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About HERC. Focusing on the most pressing challenges facing the region, the Houston Education Research Consortium (HERC) is a researchpractice partnership between Rice University and 11 Houston-area school districts. HERC research is developed directly alongside district leaders with findings shared with decision makers-culminating in long-term, equity-minded solutions, opportunities and growth for Houston and beyond.

# Achieving Equity in Access to Qualified Teachers in HISD 

This study analyzed the equitable distribution of qualified teachers across schools in the Houston Independent School District (HISD) in the 2018-19 and 2019-20 school years. It examined how the characteristics of teachers were distributed in schools relative to the characteristics of the students attending those schools. For each HISD campus, the study assessed the percentage of teachers who have advanced degrees; the percentage of teachers with certifications in special education (SPED), English as a Second Language (ESL) or Bilingual Education; the percentage of teachers who have a background in education; and the average years of teaching experience. Findings showed that HISD teachers with certifications in SPED and ESL/Bilingual Education were equitably distributed across the campuses where students needed them most. However, HISD can improve the distribution of teachers with a formal background in education, advanced degrees, and more years of teaching experience.

Given the racial/ethnic diversity of HISD students and teachers, this study also examined the extent to which the racial/ethnic makeup of students resembled that of the teachers in their schools. The study found that schools with the highest proportions of Black or Hispanic students also had the highest proportions of Black or Hispanic teachers respectively, meaning that Black or Hispanic students attending schools where they are the majority were more likely to be taught by teachers who looked like them.

## Key Findings

## HISD equitably distributes teachers with certifications in Special Education and ESL/ Bilingual Education based on student need.

- Schools with the highest proportions of Special Education (SPED) students also had more teachers certified in SPED.
- Schools with the highest proportions of English learner (EL) students had more teachers certified to teach ESL and/or Bilingual Education.


## HISD can improve equity in its distribution of

 teachers with more teaching experience, a formal background in education, and advanced degrees.- Nine out of 10 schools in HISD are Title 1 schools. However, Title 1 schools had less experienced teachers and fewer teachers who had a formal background in education relative to non-Title 1 schools.
- Schools with the highest proportions of Black students had the highest proportions of teachers with advanced degrees but also less experienced teachers.
- Schools with the highest proportions of Hispanic students had teachers with more experience but also fewer with advanced degrees.


## The availability of Black and Hispanic teachers in HISD schools was highest on campuses with more Black and Hispanic students, respectively.

The Houston Independent School district (HISD) is the largest school district in the state of Texas and has a more diverse student and teacher population relative to other districts in the state. Similar to the racial/ ethnic composition of HISD students ( $24 \%$ Black, $44 \%$ Hispanic), about two-thirds of teachers are Black or Hispanic ( $35 \%$, 31\%, respectively) (NCES 2021). Because of its racially and ethnically diverse teacher and student populations, HISD can ensure educational equity by distributing highly qualified and diverse teachers based on student needs across schools. To assess the equitable distribution of teachers in the district, this study examined their qualifications and their racial/ethnic background.

## Equitable Distribution of Teacher Qualifications

An important means of ensuring educational equity across schools is guaranteeing that students with the greatest need have access to high-quality teachers. Measures of teacher quality often include advanced degree attainment, formal background in education, certification status, and years of teaching experience, all of which are associated with students' educational success (Darling-Hammond 1999; Rowan et al. 2002; Wayne and Youngs 2003; Kukla-Acedevo 2009). Other indicators of teacher quality also include having a degree and/or certification in the subject(s) they teach or in teaching students with specific needs (e.g., students in special education (SPED), English learners (EL)) (Skrla et al. 2009).

Racial/ethnic minority students and those from socioeconomically disadvantaged backgrounds most often have teachers who have less experience and education, lack certifications, or teach outside their areas of expertise (Ladson-Billings 1997; Ingersoll 1999; Lankford et al. 2002; Darling-Hammond 2013). Given the evidence that students benefit from highly qualified teachers, we examined whether there was an equitable distribution of teachers with particular qualifications across HISD schools, based on student need and the makeup of the schools where they teach.

## Availability of Diverse Teachers for a Diverse Student Population

Black and Hispanic students having teachers of the same race/ethnicity is positively associated with achievement outcomes (Egalite et al. 2015; Wells et al. 2016; Joshi et al 2018; Yarnell \& Bohrnstedt 2018) and behavioral outcomes (Downey \& Pribesh 2004; Blake et al. 2016; Wright et al. 2017; Lindsay \& Hart 2018). Additionally, a greater availability of teachers with similar backgrounds as their students provides students with an opportunity to have mentors and advocates, as well as adult role models of their own race or ethnicity (Redding 2019; Lindsay \& Hart 2017; Egalite, Kisida \& Winters 2015).

