EDUCATION POLICY INITIATIVE *at* CAROLINA

Access to a Well-Credentialed, Effective, and Diverse Teacher Workforce in North Carolina

In this research brief, we assess the distribution of well-credentialed, effective, and diverse teachers in North Carolina. There are three primary takeaways from these analyses. First, across every teacher measure considered, we find that students from historically marginalized populations have less access to well-credentialed and effective teachers. These differences in access are meaningful in size and show that teachers are distributed in ways that compound societal inequalities. Second, we find that the largest source of variation in access to well-credentialed and effective teachers is between schools in the same district. Although smaller in magnitude, there are also meaningful differences in access to teachers between districts and within schools. Lastly, we find large mismatches between the demographics of K–12 students and the teacher workforce. White students frequently have White teachers; it is rare for students of color to have a same race teacher.

Introduction

Teachers are the most important school-based resource explaining students' academic development. Relative to peers taught by ineffective teachers, students taught by highly-effective teachers gain 7.5 additional months of learning in mathematics and 3 additional months of learning in reading. Likewise, students of color taught by a same race teacher are less likely to face exclusionary discipline practices, make larger achievement gains, and are more likely to graduate from high school and enroll in college.

Given the importance of teachers, it is imperative that state and local education officials understand their distribution, especially to students from historically marginalized groups. Teachers can be distributed equitably, such that all students have the same likelihood of being taught by an effective instructor. Teachers may also be distributed in ways that compound or compensate for societal and educational inequalities. Prior work shows that teachers are distributed in ways that compound inequality, with students from historically marginalized populations being less likely to have well-credentialed and highly-effective teachers.[1]

In these analyses, EPIC uses recent data from North Carolina to update prior work on the distribution of well-credentialed and effective teachers. Furthermore, we extend analyses on the distribution of teachers by assessing the extent to which students are taught by same race teachers and other teachers of color. Our work is unique in its comprehensiveness, as we examine students in all grade levels (K–12), consider multiple indicators of student marginalization, and assess a range of teacher credential, performance, and demographic measures. In particular, we address the following questions: (1) What is the distribution of well-credentialed and effective teachers in North Carolina? (2) What explains differences in access to well-credentialed and effective teachers? and (3) What is the distribution of diverse teachers in North Carolina?

[1] Examples of this prior work include Lankford, Loeb, & Wyckoff (2002); Clotfelter, Ladd, & Vigdor (2005); and Goldhaber, Lavery, & Theobald (2015).

With answers to these questions, we hope to elevate the issue of access to an effective and diverse teacher workforce. Highlighting this issue is especially important as North Carolina confronts issues—e.g. Leandro recommendations, COVID-19—of educational inequality.

Background

In these analyses we focus on students and their core content area teachers (e.g. English/reading, mathematics, science, and social studies) in the 2018–19 school year.[2] In particular, we use classroom roster data from the North Carolina Department of Public Instruction (NCDPI) and keep observations for all core content area classes. By connecting student and teacher characteristics to these course taking data, we assess the distribution of well-credentialed, effective, and diverse teachers.

We are interested in differences in access to teachers based on students' race/ethnicity, economic status, and measures of prior-year (2017–18) test performance. The top panel of Table 1 presents descriptive data for K–12 students in 2018–19. Overall, 33 percent of North Carolina K–12 students are white and non-economically disadvantaged. The next highest percentages are for students who are Black and economically disadvantaged (17.4%), White and economically disadvantaged (14.0%), and Hispanic and economically disadvantaged (12.2%). A unique aspect of this work, relative to prior studies, is that we jointly consider student race/ethnicity and economic status—e.g. comparing access to teachers for White non-economically disadvantaged students versus Black economically disadvantaged students. For students with prior test score data, we classify approximately 15 percent as high-performing, 69 percent as middle-performing, and 16 percent as low-performing.[3]

At the teacher level, we want to assess the distribution of well-credentialed, effective, and diverse educators. The bottom panel of Table 1 displays these focal characteristics for core content teachers in 2018–19. Demographically, approximately 84 percent of these teachers are female, 81 percent are White, and 15 percent are Black. Nearly eight percent are first-year teachers and 10 percent hold National Board Certification (NBC). We assess the distribution of teachers with these credentials since prior work shows that first-year teachers are less effective than their more experienced peers and that NBC teachers are more effective than peers without the credential.[4] Lastly, descriptive data indicate that teachers' average prior-year NCEES ratings are 3.72—between proficient (level 3) and accomplished (level 4)[5]—and that teachers' average prior-year EVAAS estimates are slightly above the standardized mean.

