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Assessing the Effectiveness of Texas Educator Preparation Programs

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Center for Research, Evaluation and Advancement of Teacher Education (CREATE)
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Executive Summary

The large and diverse field of educator preparation programs (EPPs) in Texas is necessary to serve an equally large and diverse population of public school students. With access to individual, longitudinal data at the University of Houston Education Research Center (UH ERC), this study analyzed EPP outcomes of teacher production, teacher quality and teacher retention with particular attention to the differences between alternative certification programs (ACPs) and university-based programs (UBPs). This study provides a detailed descriptive analysis of Texas EPP participant enrollment, certification, teaching assignments and retention as an important first step in refining the evaluation of EPPs.

Analysis of EPP participants enrolled between 2012 and 2018 found:

- ACPs have become the primary producers of classroom teachers. ACP-prepared teachers in Texas are from more diverse racial and ethnic backgrounds than UBP-prepared teachers and more often teach in middle and high schools with larger populations of economically disadvantaged and minority students.
- On average, 74% of teachers remain in the classroom after five years. UBP-prepared teachers demonstrate higher retention rates than ACP-prepared teachers. Among those who leave the classroom, teachers often move to positions within the public school system.
- Racial and ethnic minority teachers make up less than 50% of EPP participants but demonstrate higher retention rates than their white peers.

The findings of this study suggest several areas for future research regarding EPP evaluation as well as recommendations for Texas EPP policymakers and practitioners:

- Identifying mechanisms that could reverse the trend of declining EPP enrollment, especially in the university-based programs, with special provisions for racial and ethnic diversity and high-need certification areas
- Investigating the most appropriate and suitable means of evaluating teacher quality for accountability
- Exploring the conditions under which teachers leave the classroom for other positions within the public school system and the associated teacher- and student-level outcomes

With these considerations, Texas EPPs will be more likely to meet the increasing demand of the Texas public school system to prepare Texas students for academic and economic success.

Introduction

In Texas, multiple pathways lead to an educator's certification. Texas institutions of higher education provide the more traditional, university-based preparation (UBP) for both undergraduate and graduate students. Additionally, baccalaureate degree holders can receive certification through alternative certification programs (ACPs) provided by not-for-profit education service centers and school districts or for-profit providers (Texas Education Agency, 2019). The alternative certification pathway — originally founded in response to a mathematics and science teacher shortage, which was particularly stifling in rural areas of the state — was created as a new avenue for bachelor's degree holders in 1999. Since that time, ACPs have increased in popularity to become the leading certifier of Texas public school teachers. In fact, in 2015, Texas ACPs were used by more than 50% of all non-university, alternatively prepared teachers in the nation (Van Overschelde & Wiggins, 2017).

With its focus on improving teacher quality, the existence of a state-level data repository for research and its leading production of ACP teachers, Texas is primed for an analysis of preparation programs.

With the increased certification of teachers through alternative pathways comes a need to further explore the short- and long-term outcomes regarding teacher production, effectiveness and retention among EPP program types. In 2014, the American Psychological Association developed a task force to make recommendations for EPP assessment and evaluation. The task force synthesized the existing literature base regarding teacher preparation and outcomes and recommended a three-pronged approach to EPP quality measurement: student achievement, teacher observation and surveys of teacher performance (Worrell, Brabeck, Dwyer, Geisinger, Marx, Noell & Pianta, 2014). Since then, more contemporary literature has illuminated important considerations for some of the specific recommended approaches to measuring EPP quality, namely utility of value-added modeling (Bitler, Corcoran, Domina & Penner, 2019), influences of school climate on teacher and student outcomes (Kraft, Marinell & Yee, 2016) and critical differences between ACPs and UBPs (Van Overschelde & Wiggins, 2017). These latest publications provide an opportunity to revisit EPP evaluation.

To that end, Texas provides the ideal landscape for ongoing and evolving evaluation of EPPs[1]. With its focus on improving teacher quality to buttress a strong economy, the existence of a state-level data repository for research and its leading production of ACP teachers, Texas is primed for an analysis of preparation programs. Thus, the purpose of this study is to serve as an important first step in refining the evaluation of EPPs by providing a detailed descriptive analysis of Texas EPP participant enrollment, certification, teaching assignments, retention and attrition. Leveraging the American Psychological Association's EPP evaluation recommendations while considering critical contemporary literature, this study equips national, state and local policymakers and practitioners with foundational data upon which to base evaluation decisions for both alternative and traditional EPPs, as well as to identify critical additionally needed work. On the basis of these specific aims, this research sought to answer the following questions:

1. How do EPP participants' demographic characteristics differ between ACPs and UBPs?
2. In what ways do certification test scores and certifications awarded vary between ACPs and UBPs?
3. In what ways do characteristics of the campuses that employ first-year teachers vary between EPP types?
4. How does beginner-teacher retention vary between the different types of EPPs?
5. Where do early-career teachers go when they leave the classroom?

[1] For a comprehensive review of the Educator Preparation Program policy history, visit https://www.uh.edu/education/research/institutes-centers/erc/reports-publications/

This study, made possible with access to individual, longitudinal data at UH ERC from the Texas Higher Education Coordinating Board, Texas Education Agency and Texas Workforce Commission, answers these questions regarding educator preparation and effectiveness in Texas. The findings provide educators and EPP providers, researchers and policymakers with information to further develop policy on educator preparation, as well as improve the opportunities and outcomes of all Texas students.

