0.48	0.19	-0.27	(0.26)	(118)	.284	0.38	0.52
District Size	0.18	(0.23)	(95)	.424	0.36	0.28	-0.12	(0.20)	(117)	.569	0.42	0.48
Ethnic (Asian/Pacific Islander =1)	0.54	(0.39)	(94)	.165	0.44	0.27	0.33	(0.32)	(116)	.301	0.53	0.47
Ethnic (Black/African American =1)	-0.55	(0.48)	(93)	.256	0.21	0.27	-0.49	(0.42)	(115)	.246	0.33	0.47
Ethnic (More than 1 race =1)	0.23	(0.46)	(92)	.614	0.37	0.27	0.07	(0.43)	(114)	.873	0.47	0.47
Model Information												
AIC	143						178					

Note. N = 101 teachers (2015-2016);N = 123 teachers (2016-2017).

* p < .05, ** p < .01, *** p < .001.

Fixed Effects	2017-2018 (1-level Model)				Predicted Probability		2018-2019 (1-level Model)				Predicted Probability	
	Coeff	(SE)	(df)	p	Yes/More	No/Less	Coeff	(SE)	(df)	p	Yes/More	No/Less
Intercept	-0.26	(0.25)	(132)	.300	0.44	0.44	0.09	(0.25)	(179)	.733	0.52	0.52
School Poverty (FRL%)	-0.15	(0.21)	(131)	.464	0.40	0.47	0.15	(0.17)	(178)	.359	0.56	0.48
Grade Level (Middle School = 1)	0.31	(0.33)	(130)	.352	0.51	0.40	0.11	(0.29)	(177)	.696	0.55	0.44
Grade Level (High School =1)	-0.17	(0.33)	(129)	.594	0.39	0.40	0.23	(0.27)	(176)	.394	0.58	0.44
Teacher Status (Full time = 1)	-0.34	(0.23)	(128)	.134	0.35	0.52	-0.01	(0.22)	(175)	.970	0.52	0.52
District Size	-0.13	(0.21)	(127)	.523	0.40	0.47	-0.01	(0.16)	(174)	.958	0.52	0.52
Ethnic (Asian/Pacific Islander =1)	-0.07	(0.33)	(126)	.827	0.42	0.45	0.19	(0.30)	(173)	.536	0.57	0.46
Ethnic (Black/African American =1)	-0.08	(0.40)	(125)	.831	0.41	0.45	0.13	(0.32)	(172)	.683	0.55	0.46
Ethnic (More than 1 race =1)	0.09	(0.42)	(124)	.825	0.46	0.45	-0.08	(0.37)	(171)	.837	0.50	0.46
Model Information												
AIC	190						263					

Note. N = 133 teachers (2017-2018);N =180 teachers (2018-2019);Teacher's retention & mobility status are dummy coded (with Exiters=1, Others=0); Three school grade levels are effect coded, with elementary school as reference group; Teacher status is effect-coded, with full time teacher =1, part time teachers = -1;Ethnic groups are effect-coded, with Hispanic group as reference group. Poverty level and district size are z-scored. R lme4 package used to estimate models.

* p < .05, ** p < .01, *** p < .001.

Appendix R1: Logistic Regression Results for Retention and Mobility for All Teachers of Color Statewide: Teachers of Color Stayers vs. Non-Stayers