Table 1. Characteristics of Students and Teachers in Core Content Area Classes

STUDENT CHARACTERISTICS	MEAN VALUES
% White/Non-EDS	32.89
% White/EDS	14.02
% Black/Non-EDS	7.50
% Black/EDS	17.44
% Hispanic/Non-EDS	6.64
% Hispanic/EDS	12.16
% Asian/Non-EDS	2.70
% Asian/EDS	0.95
% American Indian/Non-EDS	0.32
% American Indian/EDS	0.85
% Multiracial/Non-EDS	2.06
% Multiracial/EDS	2.47
% High-Performing Students	14.69
% Middle-Performing Students	68.97
% Low-Performing Students	16.34
TEACHER CHARACTERISTICS	**MEAN VALUES**
% Female	83.77
% White	80.52
% Black	14.65
% Hispanic	2.55
% Asian	0.93
% American Indian	1.09
% First-Year Teacher	7.86
% Nationally Board Certified	10.09
Avg. Prior-Year NCEES Rating	3.72
Avg. Prior-Year EVAAS Estimates (Std.)	0.053

Note: This table displays characteristics of the students and teachers in our analytical sample—i.e. students in core content classes and the teachers of those classes in the 2018–19 school year. EDS=economically disadvantaged students.

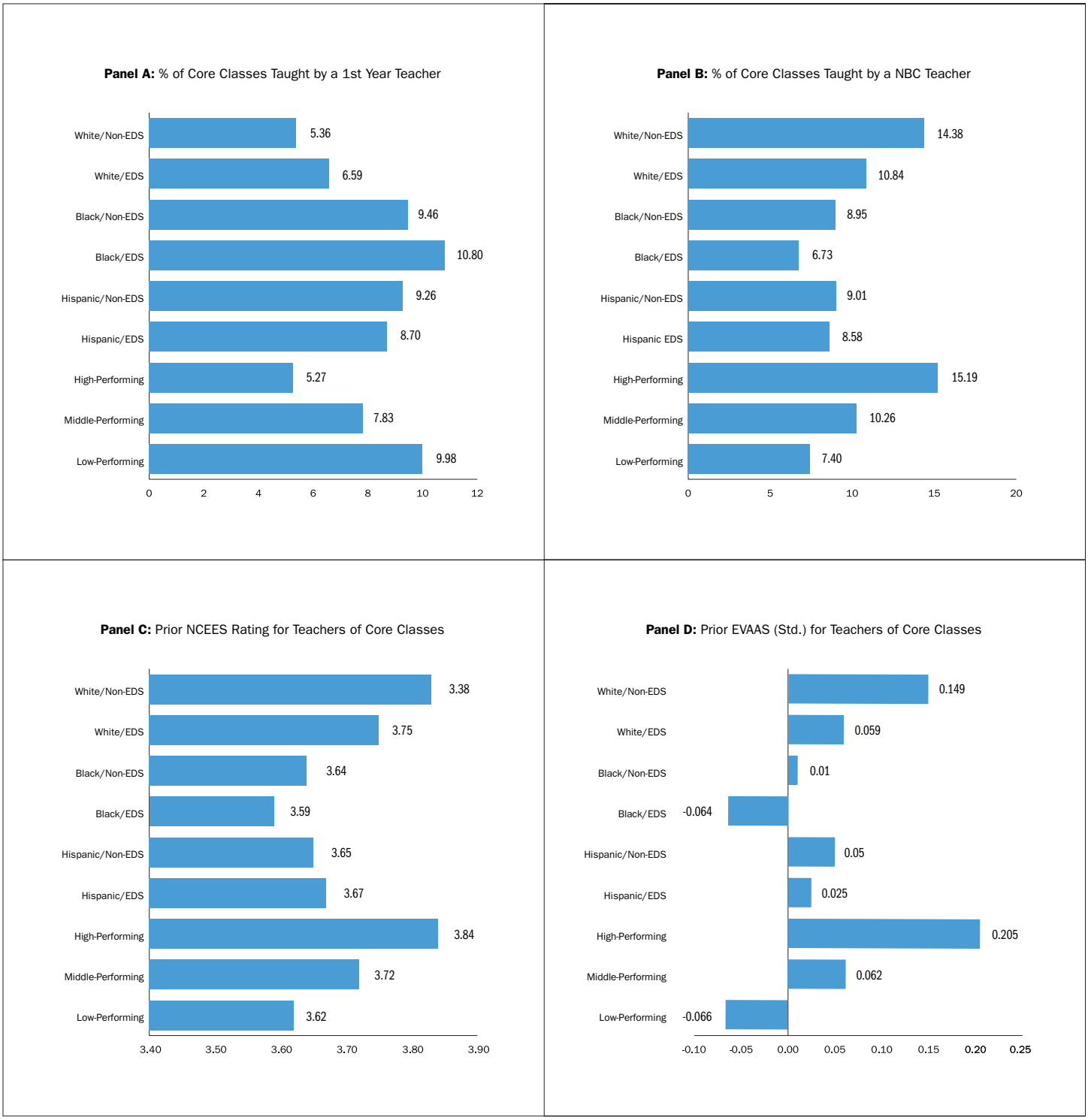
[2] This sample is limited to students and teachers in traditional (non-charter) public schools in North Carolina. We exclude charter schools since many credential and prior effectiveness measures are not available for charter school teachers.