A district with diverse populations of teachers and students such as HISD presents a unique opportunity to explore the availability of Black and Hispanic teachers across schools with varying proportions of Black and Hispanic students. Importantly, understanding these patterns is essential to ensure students have equitable access to potential mentors, advocates and role models in the schools they attend.

## Background

## Research Questions

This brief explores how teacher characteristics were distributed across HISD, specifically:

1. How are campus-level teacher qualifications distributed across HISD campuses relative to student need?
2. How are Black and Hispanic teachers distributed across HISD campuses based on the shares of Black and Hispanic students attending each campus?

## Data and Method

To address these questions, this study presents descriptive analyses based on information from multiple sources of HISD administrative data (Public Education Information Management System, PEIMS) on 262 HISD campuses for the 2018-19 and 2019-20 school years.

To examine how equitably distributed teachers are across campuses in HISD, the qualifications of teachers at a campus were compared to the characteristics of students enrolled at that campus.

Our analyses focused on the characteristics of teachers in relation to the characteristics of the student body at each campus. For our measures of HISD teachers' professional qualifications at the school level, we used the variables described in Table 1. These variables indicate whether each of the teacher qualifications met or exceeded a particular threshold on a campus. The thresholds were set such that one-quarter of HISD campuses would be above the threshold and three-quarters would be below. For instance, a quarter of HISD campuses employ a pool of teachers in which $25 \%$ or more teachers have an advanced degree, whereas in three-quarters of HISD campuses, the share of teachers with advanced degrees is lower than $25 \%$. As shown in Table 1, each variable has its own percentage cutoff based on these criteria.

## table 1 Teacher Qualifications at the School Level

| Advanced Degrees | $25 \%$ or more of teachers on a campus with an advanced degree |
| :--- | :--- |
| Formal Background in Education | $25 \%$ or more teachers at a campus majored and/or minored in education related field |
| SPED Certification | $15 \%$ or more teachers with SPED certification |
| ESL/Bilingual Certification | $50 \%$ or more teachers with ESL/Bilingual certification |
| Above-Average Teaching Experience | The average years of teaching experience at a campus is above the district average (12 years) |

## table 2 Teacher Characteristics at the School Level

| Race/Ethnic Background | Low Shares | Moderate Shares | High Shares |
| :--- | :---: | :---: | :---: |
| \% Black Teachers | $0-13 \%$ | $14-64 \%$ | $65 \%$ or more |
| \% Hispanic Teachers | $0-16 \%$ | $17-55 \%$ | $56 \%$ or more |
| Professional Qualifications | Low \& Moderate Shares | High Shares |  |
| \% Teachers with Advanced Degrees | $0-24 \%$ | $25-50 \%$ |  |
| \% Teachers with Formal Background in Education | $0-24 \%$ | $25-67 \%$ |  |
| \% Teachers with SPED Certifications | $0-14 \%$ | $15-100 \%$ |  |
| \% Teachers with ESL/Bilingual Education | $0-49 \%$ | $50-90 \%$ |  |
| Average Years of Teaching Experience | $0-12$ years | $13-23$ years |  |

## table 3 Student Characteristics at the School Level

|  | Low Shares | Moderate Shares | High Shares |
| :--- | :---: | :---: | :---: |
| \% Black Students | $0-5 \%$ | $6-49 \%$ | $50 \%$ or more |
| \% Hispanic Students | $0-33 \%$ | $34-90 \%$ | $91 \%$ or more |
| \% Students in SPED | $0-6 \%$ | $7-10 \%$ | $11 \%$ or more |
| \% Students who are EL | $0-15 \%$ | $16-54 \%$ | $55 \%$ or more |
| Title 1 Status | $40 \%$ or more students receive free/reduced lunch |  |  |

In addition, we used indicators of school-level race and ethnicity for both teachers and students, as well as indicators of economic disadvantage, special education, and English learner status for students in each school. We then categorized campuses based on whether they had low, moderate, and high shares of students and teachers with these characteristics (Tables 2 and 3 ).

More information on the data and variable definitions can be found in Appendix A.