Texas Educator Preparation Program Policy

As necessary context to understand the EPP landscape in Texas, this research began with an extensive review of the statue, rules and regulations governing Texas EPPs, from the formation of the State Board for Educator Certification (SBEC) in 1995 through present day. The following paragraphs briefly summarize the major policy milestones reviewed in full detail in the 2019 UH ERC working paper *A Review of Texas Educator Preparation Program Policy*[2].

In 1995, the Texas Legislature was grappling with meeting the public school system's demand for high-quality teachers to serve a population of 3.5 million students who were becoming more diverse in socioeconomic status, race and ethnicity each year. As one solution to uphold the quality of educators being prepared for the classroom, the legislature created the SBEC (74th Texas Legislature, 1995). This board was not only intended to establish public school teachers as professionals but also grant them authority to govern their profession (Texas Education Code, §21.031). By 1998, the SBEC had created an Accountability System for Educator Preparation to ensure the quality of educators prepared in the state and had begun to regulate the field-based experiences and curricular offerings of EPPs. The following year, the legislature authorized ACPs as a means of filling the growing teacher demand.

When the No Child Left Behind Act of 2001[3] introduced the highly qualified educator standards, the state regulation governing EPPs was amended to comply. These amendments included a change in rule to indicate that ACP participants holding a probationary certificate during their first year of teaching would meet the highly qualified standard. With a federal focus on improving teacher professionalism, SBEC expanded the administrative rules to precisely indicate the types and classes of certifications issued, the certification renewal process and continuing professional education requirements, criminal history reviews for applicants, and the certification required for each teaching assignment. The next major wave of changes to EPP policy came in the mid-to-late 2000s when SBEC and the Texas Education Agency convened stakeholders to comply with federal requirements and clarify existing administrative code. After a series of meetings in 2007 and 2008, admissions criteria were increased, rules were amended to increase EPP standardization in coursework and field experiences, and a consumer-focused website launched to improve transparency in quality among EPPs.

In 2013, in addition to the regularly scheduled review of administra-

EPP Timeline

1995: Texas Legislature creates the State Board for Educator Certification (SBEC).

By 1998: SBEC creates an Accountability System for Educator Preparation to ensure the quality of educators being prepared for the classroom and begins to regulate the experiences and offerings of educator preparation programs (EPPs).

1999: Legislature authorizes alternative certification programs (ACPs) as a means of filling teacher demand.

2001: Congress approves the No Child Left Behind Act; state regulations governing EPPs are amended to comply.

2007-2008: SBEC and the Texas Education Agency convene stakeholders to comply with federal requirements and clarify existing administrative code.

2013: A tri-agency review is held, resulting in the major reorganization of several chapters of EPP administrative code, as well as substantive changes aimed at improving the quality of teachers produced in the state.

2013- 2016: Amendments and additions are created, resulting from the review.

More recently: Rule amendments have focused on improving child safety, changing certification requirements and improving transparency by developing more accountability measures.

[2] https://www.uh.edu/education/research/institutes-centers/erc/reports-publications/
[3] Act, N. C. L. B. (2002). No child left behind act of 2001. *Publ. L*, 107-110.

tive rules, the Texas Legislature mandated a tri-agency review by the SBEC, Texas Education Agency and the Texas Workforce Commission. The goal was to advance educator quality by raising EPP standards, improving teacher education programs and regulating teacher training. The result was a major reorganization of several chapters of EPP administrative code, as well as substantive changes aimed at improving the quality of teachers produced in the state. Ongoing throughout 2016, the amendments and additions resulting from the review included alignment of curricula to appraisal standards, amendments to the types of certifications offered, demonstration of English proficiency, appeal of an EPP revocation, and field-based work and courses required for certification.

Most recently, many rule amendments have focused on improving child safety, with increased requirements for CPR and defibrillator training as well as training on suicide prevention and sexual misconduct. Other rule changes were prompted by the state's change in courses required for graduation, which led to changes in certification requirements. In an effort toward transparency and improved quality, accountability for EPPs has further developed to include principal appraisals, disaggregation of publicly available reports by gender and race, and the quality of field supervision. The following section reviews relevant literature beyond the state boundaries and provides a framework for this study.

Literature Review

The successful preparation of effective educators, both teachers and school administrators, has broad and lasting ramifications for public schools. A large body of empirical evidence has accumulated demonstrating the positive impact effective teachers have on student learning (Ashton,1984; Garet, Porter, Desimone, Birman & Yoon, 2001; Rockoff, 2004; Stronge, Ward & Grant, 2011). The quality of teaching provided over the course of a school year has been found to have a significant effect on student test performance (Goldhaber, 2015; Hanushek, 2011; Rivkin, Hanushek & Kain, 2005). Quality teaching is also associated with long-term schooling outcomes such as increased high school graduation rates, college enrollment and labor market outcomes (Chetty, Friedman & Rockoff, 2014). The short- and long-term effects of teachers on student learning provide the basis for investigation into the preparation of high-quality teachers.

The short- and long-term effects of teachers on student learning provide the basis for investigation into the preparation of high-quality teachers.