Fixed Effects	2015-2016 (1-level Model)			Predicted Probability		2016-2017 (1-level Model)			Predicted Probability	
	Coeff	(SE)	p	Yes/More	No/Less	Coeff	(SE)	p	Yes/More	No/Less
Intercept	1.10	(0.08)	<.001 ***	0.75	0.75	1.02	(0.08)	<.001 ***	0.73	0.73
School Poverty (FRPL %)	-0.06	(0.04)	.135	0.74	0.76	-0.02	(0.04)	.587	0.73	0.74
Total District Enrollment	-0.05	(0.04)	.200	0.74	0.75	-0.10	(0.04)	<.01 **	0.72	0.76
Grade Level (1 = Middle School)	-0.19	(0.06)	<.01 **	0.71	0.74	-0.11	(0.06)	.068 .	0.71	0.74
Grade Level (1 = High School)	0.24	(0.06)	<.001 ***	0.79	0.74	0.07	(0.06)	.212	0.75	0.74
Employment Status (1 = Full time)	0.42	(0.07)	<.001 ***	0.82	0.66	0.41	(0.07)	<.001 ***	0.81	0.65
Experience (1 = Beginning teacher)	-0.11	(0.06)	.069	0.73	0.77	-0.17	(0.06)	<.01 **	0.70	0.77
Ethnic (Asian/Pacific Islander = 1)	0.05	(0.06)	.406	0.76	0.77	0.08	(0.06)	.211	0.75	0.75
Ethnic (Black/African American = 1)	-0.19	(0.08)	<.05 *	0.71	0.77	-0.14	(0.08)	.073 .	0.71	0.75
Ethnic (More than 1 race = 1)	0.00	(0.08)	.992	0.75	0.77	-0.03	(0.08)	.719	0.73	0.75

N = 5280 teachers (2015-2016), 5684 teachers (2016-2017).

* p < .05, ** p < .01, *** p < .001.

Fixed Effects	2017-2018 (1-level Model)			Predicted Probability		2018-2019 (1-level Model)			Predicted Probability	
	Coeff	(SE)	p	Yes/More	No/Less	Coeff	(SE)	p	Yes/More	No/Less
Intercept	0.87	(0.08)	<.001 ***	0.70	0.70	0.87	(0.08)	<.001 ***	0.70	0.70
School Poverty (FRPL %)	-0.15	(0.04)	<.001 ***	0.67	0.73	-0.05	(0.04)	.212	0.69	0.71
Total District Enrollment	0.02	(0.04)	.547	0.71	0.67	0.02	(0.04)	.621	0.71	0.69
Grade Level (1 = Middle School)	-0.03	(0.06)	.670	0.70	0.67	-0.12	(0.06)	<.05 *	0.68	0.69
Grade Level (1 = High School)	0.18	(0.06)	<.01 **	0.74	0.67	0.19	(0.06)	<.01 **	0.74	0.69
Employment Status (1 = Full time)	0.62	(0.06)	<.001 ***	0.82	0.56	0.54	(0.07)	<.001 ***	0.80	0.58
Experience (1 = Beginning teacher)	-0.14	(0.05)	<.01 **	0.67	0.73	-0.34	(0.05)	<.001 ***	0.63	0.77
Ethnic (Asian/Pacific Islander = 1)	0.00	(0.06)	.966	0.71	0.74	0.04	(0.06)	.497	0.71	0.73
Ethnic (Black/African American = 1)	-0.11	(0.08)	.150	0.68	0.74	-0.23	(0.08)	<.01 **	0.65	0.73
Ethnic (More than 1 race = 1)	-0.05	(0.07)	.532	0.69	0.74	0.06	(0.08)	.453	0.72	0.73

N = 6080 teachers (2017-2018), 6440 teachers (2018-2019)

Note: Teacher's retention & mobility status are dummy coded (with Mover-out =1, Others=0); Three school levels were effect coded (with Elementary School = -1); Teacher's experience was effect coded(with beginning teacher = 1, other teachers = -1); Four ethnicity were effect coded (with Hispanic = -1); Poverty level (Free Reduced-Priced Lunch %) and district enrollment is z-scored. R lme4 package used to estimate models.

* p < .05, ** p < .01, *** p < .001.

Appendix R2: Logistic Regression Results for Retention and Mobility for All Teachers of Color Statewide: Teachers of Color Movers-in vs. Others within Non-stayers