[3] High-performing students have prior standardized test scores more than one standard deviation above the mean; low-performing students have prior standardized test scores more than one standard deviation below the mean.

[4] We do not assess the distribution of teachers with advanced degrees since this credential is not consistently associated with teacher effectiveness.

[5] Level 1 is not demonstrated, level 2 is developing, level 3 is proficient, level 4 is accomplished, and level 5 is distinguished.

Figure 1: Access to a Well-Credentialed and Effective Teacher Workforce



Note: This figure displays students' access to a well-credentialed and effective teacher workforce—the percentage of students' core content classes taught by a first-year teacher and an NBC teacher, the average prior-year NCEES ratings of core content area teachers, and the average prior-year EVAAS estimates (Std.) of core content area teachers. EDS=economically disadvantaged students.

What is the distribution of well-credentialed and effective teachers in North Carolina?

Figure 1 presents the distribution of teachers to students in core content classes in the 2018–19 school year. In particular, Panels A–D display the following: (A) the percentage of students' core content classes taught by a first-year teacher; (B) the percentage of students' core content classes taught by an NBC teacher; (C) the average prior-year NCEES ratings for students' core content teachers; and (D) the average prior-year EVAAS estimates (standardized) for students' core content teachers.

Panels A and B illustrate that students from historically marginalized populations are less likely to be taught by well-credentialed teachers. For students who are White and non-economically disadvantaged, 5.36 percent of their core content classes are taught by first-year teachers. By comparison, the percentage of core content classes taught by first-year teachers is two times higher (10.80 percent) for students who are Black and economically disadvantaged. We find similar gaps in exposure to first-year teachers for high and low-performing students—5.27 percent of high-performing students' core content classes are taught by a beginning teacher compared to 10 percent for low-performing students. Panel B shows comparable inequities in access to NBC teachers. Over 14 percent of the core content classes of White non-economically disadvantaged students are taught by an NBC teacher. The rates are 6.73 percent for students who are Black and economically disadvantaged and 8.58 percent for students who are Hispanic and economically disadvantaged. Likewise, the percentage of core content classes taught by an NBC teacher is two times higher for high (15.19) versus low-performing students (7.40).

Beyond teacher credentials, Panels C and D display sizable gaps in access to effective instructors for students from historically marginalized populations. There is a gap of 0.24 points in the prior-year NCEES ratings of those teaching students who are White and non-economically disadvantaged (3.83) versus those teaching students who are Black and economically disadvantaged (3.59). Similarly, high-performing students have teachers with prior-year NCEES ratings that are 0.22 points higher than the ratings for those teaching low-performing students. To make these differences more meaningful, we benchmark them against teachers' gains in effectiveness as they become more experienced. In doing so, we note that these NCEES gaps—by student demographics or prior test performance—are equivalent in size to the average difference in NCEES ratings between first and second-year teachers. Regarding prior-year EVAAS estimates, we find gaps of 21 percent of a standard deviation between those teaching White non-economically disadvantaged students (0.149) and those teaching Black economically disadvantaged students (-0.064). Likewise, high-performing students have teachers with prior-year EVAAS estimates that are 27 percent of a standard deviation higher than the estimates for those teaching low-performing students. In benchmarking these gaps, we note that the average difference in EVAAS estimates between first and second-year teachers is 17 percent of a standard deviation. Overall, when considering gaps in access to effective instructors (based on NCEES and EVAAS), it is as if students from historically marginalized populations are consistently assigned to first-year teachers while advantaged students are consistently assigned to those with one or more years of experience.