Boyd, Grossman, Lankford, Loeb, Michelli and Wyckoff (2006) describe the process of entering and remaining in teaching as an inherently complex one. As such, understanding the decision to begin and remain a teacher requires consideration of not only preparation pathways but also "how teacher background characteristics affect the selection of pathways, how individual characteristics of teachers influence student outcomes, how pathways influence prospective teachers' opportunities to learn, how pathways influence teachers' matching to schools and how characteristics of teachers and their pathways interact with features of school context to influence student outcomes" (p. 158; also Figure 1, p. 159). Thus, in order to effectively evaluate EPPs, individual teacher characteristics and pathways to certification are important considerations (Boyd et al., 2008).

In addition to variance in individual teacher characteristics and pathways to certification, it is necessary that the measurement of EPP quality involves the consideration of differences in EPP programming. This includes subject matter requirements, pedagogy and professional knowledge, field and clinical experiences, and staff/faculty qualifications (National Research Council, 2010).

Beyond preparation programming, when the teaching career outcomes are included in the evaluation of EPPs, school and student characteristics that are known to establish teacher efficacy — such as leadership (Boyd, Grossman, Ing, Lankford, Loeb & Wyckoff, 2011), student population (Chetty, Friedman & Rockoff, 2014) and school climate (Harris & Sass, 2011) — must also be accounted for in evaluation modeling. With a multitude of factors influencing efficacy, which can quickly confound outcomes regarding quality, the evaluation of EPPs is necessarily complex. Much of that complexity is evident in the accreditation standards for EPPs.

As an accrediting body, the Council for the Accreditation of Educator Preparation (CAEP) underscores the importance of continuous, evidence-based improvement that demonstrates educator effectiveness (Council for the Accreditation of Educator Preparation, 2013). CAEP emphasizes the three areas of teacher preparation identified by the National Academy of Sciences (2010): content knowledge, clinical experiences and the quality/selectivity of teacher candidates. By providing standardized definitions and parameters for data collection and outcome variables of interest, CAEP offers guidance to EPPs on evidence collection to determine the extent to which the people who complete their programs impact student learning, development and classroom instruction.

To further support appropriate evaluation of EPPs, in 2014, the American Psychological Association (APA) synthesized research and practice to make recommendations that would optimize implementation of the CAEP accreditation standards. Components are organized into distinct areas: selection, progression, completion and postgrad/workforce (Worrell et al., 2014). Each stage of the process has performance indicators that represent unique activities and experiences that can be quantified, with the ultimate goal of producing educators who can affect K-12 student learning and other desired outcomes. In combination with the CAEP data definitions, the APA recommendations allowed for the actualization of EPP evaluation.

Since the 2014 APA recommendations, evidence from contemporary literature offers further clarity into the utility, appropriateness and precision of EPP and teacher outcome measures. For example, Bitler and colleagues (2019) criticized the precision of commonly used value-added modeling by demonstrating similar teacher impact scores using student standardized test scores and student height as outcome variables.

The descriptive statistics in this study provide an exploration into the complex network of factors influencing the preparation of effective teachers in Texas and lay the groundwork for advances in evaluation modeling.

Important distinctions in the demographic characteristics of teachers who were prepared through different pathways have provided an opportunity to question the recruitment of teachers into preparation pathways (Van Overschelde & Wiggins, 2017). Similarly, investigation into the aspects of school climate related to teacher turnover and student outcomes resulted in revisioning the relationship between key aspects of school climate and outcomes (Kraft, Marinell & Yee, 2016). These examples highlight how the field of EPP evaluation is in a state of development.

In light of recent advances in understanding key outcome measurements posited in literature, the purpose of this study is to serve as an important first step to analyzing the current evaluation of EPPs and advancement of the field. The descriptive statistics in this study provide an exploration into the complex network of factors influencing the preparation of effective teachers in Texas and lay the groundwork for advances in evaluation modeling. By understanding the precise relationships among individual teachers, preparation programs, schools and students, Texas can lead the way in high-quality teacher production and overall student success.

Data

This study accessed data available through UH ERC to examine the relationship among individual teacher characteristics, preparation programs, schools and student characteristics regarding educator preparation effectiveness. UH ERC offers longitudinal, individual-level data, which enabled the researchers to investigate the impact of preparation on educators throughout their careers. This study focused on the selection and progression of participants through the EPP pathway and the employment paths those who completed the programs took over time.