Fixed Effects	2015-2016 (1-level Model)			Predicted Probability		2016-2017 (1-level Model)			Predicted Probability	
	Coeff	(SE)	p	Yes/More	No/Less	Coeff	(SE)	p	Yes/More	No/Less
Intercept	-1.07	(0.17)	<.001 ***	0.25	0.25	-0.66	(0.14)	<.001 ***	0.34	0.34
School Poverty (FRPL %)	0.05	(0.07)	.497	0.26	0.25	0.02	(0.07)	.730	0.35	0.34
Total District Enrollment	0.18	(0.07)	<.05 *	0.29	0.28	0.17	(0.07)	<.05 *	0.38	0.29
Grade Level (1 = Middle School)	0.10	(0.12)	.398	0.28	0.32	0.20	(0.11)	.065 .	0.39	0.33
Grade Level (1 = High School)	-0.40	(0.13)	<.01 **	0.19	0.32	-0.14	(0.11)	.192	0.31	0.33
Employment Status (1 = Full time)	0.15	(0.13)	.242	0.28	0.23	0.16	(0.12)	.193	0.38	0.31
Experience (1 = Beginning teacher)	-0.21	(0.12)	.080 .	0.22	0.30	-0.13	(0.10)	.223	0.31	0.37
Ethnic (Asian/Pacific Islander = 1)	0.06	(0.12)	.600	0.27	0.27	0.21	(0.11)	.056	0.39	0.31
Ethnic (Black/African American = 1)	-0.20	(0.16)	.203	0.22	0.27	-0.14	(0.14)	.340	0.31	0.31
Ethnic (More than 1 race = 1)	0.06	(0.15)	.712	0.27	0.27	0.08	(0.14)	.578	0.36	0.31

N = 899 teachers (2015-2016), 1112 teachers (2016-2017).

* p < .05, ** p < .01, *** p < .001.

Fixed Effects	2017-2018 (1-level Model)			Predicted Probability		2018-2019 (1-level Model)			Predicted Probability	
	Coeff	(SE)	p	Yes/More	No/Less	Coeff	(SE)	p	Yes/More	No/Less
Intercept	-0.85	(0.14)	<.001 ***	0.30	0.30	-0.69	(0.13)	<.001 ***	0.33	0.33
School Poverty (FRPL %)	0.13	(0.07)	<.05 *	0.33	0.27	0.00	(0.07)	.953	0.33	0.34
Total District Enrollment	0.12	(0.07)	.063	0.33	0.32	0.09	(0.07)	.166	0.36	0.42
Grade Level (1 = Middle School)	0.13	(0.12)	.253	0.33	0.35	-0.08	(0.11)	.480	0.32	0.44
Grade Level (1 = High School)	-0.36	(0.12)	<.01 **	0.23	0.35	-0.37	(0.12)	<.01 **	0.26	0.44
Employment Status (1 = Full time)	0.20	(0.11)	.061	0.34	0.26	-0.02	(0.11)	.824	0.33	0.34
Experience (1 = Beginning teacher)	-0.12	(0.10)	.215	0.27	0.33	-0.02	(0.09)	.845	0.33	0.34
Ethnic (Asian/Pacific Islander = 1)	-0.02	(0.11)	.878	0.30	0.36	-0.02	(0.11)	.872	0.33	0.39
Ethnic (Black/African American = 1)	-0.20	(0.14)	.160	0.26	0.36	-0.29	(0.14)	<.05 *	0.27	0.39
Ethnic (More than 1 race = 1)	-0.05	(0.14)	.711	0.29	0.36	0.06	(0.14)	.669	0.35	0.39

N = 989 teachers (2017-2018), 1065 teachers (2018-2019)

Note: Teacher's retention & mobility status are dummy coded (with Mover-out =1, Others=0); Three school levels were effect coded (with Elementary School = -1); Teacher's experience was effect coded(with beginning teacher = 1, other teachers = -1); Four ethnicity were effect coded (with Hispanic = -1); Poverty level (Free Reduced-Priced Lunch %) and district enrollment is z-scored. R lme4 package used to estimate models.

* p < .05, ** p < .01, *** p < .001.