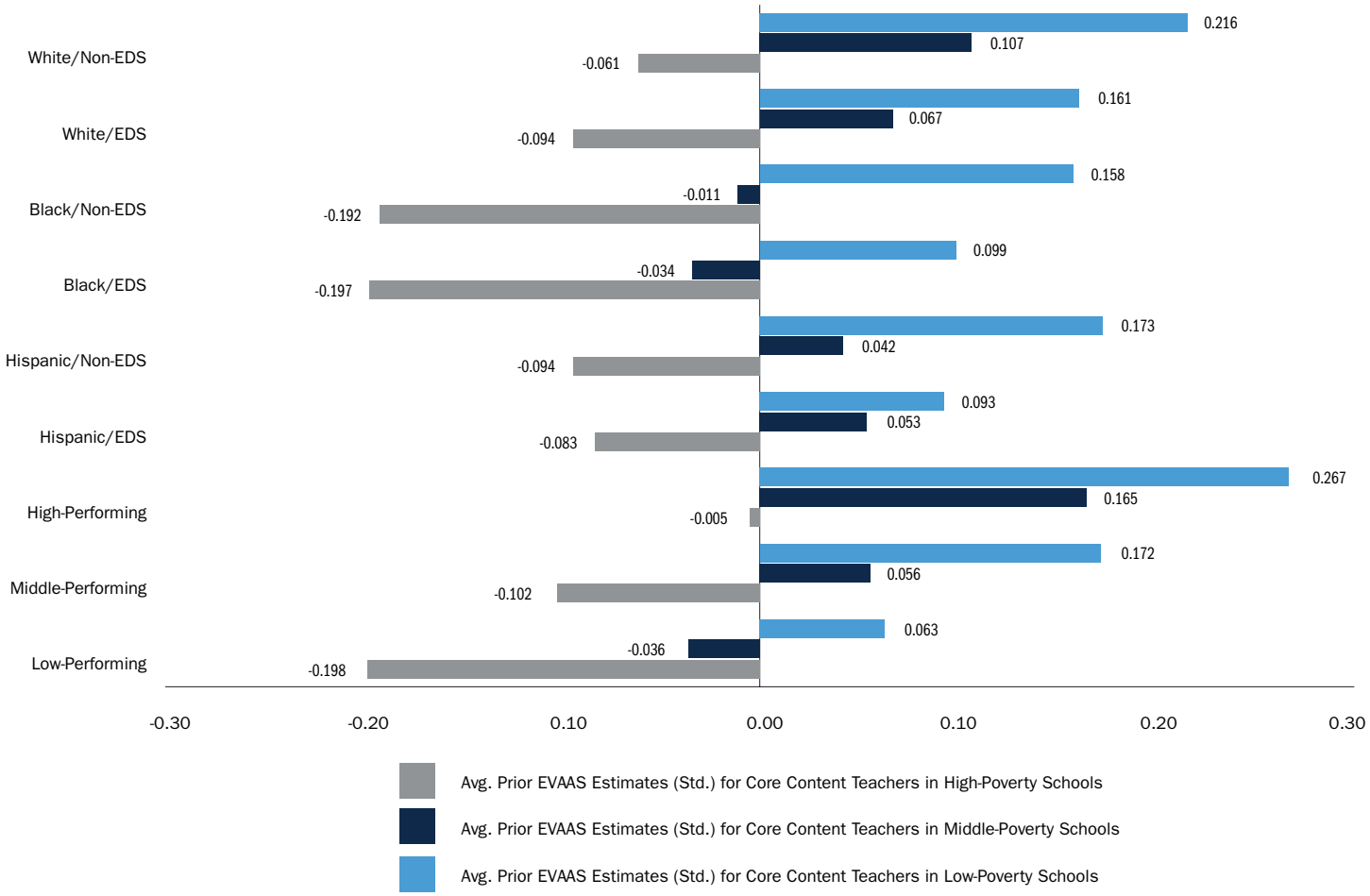
The data in Panels A–D may mask differences in access to teachers based on characteristics of the school. As such, Figure 2 displays data on teachers' prior-year EVAAS estimates by student characteristics and the poverty status of the school. Across school poverty levels—high, middle, and low-poverty schools—we find substantial variation in access to effective teachers within student groups. For example, among students who are Black and economically disadvantaged, those attending high-poverty schools[6] are taught by teachers with prior-year EVAAS estimates 30 percent of a standard deviation lower than those attending low-poverty schools (-0.197 versus 0.099). Even more concerning are the differences in teacher effectiveness between advantaged students in low-poverty schools and students from historically marginalized populations in high-poverty schools. For instance, there is a 47 percent of a standard deviation difference between the prior-year EVAAS estimates of those teaching high-performing students in low-poverty schools and those teaching low-performing students in high-poverty schools (0.267 versus -0.198). To put this difference into perspective, we note that the average difference in EVAAS estimates between first and tenth-year teachers is 40 percent of a standard deviation.

What explains differences in access to well-credentialed and effective teachers?

Figures 1 and 2 show that teachers are distributed in ways that compound inequalities for students from historically marginalized populations. This should incentivize state and local officials to enact policies and practices that more equitably distribute teachers. Doing so, however, requires an understanding of why

[6] We identify high-poverty schools as those in the top quartile for the percentage of economically disadvantaged students that they enroll. Low-poverty schools are in the bottom quartile for the percentage of economically disadvantaged students that they enroll.