Educator Preparation Program Enrollment

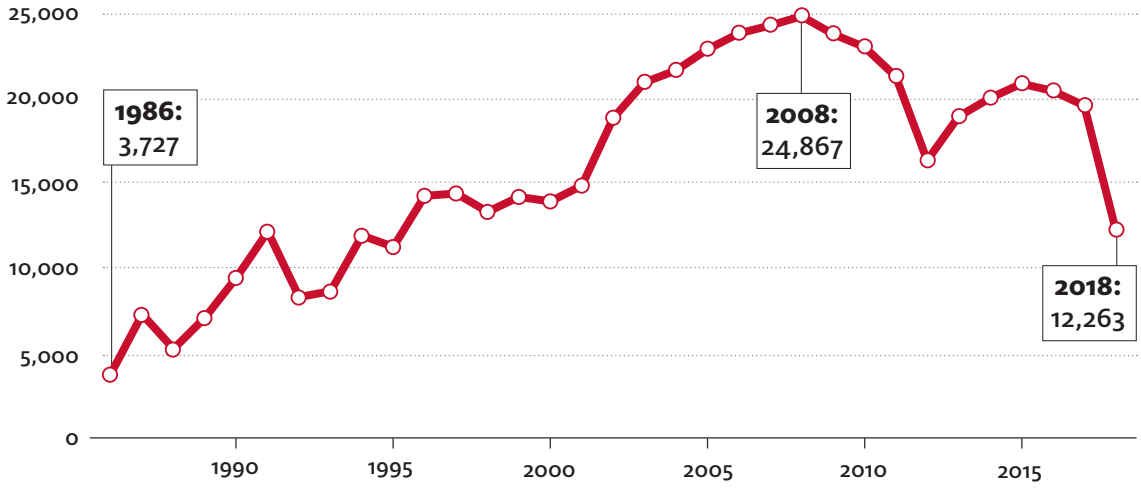
For the purposes of this study, an EPP enrollment dataset was built using the SBEC testing files. Because no EPP program enrollment flag existed in the UH ERC data, the EPP program associated with an individual's first pedagogy test was used as a proxy for program enrollment. All programs require the pedagogy test to be taken, and all individuals must be enrolled in a program to take the pedagogy test; therefore, the EPP with which an individual took their first pedagogy test presented as a sound proxy to allow for the capture of all individuals enrolled into an EPP. Capturing all enrolled participants, as opposed to examining only the participants who received a teaching certification, was necessary for several research questions regarding the participants who never received a certification.

To externally validate the EPP enrollment proxy selected, EPP participant enrollment submitted by EPPs to the Texas Education Agency for accountability purposes was compared to EPP participant enrollment as defined by this study. While the two enrollment counts did not match exactly, the enrollment trends over time were similar. Enrollment counts submitted by EPPs to the Texas Education Agency follow specific definitions regarding program entry dates that were unavailable to researchers on this project; the EPP program enrollment for this study is based in an academic year.

The SBEC file containing all attempts of both pedagogy and content tests was narrowed to the first instance of a pedagogy test for each individual. The EPP associated with each individual's first pedagogy attempt is considered the EPP in which the individual was enrolled. If there was no EPP associated with the individual's first pedagogy test[4], that individual was deleted from the dataset. The final dataset contained 524,059 individ-

FIGURE 1

EPP Enrollment, 1986-2018



Note: EPP enrollment was defined by the academic year of the first attempt of a pedagogy test.

[4] Individuals granted an out-of-state exemption, etc. These individuals totaled 10,036 between 1986 and 2019.

uals who took their first pedagogy test between 1986 and 2018 and were associated with one of Texas' EPPs. Figure 1 on the prior page displays the number of EPP participants per year.

In 1986, there were 3,727 participants in Texas EPPs. By 2008, that number had increased seven-fold to 24,867 participants. Then, after a two-decade trend of overall increase, in 2009, the number of participants in EPPs began to decrease, perhaps influenced by the Great Recession of 2008. The number of participants in EPPs declined through 2011, when the Texas Legislature cut education funding to public schools in the state. From 2012 to 2015, the number of participants in EPPs increased, but then fell again into a trend of decline that has persisted through present day.

For the teacher preparation analyses conducted in this study, the dataset was restricted to the 128,467 EPP participants between 2012 and 2018. The beginning year was chosen because it corresponds with important changes in the administration of the pedagogy tests. Prior to 2012, there were six different pedagogy tests administered to EPP candidates, varying by grade levels served. After 2012, one test (Pedagogy and Professional Responsibilities) was administered to more than 99% of participants[5]. The final year was chosen as 2018 because of data availability.

After a two-decade trend of overall increase, in 2009, the number of participants in EPPs began to decrease, perhaps influenced by the Great Recession of 2008.

Dataset Definitions

EPP program type. A distinction important in all research questions is EPP program type. EPPs were characterized as alternative certification programs (ACPs) or university-based programs (UBPs) using the rules in Appendix A. These rules outline the certification route code defined by the SBEC as either an ACP or a UBP. Generally, any program affiliated with a university or institution of higher education was categorized as a UBP and any program affiliated with an education service center, school district or charter school was categorized as an ACP. In this study, there were 86 ACPs and 75 UBPs. Note that most university-based alternative programs were categorized as UBPs. Appendix B contains a list of each EPP and categorization of ACP or UBP.

School performance. Measuring school performance over the timespan of the teacher preparation dataset presented special challenges. Between 2012 and 2017, Texas developed and implemented not only a new state standardized test — the State of Texas Assessments of Academic Readiness (STAAR) — but also a new state accountability system. In each year, different student-level performance standards for the STAAR test were phased in, and the state accountability rating system contained varying components and cut scores. To that end, two measures of performance were analyzed: state accountability ratings and campus-level student STAAR performance.

When examining state accountability ratings, a binomial distinction was made for "passing" and "failing" because of inconsistencies between years. In 2012, there were no accountability ratings assigned; from 2013 through 2018, campuses were assigned either a *Met Standard* or an *Improvement Required* rating; and in 2019, most campuses were assigned a letter grade in the state's new A-F rating system, although some campuses were still rated under the *Met Standard* and *Improvement Required* rating schema. Thus, given the inconsistency in the system, *Improvement Required* and *F* ratings were considered as "failing" ratings, and all other ratings assigned from 2013 through 2019 were considered "passing." In each year, there are some campuses (e.g., residential treatment facilities, campuses greatly affected by Hurricane Harvey) that were not rated in one or more years between 2013 and 2019. These campuses are indicated as "Not Rated" in this analysis.