## Key Findings

Teachers with certifications in SPED and ESL/Bilingual education were equitably distributed based on student need.
figure 1 Campuses With High Shares of SPED Students Were More Likely to Have 25\% or More of Their Teachers Certified in SPED


Source: HISD 2018-20, PEIMS 2018-20

As shown in Figure 1, 72\% of HISD schools with high shares of SPED students had an above-average proportion - $15 \%$ or more - of teachers with certifications in SPED. This percentage was about three times that of HISD schools with a moderate proportion of SPED students, and about eight times as that of HISD schools with a low proportion of SPED students. This means that schools with the most SPED students have access to the highest share of SPED certified teachers.

| Figure | 2 Campuses With High Shares |
| :--- | :--- | of EL Students Were More Likely to Have 50\% or More Teachers Certified in ESL/ Bilingual Education



Source: HISD 2018-20, PEIMS 2018-20

Turning to Figure 2, schools with high proportions of EL students were more likely to have $50 \%$ or more teachers certified to teach ESL/Bilingual Education. Nearly 60\% of HISD schools with high proportions of EL students have an above-average proportion of teachers with certifications in ESL/Bilingual Education. This percentage was twice that of HISD schools with moderate proportions of EL students, and nearly three times that of schools with low proportions of EL students.

## 2 <br> Title 1 schools had teachers with less experience and fewer teachers with a formal background in education.

| figure | $3 \quad$ Non-Title 1 Schools Were More |
| :--- | :--- | Likely Than Title 1 Schools to Have a Higher Proportion of Teachers with Above-Average Years of Teaching Experience



Source: HISD 2018-20, PEIMS 2018-20

Figures 3 and 4, respectively, show inequities between non-Title 1 and Title 1 schools when it comes their teachers' years of teaching experience and having a formal background in education.

About 1.5 times as many non-Title 1 schools had teachers with above-district-average years of teaching experience as Title 1 schools ( $45 \%$ vs. 29\%) (Figure 3).
figure 4 About Twice as Many NonTitle 1 Schools Had 25\% Or More Teachers with A Formal Background in Education

Source: HISD 2018-20, PEIMS 2018-20

About twice as many non-Title 1 schools had a quarter or more of teachers with a formal background in education than Title 1 schools ( $47 \%$ vs. $24 \%$ ) (Figure 4).

It is important to note that in HISD, nine out of 10 schools had Title 1 status between 2018 and 2020 ( $90 \%$ in 2018-19 and 91\% in 2019-20), so these inequities in the availability of experienced teachers and teachers with a background in education had an impact on the vast majority of students in the district. teachers but fewer with advanced degrees.

| FIGURE | 5 | Schools With the Highest <br>  <br>  <br>  <br>  <br>  <br>  <br> Percentage of Hispanic Students <br> Had Teachers with Experience <br> Above the District Average |
| :--- | :--- | :--- |



Source: HISD 2018-20, PEIMS 2018-20

## Teaching Experience

Schools with the highest proportions of Hispanic students had more teachers with above-average years of teaching experience. Specifically, $42 \%$ of schools with the highest proportions of Hispanic students had above-district-average years of teaching experience (Figure 5). This percentage was about 1.5 times than that of schools with the lowest (33\%) and middle (26\%) proportions of Hispanic students.


Source: HISD 2018-20, PEIMS 2018-20

## Advanced Degrees

Figure 6 shows that schools with the highest proportions of Hispanic students had fewer teachers with advanced degrees. Only $8 \%$ of schools with the highest proportions of Hispanic students had $25 \%$ of more teachers with an advanced degree. Conversely, among schools with the low and moderate proportions of Hispanic students, the percentage of schools where a quarter or more teachers had advanced degrees was three times that of schools with the highest proportions of Hispanic students ( $31 \%$ and $33 \%$, respectively).

## figure 7 7 Schools With High Proportions of Black Students Were More Likely to Have High Proportions of Teachers with Advanced Degrees



## Advanced Degrees

Figure 7 shows that schools with moderate and high proportions of Black students have more teachers with advanced degrees. More than one-third of campuses with high shares of Black students had high shares of teachers with advanced degrees. This percentage was five times that of schools with low proportions of Black students.