Figure 2. Access to an Effective Teacher Workforce (EVAAS Estimates)—By School Poverty Status



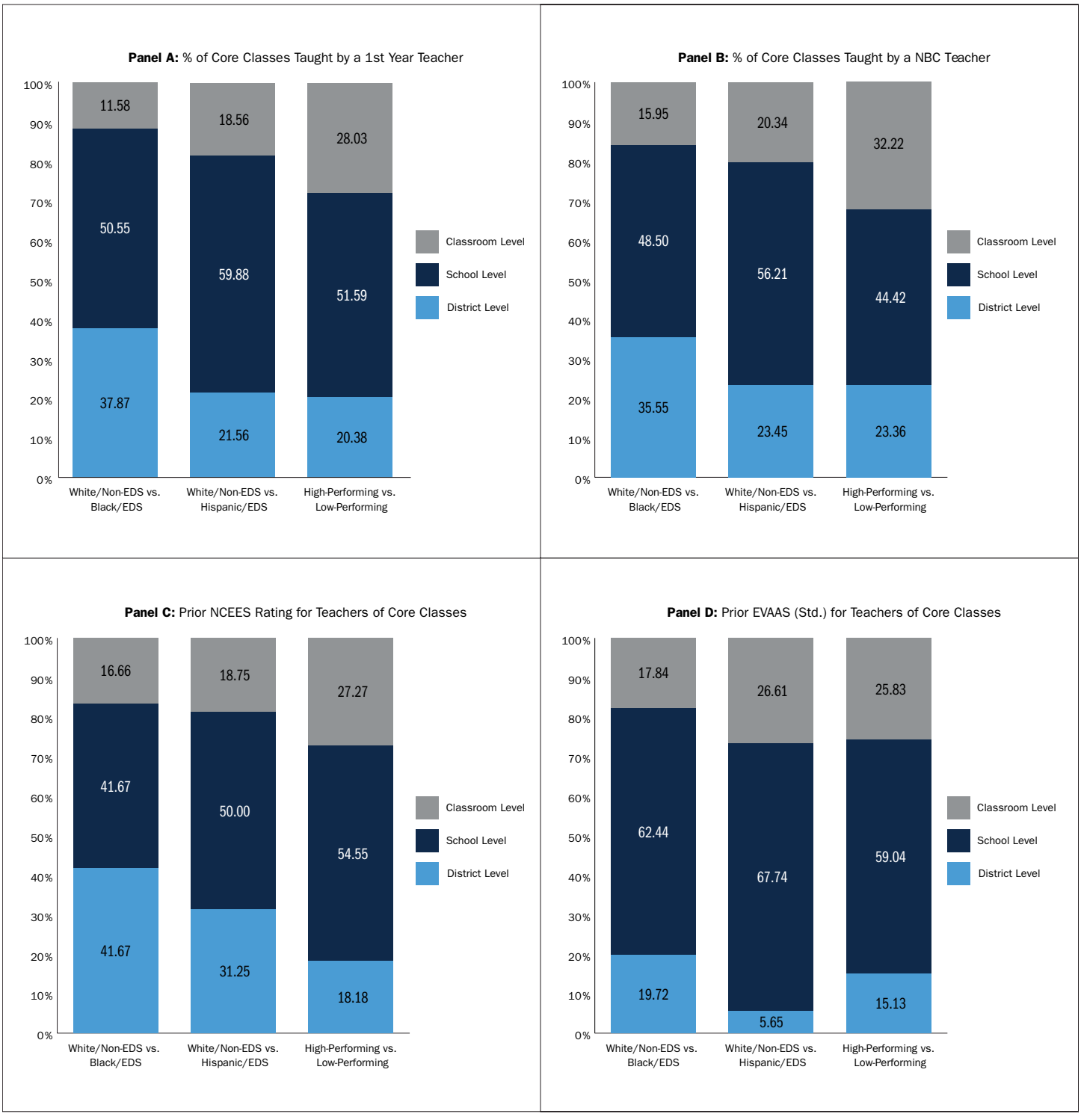
Note: This figure displays the average prior-year EVAAS estimates (Std.) for students' core content teachers by school poverty. High-poverty schools are in the top quartile of economically-disadvantaged students; middle-poverty schools are in the middle two quartiles of economically-disadvantaged students; low-poverty schools are in the bottom quartile of economically disadvantaged students. EDS=economically disadvantaged students.

teachers are inequitably distributed. This can occur in three ways: (1) when teachers are inequitably distributed between districts, such that certain districts have better-credentialed or more effective teachers; (2) when teachers are inequitably distributed between schools within districts, such that certain schools in a district have better-credentialed or more effective teachers; and (3) when teachers are inequitably distributed within schools, such that certain classes have better-credentialed or more effective teachers. Each of these mechanisms necessitate a unique set of policy and practice solutions.

To better understand these mechanisms, we decomposed the total difference in access to well-credentialed and effective teachers (shown in Figure 1) into three parts—the percent of the total difference due to across district variation, the percent of the total difference due to within district variation, and the percent of the total difference due to within school variation. We decompose the differences in access to teachers for White non-economically disadvantaged students versus Black economically disadvantaged students, White non-economically disadvantaged students versus Hispanic economically disadvantaged students, and high-performing versus low-performing students. Figure 3 displays these results, where Panels A and B decompose differences in access to first-year and NBC teachers and Panels C and D decompose differences in the prior-year NCEES ratings and EVAAS estimates of teachers.