Analyzing student performance at the campus level suffered the same systemic inconsistencies as the accountability rating system. However, one component of the rating system remained relatively stable between 2013 and 2019. In each year's accountability rating system, there was a domain or an index that

[5] After 2011, there were 1,320 individuals whose first pedagogy test was the Pedagogy and Professional Responsibilities Trade and Industrial Education. These were removed from the dataset.

averaged the percentage of students meeting each one of three performance standards in a "good," "better," "best" arrangement. Though the performance standards for good, better and best were not consistent over time, Texas considered them equivalent in the accountability rating system. For this reason, the Domain 1 and Index 1 STAAR components were considered equivalent for campus-level student performance. In each year, what will be referred to as the Index 1 score is calculated by averaging the total percentage of tests meeting the "good" performance standard, percentage of tests meeting the "better" performance standard and percentage of tests meeting the "best" performance standard.

Methods

In order to answer the research questions, multiple analytic strategies were employed. Descriptive statistics were produced and analyzed to understand the nature of the data and to explain the variance among the different types of EPPs in the state. In some cases, t-tests were conducted to determine significant differences between populations, and regression was used to understand the influence of program participation on selected outcomes. Specific methods used to answer each question are explained in detail in the Findings section of the paper.

Research Limitations

The methods applied to answer the research questions, conducted using data from the UH ERC, are purely quantitative in nature, and the research questions were limited to the exploration of available data. Much of the UH ERC data analyzed in this study were reported by schools to the Texas Education Agency and the Texas Higher Education Coordinating Board, thus introducing error at each step of the process. In many cases, incomplete or inconclusive data caused individuals to be removed from the dataset (e.g., a missing EPP affiliation or unspecified unique identifier).

In the Data section of this report, specific limitations of available data are discussed in detail. Generally, the limitations of this research are constrained by the changing landscape of the Texas public school system, the definitions applied to the construction of the participation datasets and timing of data released to the UH ERC. Throughout the report, specific dataset restrictions and data availability are discussed as they impact the findings of each individual research question.

Findings

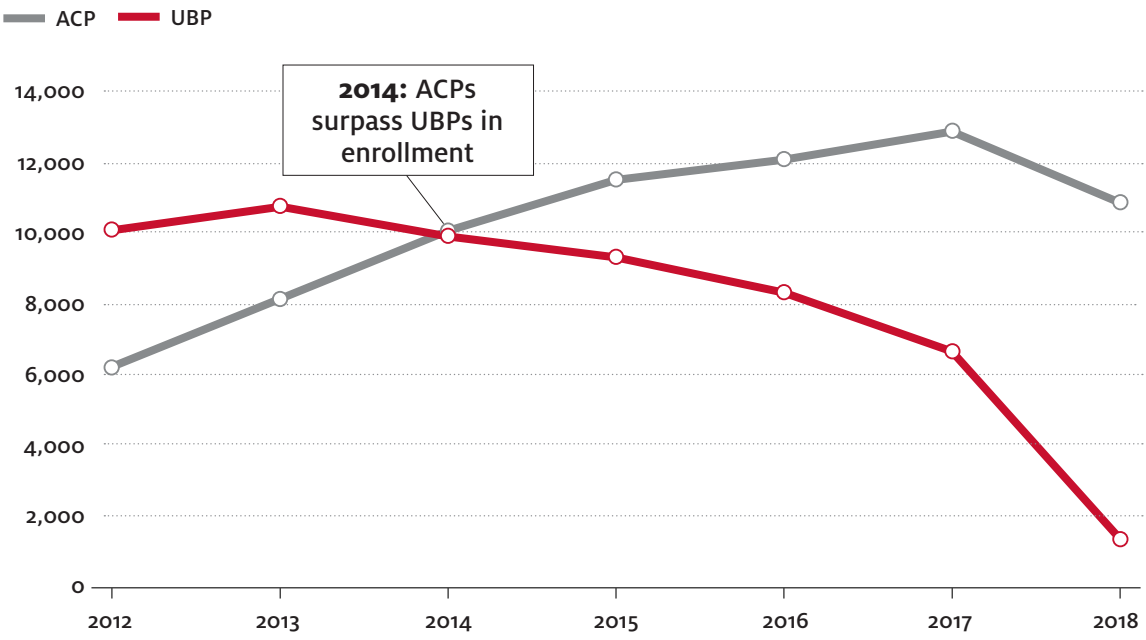
Research Question 1:
How do EPP participants' demographic characteristics differ between ACPs and UBPs?

In order to determine how the characteristics of ACPs and UBPs differed, demographic characteristics were gathered for each of the 128,467 participants enrolled in an EPP in the dataset between 2012 and 2018. Descriptive statistics were then analyzed and are presented in the tables below.