Source: HISD 2018-20, PEIMS 2018-20

## Teaching Experience

Figure 8 shows how the proportion of schools where the average years of teaching experience was above-dis-trict-average ( 12 years or more) was distributed based on the proportion of Black students in those schools. Less than one-third of schools with high proportions of Black students had teachers with above-district-average teaching experience. In contrast, in schools with low proportions of Black students, over 1 in 4 had teachers with experience above the district average. This number is about 1.5 times that of schools with high and moderate proportions of Black students ( $44 \%$ vs. $27 \%$ ). greatest availability of Black and Hispanic teachers, respectively.
figure 9 Campuses With the Highest Proportions of Black Students Also Had the Highest Proportions of Black Teachers


Few Black Students \& Teachers - Some Black Students \& Teachers

- Most Black Students \& Teachers

Source: HISD 2018-20, PEIMS 2018-20

## Availability of Black Teachers based on Proportion of Black Students

Figure 9 shows how proportions of Black teachers were distributed across HISD schools based on the proportion of Black students in the schools. In HISD schools, the availability of Black teachers was aligned with the proportion of Black students. The horizontal axis indicates the percentage of Black students, and the vertical axis is the percentage of Black teachers. The availability of Black teachers aligned with the proportion of Black students across campuses, meaning that schools with the lowest proportion of Black teachers were also the schools with the lowest proportion of Black students (light blue dots). Conversely, schools with the largest proportions of Black students also had the largest proportions of Black teachers (dark blue dots).

## figure 10 Campuses With the Highest Percentage of Hispanic Students Also Had the Highest Proportions of Hispanic Teachers



Source: HISD 2018-20, PEIMS 2018-20

## Availability of Hispanic Teachers based on Proportion of Hispanic Students

Figure 10 shows that schools with the highest proportion of Hispanic students also had the most Hispanic teachers. The horizontal axis indicates the percentage of Hispanic students, and the vertical axis is the percentage of Hispanic teachers. The availability of Hispanic teachers was aligned with the proportion of Hispanic students across campuses, which means that schools with the lowest proportions of Hispanic students were also the schools with the lowest proportions of Hispanic teachers (light blue dots). Campuses with the highest proportions of Hispanic students also had the highest proportions of Hispanic teachers (dark blue dots).

## Conclusion

## Implications

This study shows HISD's distribution of teachers across schools is equitable in some ways but not others. Teachers with SPED and ESL/Bilingual certifications, respectively, were distributed in schools with the most SPED and EL students. However, there is room for improvement when it comes to the distribution of teachers with advanced degrees, a formal background in education, and above-average years of teaching experience.

The results suggested that schools with the highest proportions of students with particular needs, such as special education or language support, provided their students with the most access to teachers certified to teach them. While this finding provides evidence that staffing across the district is responsive to campus needs, our study does not explore whether the availability of teachers with specific certifications is adequate. Thus, future work would be needed to explore that. We also find that Title 1 schools had teachers with less teaching experience. This finding was consistent with previous research that indicated more senior teachers tended to teach in schools with more students from economically advantaged backgrounds, whereas novice teachers tended to teach in schools with more economically disadvantaged students (Ingersoll 1999; Lankford et al. 2004; Skrla et al. 2004). If HISD identifies teacher experience as an area in which they hope to achieve greater equity across campuses, policies may be needed to address this. Some recent initiatives the district has implemented are good examples, such as pay raises and
retention incentives. Further approaches may include specific incentives to attract and retain experienced teachers. Similarly, if HISD identifies having teachers with specific training in education as a goal, teacher recruitment or retention efforts should consider teacher qualifications in order to increase the equitable distribution of these teachers across campuses.

Schools with more Black and Hispanic students had a corresponding high proportion of Black and Hispanic teachers. Previous work on the racial composition of teachers and students has shown that at the individual level, Black and Hispanic students having teachers of their same race or ethnicity can be beneficial for academic (Egalite et al. 2015; Wells et al. 2016; Joshi et al 2018; Yarnell \& Bohrnstedt 2018) and behavioral outcomes (Downey \& Pribesh 2004; Blake et al. 2016; Wright et al. 2017; Lindsay \& Hart 2018). However, previous research also has found teachers of color were more likely to teach in under-resourced, mostly minority schools as well as schools with more students in need of additional support, wiping away the potential positive effects of having a greater availability of teachers of the same race or ethnicity as their students (Frankenberg 2009). Thus, it is important to explore whether having more teachers of the same racial/ethnic background as their students has an impact on student outcomes. The next study in this series will examine the relationship between teacher characteristics and academic and behavioral outcomes to help HISD identify areas it may want to prioritize when it comes to hiring and shaping the distribution of teachers across campuses.