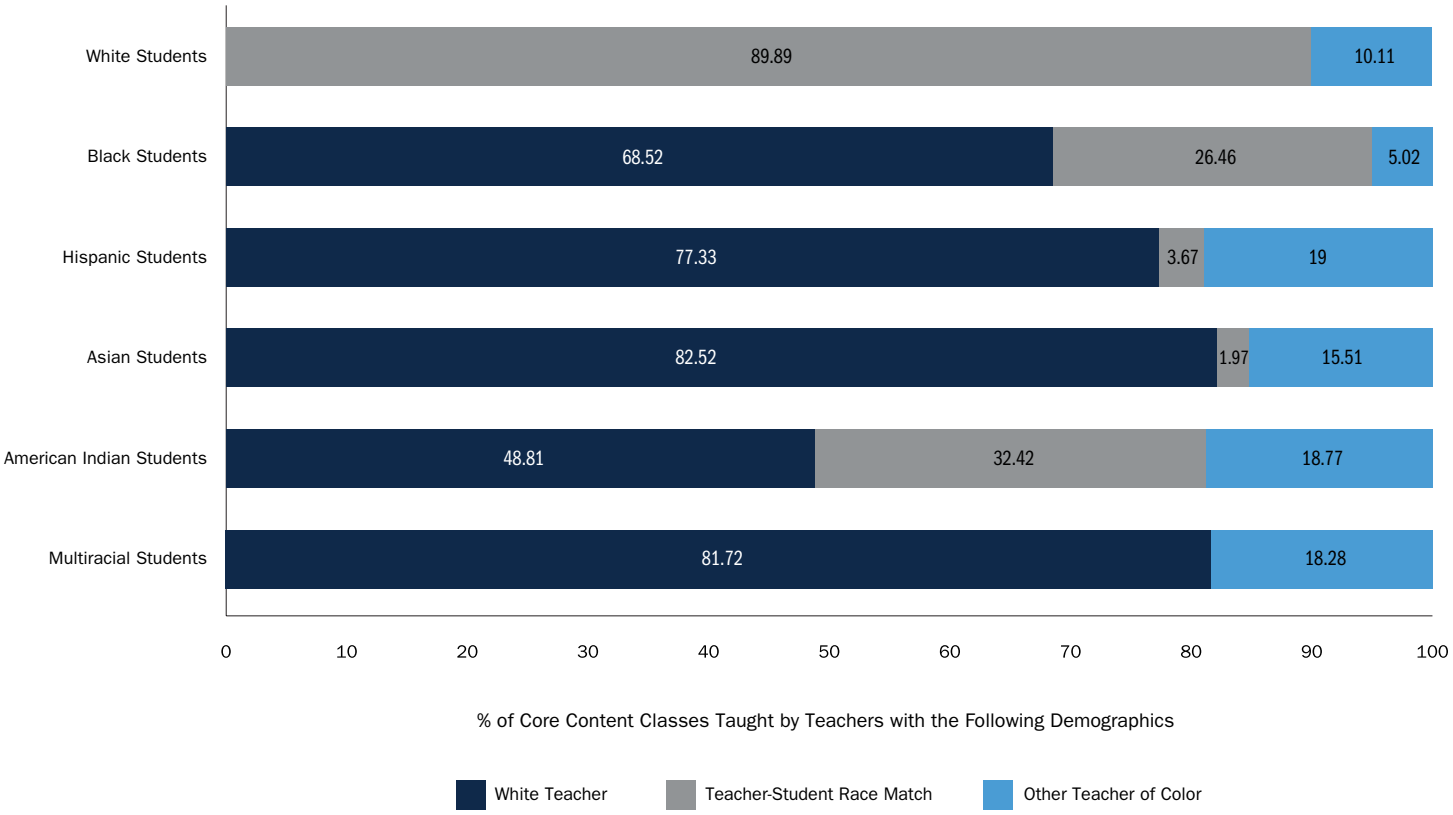
Overall, there are two main takeaways from Figure 3. First, across Panels A–D, the largest source of variation in access to well-credentialed and effective teachers is between different schools in the same district. This is especially true for EVAAS estimates (Panel D), where between school variation accounts

Figure 3. Decomposing Differences in Access to Well-Credentialed and Effective Teachers



Note: Students may have inequitable access to well-credentialed and effective teachers due to variation in access across districts (District Level), variation in access between schools within districts (School Level), and variation in access within schools (Classroom Level). This figure displays the decomposition of these district, school, and classroom level effects for ((1) White/Non-EDS vs Black/EDS; (2) White/Non-EDS vs Hispanic/EDS; and (3) High-Performing Students vs Low-Performing Students. EDS=economically disadvantaged students.