Finding 1: Alternative Certification Programs now enroll the majority of EPP participants. Examining the total EPP enrollment from 2012 through 2018, 71,883 (56%) of all participants were enrolled in an ACP and 56,584 (44%) were enrolled in a UBP. However, when EPP enrollment is examined over time, ACPs did not always enroll the largest number of participants. Figure 2 displays the shifting enrollment trend in EPP types between 2012 and 2018. Prior to 2014, UBPs enrolled the largest number of EPP participants, but in 2014, ACPs surpassed UBPs to enroll the large majority of EPP participants in the state. Count data are included in Appendix C. Also of note is the decline in EPP enrollment from 2017 to 2018. Referring back to Figure 1, there were similar drops in the number of EPP enrollment in 1992, 1995 and 2012.

FIGURE 2

EPP Enrollment by EPP Type, 2012-2018



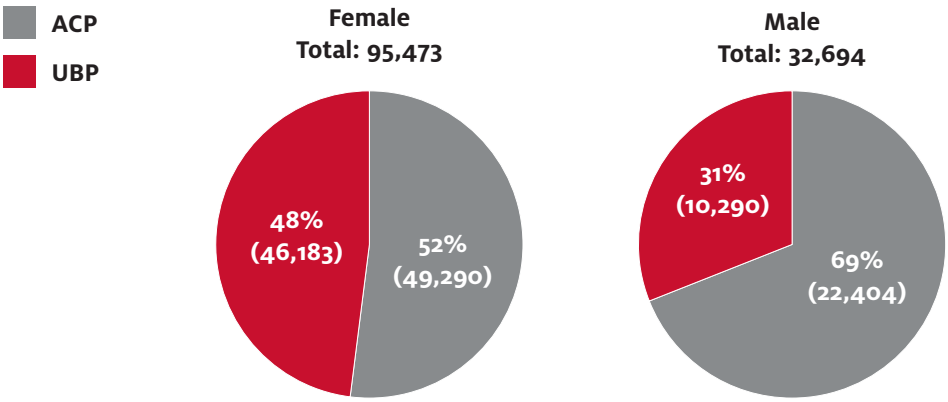
Note: EPP enrollment was defined by the academic year of the first attempt of a pedagogy test.

Finding 2: Male participants are underrepresented in EPP enrollment generally, and most enroll in ACPs. Between 2012 and 2018, 32,694 (26%) of the 128,467 participants enrolled in EPPs identified as male and 22,404 (69%) of them enrolled in ACPs. Figure 3 shows the distribution of male and female participants enrolled in EPPs by type. Female participants are more equally distributed between ACPs and UBPs, as 52% are prepared through an ACP and 48% through a UBP. However, a stark contrast exists in

the male EPP participants in each program type. More than twice the number of male participants were prepared through ACPs (22,404) than UBPs (10,290).

FIGURE 3

EPP Participant Gender, per EPP Type, 2012-2018

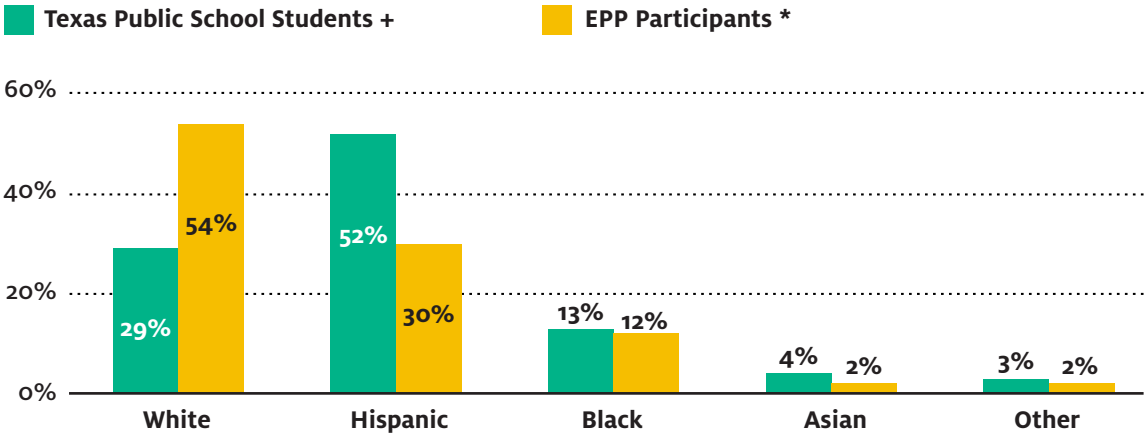


Note: Gender was available for 128,467 EPP participants in the dataset.

Finding 3: The racial and ethnic composition of participants enrolled in an EPP is not a mirror reflection of the Texas public school student population. When the race and ethnicity of the Texas public school student population and that of EPP participants are compared, incongruence emerges. Participants enrolled in EPPs between 2012 and 2018 are largely more white and less Hispanic than the student population. Figure 4 displays the percentage of EPP participants and Texas public school students in each race and ethnicity category.