Appendix R3: Logistic Regression Results for Retention and Mobility for All Teachers of Color Statewide: Teachers of Color Movers-out vs. Others within Non-stayers

Fixed Effects	2015-2016 (1-level Model)			Predicted Probability		2016-2017 (1-level Model)			Predicted Probability	
	Coeff	(SE)	p	Yes/More	No/Less	Coeff	(SE)	p	Yes/More	No/Less
Intercept	-0.93	(0.17)	<.001 ***	0.28	0.28	-1.48	(0.18)	<.001 ***	0.19	0.19
School Poverty (FRPL %)	0.14	(0.08)	.497	0.31	0.26	0.08	(0.08)	.316	0.20	0.17
Total District Enrollment	-0.19	(0.08)	<.05 *	0.25	0.26	-0.35	(0.09)	<.001 ***	0.14	0.25
Grade Level (1 = Middle School)	-0.01	(0.12)	.398	0.28	0.23	-0.25	(0.14)	.080	0.15	0.19
Grade Level (1 = High School)	0.30	(0.12)	<.01 **	0.35	0.23	0.21	(0.13)	.099	0.22	0.19
Employment Status (1 = Full time)	0.21	(0.14)	.242	0.33	0.24	0.13	(0.15)	.388	0.21	0.17
Experience (1 = Beginning teacher)	0.20	(0.11)	.080 .	0.33	0.24	-0.10	(0.13)	.425	0.17	0.20
Ethnic (Asian/Pacific Islander = 1)	0.00	(0.13)	.600	0.28	0.28	-0.22	(0.14)	.110	0.15	0.17
Ethnic (Black/African American = 1)	0.00	(0.16)	.203	0.28	0.28	0.24	(0.16)	.142	0.22	0.17
Ethnic (More than 1 race = 1)	0.01	(0.16)	.712	0.29	0.28	0.07	(0.16)	.690	0.20	0.17

N = 899 teachers (2015-2016), 1112 teachers (2016-2017).

* p < .05, ** p < .01, *** p < .001.

Fixed Effects	2017-2018 (1-level Model)			Predicted Probability		2018-2019 (1-level Model)			Predicted Probability	
	Coeff	(SE)	p	Yes/More	No/Less	Coeff	(SE)	p	Yes/More	No/Less
Intercept	-1.41	(0.17)	<.001 ***	0.20	0.20	-1.73	(0.19)	<.001 ***	0.15	0.15
School Poverty (FRPL %)	0.01	(0.08)	.942	0.20	0.20	0.09	(0.09)	.316	0.16	0.14
Total District Enrollment	-0.07	(0.08)	.386	0.19	0.18	-0.26	(0.10)	<.01 **	0.12	0.14
Grade Level (1 = Middle School)	-0.11	(0.13)	.411	0.18	0.17	0.17	(0.13)	.204	0.17	0.11
Grade Level (1 = High School)	0.26	(0.12)	<.05 *	0.24	0.17	0.20	(0.13)	.128	0.18	0.11
Employment Status (1 = Full time)	0.56	(0.15)	<.001 ***	0.30	0.12	0.29	(0.17)	.087	0.19	0.12
Experience (1 = Beginning teacher)	0.21	(0.11)	<.05 *	0.23	0.16	-0.14	(0.12)	.224	0.13	0.17
Ethnic (Asian/Pacific Islander = 1)	-0.10	(0.13)	.426	0.18	0.20	-0.26	(0.15)	.086	0.12	0.13
Ethnic (Black/African American = 1)	-0.25	(0.17)	.126	0.16	0.20	-0.03	(0.17)	.878	0.15	0.13
Ethnic (More than 1 race = 1)	0.31	(0.15)	<.05 *	0.25	0.20	0.43	(0.17)	<.05 *	0.21	0.13

N = 989 teachers (2017-2018), 1065 teachers (2018-2019).

Note: Teacher's retention & mobility status are dummy coded (with Mover-out =1, Others=0); Three school levels were effect coded (with Elementary School = -1); Teacher's experience was effect coded(with beginning teacher = 1, other teachers = -1); Four ethnicity were effect coded (with Hispanic = -1); Poverty level (Free Reduced-Priced Lunch %) and district enrollment is z-scored. R lme4 package used to estimate models.

* p < .05, ** p < .01, *** p < .001.