## Recommendations

Findings from this study can help inform HISD's efforts to recruit and retain teachers and to ensure teachers are equitably distributed according to their characteristics. From this work, we highlight three recommendations:

- If HISD identifies teacher experience as an area in which they hope to achieve greater equity across campuses, the district may need to establish policies that prioritize hiring and retaining more experienced teachers. These may include competitive pay, retention and hiring bonuses, and specific incentives for more experienced teachers. HISD has already begun increasing pay and providing incentives to teachers who remain in the district; approaches that incentivize more experienced teachers to remain in the district can be integrated into existing programs.
- If HISD considers having teachers with specific qualifications to be a goal, in addition to recruitment, it may need to prioritize efforts to provide the training and certifications to increase the equitable distribution of these teachers across campuses. This could include further investment in

HISD's Alternative Certification Program, as well as targeted incentives for teachers to attain some of the most needed certifications (i.e., Bilingual/ESL and SPED).

- In order to achieve these goals, HISD would need to provide resources and support to individual campuses making hiring, retention, and training decisions. HISD would need to include campus leadership in any efforts to design interventions to increase equity in the distribution of qualified and experienced teachers. In addition, these priorities would need to be reflected in budgeting decisions and salary policy development.


## Appendix A. Data and Method

## Data

Multiple data sources were utilized to construct a school-level file detailing student characteristics and teacher characteristics. First, for student characteristics, student-level data were aggregated from the Public Education Information Management System (PEIMS) from the Texas Education Agency (TEA). Second, for teacher characteristics, teacher-level data were aggregated from HISD. The resulting dataset was organized in a school-year format, with 262 HISD schools with complete information having two years of data, the 2018-19 to 2019-20 school years. The final analytic sample included 524 school-year observations. Only HISD schools with complete information across the variables of interest were used in the analysis. Each of these samples included elementary, middle and high schools.

## Variables

The following school characteristics were included in the analyses:

## Outcomes: School-Level Teacher Qualifications

Schools that have >=25\% of teachers with advanced
Degrees: a binary variable that indicated whether a school had at least $25 \%$ of teachers with a master's or doctorate degree. The variable was coded as 1 if the school met the threshold or 0 if not. This cutoff was based on the distribution of HISD teachers with advanced degrees, based on the 75th percentile, which was about $25 \%$.

Schools that have >=25\% of teachers with a formal background in education: a binary variable that indicated whether a school had at least $25 \%$ of teachers who
have a formal background in education. This variable was based on teachers' reported majors and/or minors in college. The variable was coded as 1 if the school met the threshold or 0 if not. This cutoff was based on the distribution of HISD teachers with a formal background in education, based on the 75th percentile, which was about $25 \%$.

Schools that have $>=\mathbf{1 5} \%$ of teachers with a certification to teach SPED: a binary variable that indicated whether a school had at least $15 \%$ of teachers certified to teach SPED. The variable was coded as 1 if the school met the threshold or 0 if not. This cutoff was based on the distribution of HISD teachers with a certification to teach SPED, between the 50th percen-tile ( $12 \%$ of teach-ers with the SPED certification) and the 75 th percentile ( $17 \%$ of teachers with the certification).

Schools that have $>=\mathbf{5 0} \%$ of teachers with a certification to teach ESL/Bilingual Education: a binary variable that indicated whether a school had at least $50 \%$ of teachers certified to teach ESL/Bilingual education. The variable was coded as 1 if the school met the threshold or 0 if not. This cutoff was based on the distribution of HISD teachers with the ESL/Bilingual certification, be-tween the 50th percentile (about 40\% of teachers with the ESL/Bilingual Certification) and the 75 th percentile (about $53 \%$ of teachers with the certification).

Schools with teachers that have an average of $>=12$ years of teaching experience: a binary variable that indicated whether the average years of total teaching experience (within and outside of HISD) at the school level was at least 12 years. This cutoff was based on the 75th percentile of HISD teachers' all years of teaching experience.


## Predictors of Interests: School-Level Teacher \&

## Student Characteristics

To categorize school-level and student characteristics, we categorized campuses based on whether they have low, moderate, and high shares of students and teachers with these characteristics in the district. For instance, the graph below shows the bell curve that HERC researchers used to create thresholds for the variable indicating shares of Black teachers within a HISD campus. The values within the left "tail" indicate those that have the low shares of Black teachers. The values within the "bell curve" indicate those that have moderate shares of Black teachers. The right "tail" indicates values that have the high shares of Black teachers.

Percentage of Black Teachers: a three-category variable that indicated the percentage of Black teachers within a school. The first category was schools with a low share of Black teachers ( $0-13 \%$ ). The second category was schools with moderate proportions of Black teachers (14-64\%). The third category was schools with high proportions of Black teachers (65-100\%). This variable ranged from 1 (low) to 3 (high).