FIGURE 4

Race and Ethnicity Distribution Among Texas Public School Students and Participants Enrolled in EPPs, 2012-2018

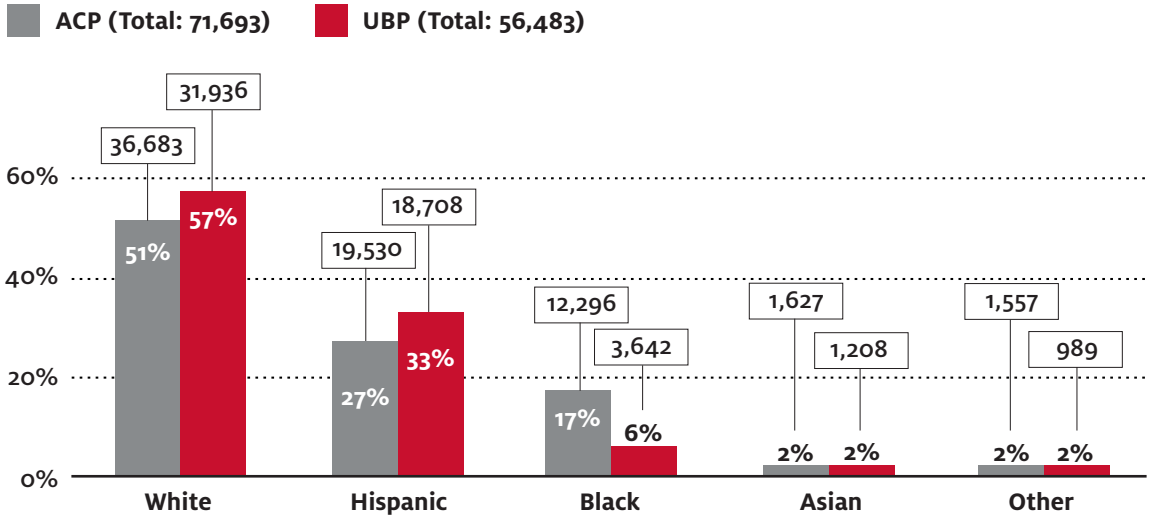


** Race and ethnicity were available for 128,176 EPP participants in the dataset.*
+ Source: Texas Academic Performance Reports and Academic Excellence Indicator System reports, Texas Education Agency

Finding 4: More than three times as many Black participants are enrolled in ACPs than in UBPs. Figure 5 displays the distribution among race and ethnic groups of participants enrolled in ACPs and UBPs between 2012 and 2018. In both the UBPs and ACPs, white participants make up the majority of those enrolled, and the distribution of Asian, Hispanic and other race/ethnic groups is similar within ACPs and UBPs. However, there are more than three times the number of Black participants enrolled in ACPs (12,296) than UBPs (3,642).

FIGURE 5

Distribution of Race and Ethnicities of EPP Participants by Program Type, 2012-2018



Research Question 2: In what ways do certification test scores and certifications awarded vary between ACPs and UBPs?

To understand the differences in Texas Examinations of Educator Standards (TExES) scores between ACP and UBP participants, the pedagogy test scores for participants' first attempts were analyzed. The TExES pedagogy exam has a scale score range of 100 to 300 points, and individuals must score a 240 to pass the exam[6]. Prior to conducting parametric tests, data was tested for normal distribution and skewness. The pedagogy test scores ranged from a minimum of 140 to a maximum of 300. The mean score of all pedagogy test scores in the dataset was 263.93, representing a skewed variable. In order to correct for the skewness of the data, a zero-skewness log transform of the variable was conducted. The transformed variable met both assumptions of normalcy and lack of skewness[7].

Finding 1: Mean pedagogy test scores of ACP participants were slightly higher than pedagogy test scores of UBP participants. When the mean values of the natural log of the skewness-corrected pedagogy test scores of ACPs and UBPs were tested for difference using a two-sample *t*-test with equal variance, the means were statistically significantly different ($t = -2.57$; $p < 0.05$). The actual mean score on the pedagogy test for the ACPs (263.94) was slightly higher than the actual mean score of pedagogy tests taken by UBP

[6] https://tea.texas.gov/sites/default/files/texas_technical_manual_8.31.18.pdf
[7] See Appendix D for histograms of the scale score variable and the zero-skewness log transformed variable.

(263.93) participants. This statistically significant difference indicates little practical significance since the mean scores of both groups are well above the passing standard.

Finding 2: No relationship was found between EPP size and certification exam performance. The mean pedagogy exam scores for EPPs ranged from 237.37 to 286. When the mean score for each EPP was analyzed, there was no meaningful correlation between the number of participants and the pedagogy exam scores (r = 0.014), indicating that the size of the EPP was not related to exam scores.

Finding 3: UBP participants generally score higher on first-attempt content certification exams than ACP participants. The certification types with more than 1,000 total certifications in the dataset, as well as those that were relatively balanced and appropriate for comparison, were selected for display in Table 1 below. The content certification exams included were the participants' first attempt at the exam.

TABLE 1

Selected Content Certification Exam Mean Scores, 2012-2019

	ACP			UBP		
Content Certification	Number	Mean Score	Std Dev	Number	Mean Score	Std Dev
Art EC-12	1,022	265.52	14.31	824	269.98	10.69
Bilingual Education Supp.	673	248.22	17.51	335	251.30	16.76
Bilingual Generalist EC-6	846	232.78	21.27	1,351	238.90	17.01
Bilingual Proficiency-Spanish	1,368	251.72	27.61	1,623	247.66	21.16
ELA and Reading 4-8	1,067	252.76	20.90	550	261.96	16.01
ELA and Reading 7-12	2,395	242.12	24.71	1,286	252.09	18.11
Generalist EC-6	9,751	242.02	20.85	14,952	248.44	17.25
History 7-12	459	241.51	26.47	547	252.37	18.93
LOTE Spanish	1,223	235.15	24.98	560	239.80	21.93
Mathematics 4-8	1,215	247.41	27.24	1,579	257.15	20.58
Mathematics 7-12	1,709	243.87	31.97	1,023	255.34	22.75
Mathematics 8-12	767	241.40	34.01	881	255.05	24.89
Physical Education EC-12	2,501	252.15	20.43	2,922	261.74	15.72
Social Studies 8-12	664	244.38	25.18	594	250.04	19.59

Note: All content certification mean scores demonstrated a statistically significant difference at the $p < 0.05$ level.