Appendix R4: Logistic Regression Results for Retention and Mobility for All Teachers of Color Statewide: Teachers of Color Exiters vs. Other Non-stayers

Fixed Effects	2015-2016 (1-level Model)			Predicted Probability		2016-2017 (1-level Model)			Predicted Probability	
	Coeff	(SE)	p	Yes/More	No/Less	Coeff	(SE)	p	Yes/More	No/Less
Intercept	-0.23	(0.15)	.124	0.44	0.44	-0.16	(0.13)	.221	0.46	0.46
School Poverty (FRPL %)	-0.16	(0.07)	<.05 *	0.40	0.48	-0.08	(0.07)	.236	0.44	0.48
Total District Enrollment	-0.02	(0.07)	.743	0.44	0.44	0.05	(0.07)	.491	0.47	0.46
Grade Level (1 = Middle School)	-0.06	(0.12)	.591	0.43	0.44	-0.04	(0.11)	.744	0.45	0.47
Grade Level (1 = High School)	0.09	(0.12)	.423	0.47	0.44	0.00	(0.11)	.973	0.46	0.47
Employment Status (1 = Full time)	-0.28	(0.11)	<.05 *	0.38	0.51	-0.22	(0.11)	.052	0.41	0.51
Experience (1 = Beginning teacher)	0.01	(0.11)	.918	0.45	0.44	0.19	(0.10)	.056	0.51	0.41
Ethnic (Asian/Pacific Islander = 1)	-0.06	(0.12)	.611	0.43	0.43	-0.06	(0.11)	.582	0.44	0.51
Ethnic (Black/African American = 1)	0.18	(0.15)	.208	0.49	0.43	-0.03	(0.14)	.838	0.45	0.51
Ethnic (More than 1 race = 1)	-0.06	(0.15)	.697	0.43	0.43	-0.12	(0.14)	.412	0.43	0.51

N = 899 teachers (2015-2016), 1112 teachers (2016-2017).

* *p* < .05, ** *p* < .01, *** *p* < .001.

Fixed Effects	2017-2018 (1-level Model)			Predicted Probability		2018-2019 (1-level Model)			Predicted Probability	
	Coeff	(SE)	p	Yes/More	No/Less	Coeff	(SE)	p	Yes/More	No/Less
Intercept	-0.11	(0.13)	.407	0.47	0.47	-0.03	(0.13)	.803	0.49	0.49
School Poverty (FRPL %)	-0.15	(0.07)	<.05 *	0.44	0.51	-0.05	(0.07)	.463	0.48	0.50
Total District Enrollment	-0.08	(0.07)	.273	0.45	0.47	0.05	(0.07)	.481	0.50	0.43
Grade Level (1 = Middle School)	-0.03	(0.12)	.794	0.47	0.45	-0.01	(0.11)	.934	0.49	0.44
Grade Level (1 = High School)	0.13	(0.11)	.237	0.51	0.45	0.22	(0.11)	<.05 *	0.55	0.44
Employment Status (1 = Full time)	-0.51	(0.10)	<.001 ***	0.35	0.60	-0.12	(0.11)	.278	0.46	0.52
Experience (1 = Beginning teacher)	-0.05	(0.10)	.611	0.46	0.49	0.09	(0.08)	.283	0.51	0.47
Ethnic (Asian/Pacific Islander = 1)	0.11	(0.11)	.321	0.50	0.40	0.17	(0.11)	.125	0.53	0.46
Ethnic (Black/African American = 1)	0.40	(0.14)	<.01 **	0.57	0.40	0.29	(0.13)	<.05 *	0.56	0.46
Ethnic (More than 1 race = 1)	-0.19	(0.14)	.166	0.43	0.40	-0.32	(0.14)	<.05 *	0.41	0.46

N = 989 teachers (2017-2018), 1065 teachers (2018-2019).

Note: Teacher's retention & mobility status are dummy coded (with Mover-out =1, Others=0); Three school levels were effect coded (with Elementary School = -1); Teacher's experience was effect coded (with beginning teacher = 1, other teachers = -1); Four ethnicity were effect coded (with Hispanic = -1); Poverty level (Free Reduced-Priced Lunch %) and district enrollment is z-scored. R lme4 package used to estimate
* *p* < .05, ** *p* < .01, *** *p* < .001.