Percentage of Hispanic Teachers a three-category variable that indicated the percentage of Hispanic teachers within a school. The first category was schools with a low share of Hispanic teachers ( $0-16 \%$ ). The second category was schools with moderate shares of Hispanic teachers (17-55\%). The third category was schools high shares of Hispanic teachers (56-100\%). This variable ranged from 1 (low) to 3 (high).

## Percentage of Teachers with Advanced Degrees:

a binary indicator for school-level proportion of teachers with advanced degrees. A school assigned 1 for this variable had at least $25 \%$ of teachers at the school who had at least a master's degree. A school assigned a 0 had less than $25 \%$ of teachers at the school with those credentials.

## Percentage of Teachers with a Formal Background

 in Education: a binary indicator for the proportion of teachers who majored or minored in an educational based program. Schools assigned 1 for this variable had 25\% or more teachers have a formal background in education, and schools assigned 0 had less than $25 \%$ of teachers with this credential.
## Percentage of Teachers with Special Education

Certification: a binary indicator of the proportion of teachers certified to teach special education. A school assigned 1 had $15 \%$ or more teachers with a special education certification, and those assigned 0 had less than $15 \%$ of teachers with the certification.

## Percentage of Teachers with English as a Second

 Language/Bilingual Certification: a binary indicator of the proportion of teachers certified to teach English as a Second Language (ESL)/Bilingual Education. A school assigned 1 had at least half or more teachers with the certification, and a school assigned 0 had less than half of teachers with this credential.Years of Teaching Experience: a three-category variable that indicated the percentage of Black students within a school. The first category was schools a low share of Black students ( $0-5 \%$ ). The second category was schools with a moderate share of Black students (6$49 \%$ ). The third category was schools with a high share of Black students (50-100\%). This variable ranged from 1 (low) to 3 (high).

Percentage of Black Students: a three-category variable that indicated the percentage of Black students within a school. The first category was schools a low share of Black students ( $0-5 \%$ ). The second category was schools with a moderate share of Black students (6$49 \%$ ). The third category was schools with a high share of Black students (50-100\%). This variable ranged from 1 (low) to 3 (high).

Percentage of Hispanic Students: a three-category variable that indicated the percentage of Hispanic students within a school. The first category was schools with a low share of Hispanic students ( $0-33 \%$ ). The second category was schools with a moderate share of Hispanic students (34-90\%) The third category was schools with a high share of Hispanic students ( $91-100 \%$ ). This variable ranged from 1 (low) to 3 (high).

Percentage of Students in SPED: a three-category variable that indicated the percentage of students enrolled in SPED within a school. The first category was schools with a low share of students enrolled in SPED (0-6\%). The second category was schools with a moderate share students enrolled in SPED (7-10\%). The third category was schools with a high share of students en-rolled in SPED (11-100\%). This variable ranged from 1 (low) to 3 (high).

Percentage of Students who are EL: a three-category variable that indicated the percentage of students who are ELs within a school. The first category was schools with a low share of students who are ELs ( $0-15 \%$ ). The second category was schools with a moderate share of students who are ELs (16-54\%). The third category was schools with a high share of students who are ELs (55$100 \%$ ). This variable ranged from 1 (low) to 3 (high).

School was Title 1: a binary variable that indicated whether a school could be classified as a Title 1 school, meaning that at least $40 \%$ of students receive free or reduced-price lunch. The variable was coded as 1 if the school met the threshold or 0 if not.

## Method

Researchers used cross-tabulations of school-level teacher qualifications by school-level student characteristics to explore differences across the distributions of these variables. These tabulations were followed by chisquare tests to determine that the differences observed were statistically significant. Whenever statistically significant differences were identified, bar graphs were made to illustrate these differences.

Different visuals were used to demonstrate racial/ethnic concordance between percentage of Black and Hispanic teachers and students. Scatter plots were used to show the full distribution of schools across the race and ethnicity composition of their teachers and students, as well as the extent to which the distributions of these variables were concordant.

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## Mission

The Kinder Institute for Urban Research builds better cities and improves lives through data, research, engagement and action.

## About

The Houston Education Research Consortium (HERC) is a research-practice partnership between the Kinder Institute for Urban Research and 11 Houstonarea school districts. HERC aims to improve the connection between education research and decision making for the purpose of equalizing outcomes by race, ethnicity, economic status, and other factors associated with inequitable educational opportunities.