Figure 4. Access to a Diverse Teacher Workforce



Note: This figure displays the percentage of students' core content classes taught by White teachers, teachers of the same race as the student, and other teachers of color. Same race data are not available for multiracial students because we do not know their specific race/ethnicity.

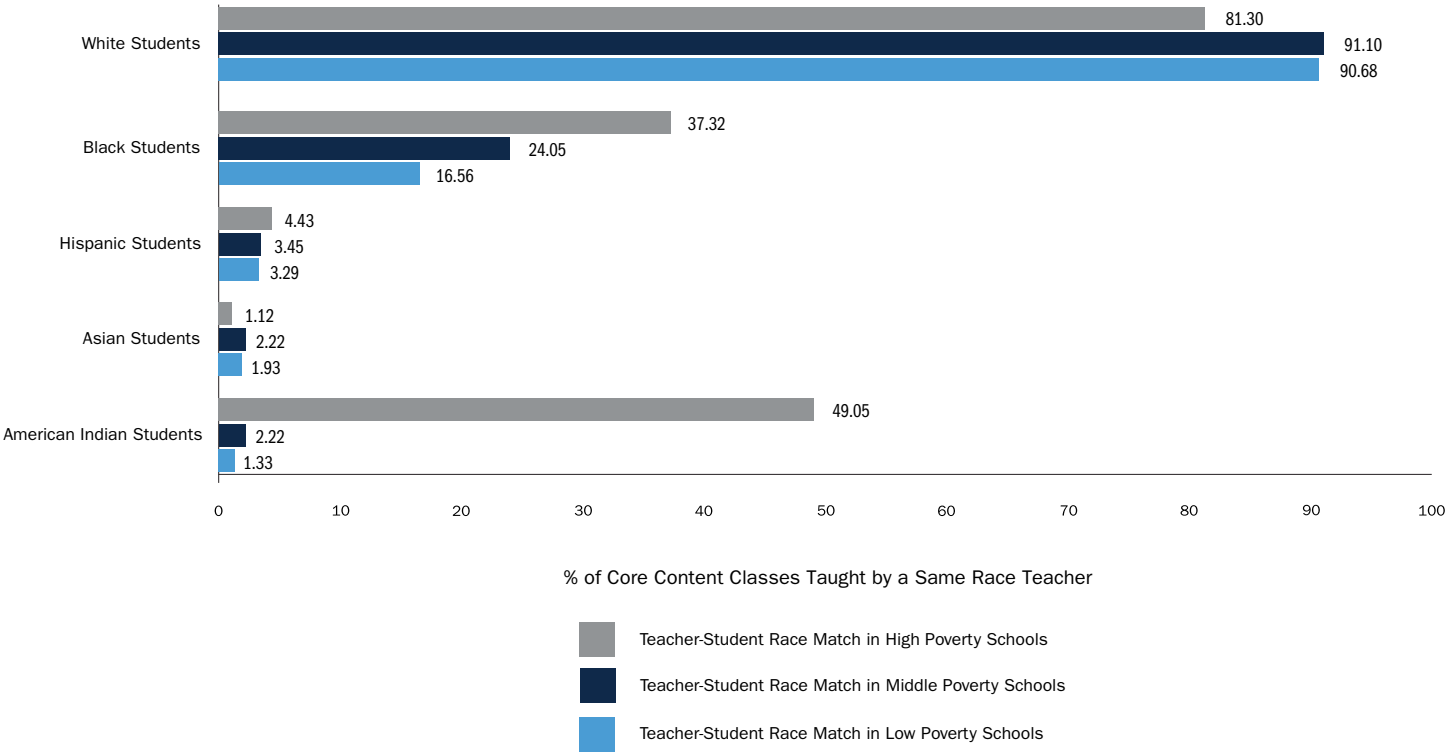
for approximately 60–67 percent of the differences in access to effective teachers. For example, of the 27 percent of a standard deviation difference in the prior-year EVAAS estimates of those teaching high-performing versus low-performing students (Figure 1, Panel D), 59 percent of that difference is due to variation in the EVAAS estimates of teachers working at different schools in the same district. Second, although between school mechanisms account for the largest share of variation in access to well-credentialed and effective teachers, there are still meaningful differences explained by between district and within school mechanisms. For example, between district variation accounts for nearly 38 percent of the difference in exposure to first-year teachers for students who are White and non-economically disadvantaged versus Black and economically disadvantaged. Within school variation accounts for 20 percent of the difference in exposure to NBC teachers for White non-economically disadvantaged students versus Hispanic economically disadvantaged students.

What is the distribution of diverse teachers in North Carolina?

As North Carolina's student body becomes increasingly diverse, state and local officials are interested in recruiting and retaining more teachers of color. This is especially important given research showing that students rate teachers of color higher than White teachers and that same-race teachers improve outcomes for students of color. To motivate efforts to diversify the state's workforce, Figure 4 presents the percentage of students' core content classes taught by White teachers, teachers of the same race/ethnicity as the student, and other teachers of color.

Overall, White students are the most likely to be taught by a same race teacher—90 percent of their core classes are taught by a White teacher and 10 percent are taught by a teacher of

Figure 5. Access to a Diverse Teacher Workforce—By School Poverty Status



Note: This figure displays the percentage of core content area classes taught by a teacher who matches the race/ethnicity of the student. Data are presented for high-poverty schools (top quartile of economically disadvantaged students), middle-poverty schools (middle two quartiles of economically disadvantaged students), and low-poverty schools (bottom quartile of economically disadvantaged students). Same race data are not available for multiracial students (excluded from the figure) because we do not know their specific race/ethnicity.

color. By comparison, the percentage of core classes taught by a same race teacher is 26 percent for Black students, four percent for Hispanic students, two percent for Asian students, and 32 percent for American Indian students. Instead, these students of color most often have White teachers for their core content classes—e.g. 69 percent for Black students, 77 percent for Hispanic students, and 82 percent for multiracial students.[7]

As with our analyses on the distribution of well-credentialed and effective teachers, we recognize that the likelihood of having a same race teacher may vary by school characteristics. In response, Figure 5 displays the percentage of core content classes taught by a same race teacher in high, middle, and low-poverty schools. Unsurprisingly, the data show that White students in high-poverty schools have a lower percentage of core classes taught by a same race teacher than their White peers in low-poverty schools (81 versus 91 percent, respectively). Conversely, Black students in high-poverty schools have a much higher percentage of their core classes taught by a same race teacher than Black students in low-poverty schools (37 versus 17 percent, respectively). Given the relatively small percentage of Hispanic and Asian teachers in North Carolina, results for Hispanic and Asian students are generally unchanged across school poverty levels. Lastly, results show that American Indian students are much more likely to be taught by an American Indian teacher in a high-poverty school.

Discussion

To successfully confront educational inequities, state and local officials need data and evidence to inform decision making. With this motivation, we assessed the distribution of well-credentialed, effective, and diverse teachers in North Carolina.

[7] For multiracial students, we cannot identify the percentage of core content classes taught by a same-race teacher because we do not know the specific race/ethnicities of the student.

Across *each* measure that we considered—exposure to first-year and NBC teachers, prior-year NCEES ratings, prior-year EVAAS estimates—we find that students from historically marginalized populations have less access to well-credentialed and effective teachers. These differences in access are meaningful in size and add up over the course of a student's K–12 education. For example, if students were to take four content classes each year, from kindergarten through 12th grade, we project that White non-economically disadvantaged students would have a first-year teacher 2.8 times and an NBC teacher 7.5 times. By comparison, a Black economically disadvantaged student would have a first-year teacher 5.6 times and an NBC teacher 3.5 times. When considering gaps in NCEES and EVAAS, it is as if North Carolina consistently assigns students from historically marginalized populations to first-year teachers and advantaged students to those with one or more years of experience. Quite simply, the distribution of teachers in North Carolina compounds inequalities for those who are economically disadvantaged, of color, or low-performing.

We find that the largest source of variation in access to well-credentialed and effective teachers is between schools in the same district. Certain schools—high-performing schools, low-poverty schools—have more well-credentialed and effective teachers. Although smaller in magnitude, there are also meaningful differences in access to teachers between districts and within schools. This indicates that certain districts better attract and retain effective teachers and that, within schools, advantaged students are more likely to have effective teachers.

Lastly, we find large mismatches between the demographics of K–12 students and teachers. This matters given the benefits of a diverse teacher workforce. White students frequently have same-race teachers in their core content classes. By comparison, it is rare for students of color to have a same-race teacher. This is especially true for Hispanic students, who make up nearly 19 percent of the K–12 population yet have a same-race teacher in less than four percent of their core classes.

These results suggest that policymakers should prioritize efforts to strengthen teacher recruitment, teacher retention, and school working conditions, especially in high-priority schools and for teachers of color. At the *state* level, examples of such policies include funding for larger teacher salary supplements and targeted teacher recruitment and retention bonuses, greater investment in teacher preparation at the state's minority serving institutions (MSIs), the promotion of teacher leadership roles, and initiatives to improve and diversify school leadership. At the *district* level, examples of such policies include reallocating funding for targeted recruitment and retention bonuses and partnerships with teacher preparation programs (especially with MSIs) to strengthen clinical experiences and the preparation to employment pipeline. Given that the inequitable distribution of teachers is related to student enrollment at neighborhood schools, *districts* could also explore assignment practices that reduce the concentration of students from historically marginalized populations in schools. Lastly, at the *school* level, our results highlight the role of principals and leadership teams in more equitably assigning well-credentialed and effective teachers to students from historically marginalized populations.

For More on This Topic

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