In the entire dataset, UBP participants' mean scores were higher in 58 content certification exams, with ACP mean scores higher in Bilingual Generalist 4-8, ESL Supplemental, Health Science Technology Education 8-12, LOTE French, Physics/Mathematics 7-12 and Physics/Mathematics 8-12. As demonstrated in the selected exams expressed in Table 1, the mean score of ACP participants was higher on one exam, Bilingual Language Proficiency-Spanish, which tests the teacher's language proficiency in Spanish and is required to teach Spanish courses.

Finding 4: Most participants who begin an EPP program earn a Standard Teaching Certificate. The certification that marks successful completion of an EPP is the standard teaching certificate. Cohorts of EPP enrollees were tracked through the end of 2018 to determine the highest level of certification received. The results of each cohort are displayed in Table 2. Beginning with the 2012 cohort, 95% of EPP participants received a standard teaching certificate, successfully completing the EPP. Of the total 16,339 participants, 128 (1%) did not receive certification of any kind. Paraprofessional certificates, those preferred for educational aides working in classrooms, were the highest level of certification received for 182 (1%) of participants. It should be noted that these participants could have received a paraprofessional certificate prior to, during or after participation in an EPP but did not receive a standard teaching certificate. Three percent (503) of EPP participants received only a probationary certificate. The probationary certificate as the highest level of certification received is a signal that those students did not complete an ACP. ACPs grant a probationary teaching certificate to EPP participants upon passage of the pedagogy and content certification exams. In lieu of clinical or student teaching hours required by UBPs, probationary certification allows ACP participants to serve as the teacher of record while simultaneously completing the EPP. After completing one year of probationary teaching, the ACP participant can apply for a standard teaching certificate.

TABLE 2

2012-2018 EPP Participants by Highest Level of Certification Received

	Uncertified		Para-professional		Probationary		Standard		Total
Cohort	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**
2012	128	1%	182	1%	503	3%	15,526	95%	16,339
2013	177	1%	202	1%	764	4%	17,794	94%	18,937
2014	133	1%	173	1%	842	4%	18,875	94%	20,023
2015	148	1%	157	1%	1,054	5%	19,515	93%	20,874
2016	161	1%	193	1%	1,235	6%	18,861	92%	20,450
2017	190	1%	299	2%	1,483	8%	17,609	90%	19,581

Note: The 2018 cohort is excluded because it was in progress during the analysis.

Finding 5: The distribution of certifications sought vary between ACPs and UBPs. To understand the differences among the certifications pursued by teachers who were prepared by ACPs versus UBPs, the first certification sought by those teaching in 2019 were examined. Specifically, the 2012-2018 EPP participant dataset was narrowed to only those individuals with certifications who were teaching in 2019. Table 3 displays the total first certifications sought by certification type and EPP type. Of those teaching in 2019, 42,252 (45%) were prepared through a UBP and 51,000 (55%) were prepared through an ACP. Table 3 also displays the largest (>1,000) first-certification subjects sought by 2019 teachers by EPP type.

TABLE 3

Select First Certification Distributions Among EPP Participants Teaching in 2019, by EPP Program Type

	ACP		UBP		Total
	Number	Percent	Number	Percent	
Science •	2,154	70%	902	30%	3,056
Spanish •	751	68%	353	32%	1,104
Social Studies •	2,035	64%	1,143	36%	3,178
Generic Special Ed. •	2,724	64%	1,556	36%	4,280
Bilingual Ed. Supp. •	1,022	63%	594	37%	1,616
Life Science •	744	62%	464	38%	1,208
Art •	856	57%	653	43%	1,509
ELA •	2,971	57%	2,267	43%	5,238
Core Subjects •	4,161	50%	4,144	50%	8,305
Mathematics •	2,598	50%	2,621	50%	5,219
Generalist •	9,292	48%	9,980	52%	19,272
Physical Education •	1,529	41%	2,159	59%	3,688
Bilingual Spanish •	705	40%	1,070	60%	1,775
History •	511	36%	905	64%	1,416
ESL •	2,186	35%	4,019	65%	6,205
Music •	584	21%	2,250	79%	2,834
Total Certifications	**51,000**	**55%**	**42,252**	**45%**	**93,252**

• Denotes certification subjects with statistically significant greater representation in ACPs
• Denotes certification subjects with statistically significant greater representation in UBPs

The distribution of all certifications (45% UBP and 55% ACP) were compared to the distribution among certification subjects using a chi-square goodness-of-fit test. The chi-square tests were conducted to determine the certification subjects with statistically significantly ($p < 0.01$) greater representation in UBPs or ACPs.

In comparison to the population of certifications issued to those teaching in 2019, UBPs prepared larger proportions of teachers with Mathematics, Generalist, Physical Education, Bilingual Spanish, History, ESL and Music certifications. ACPs prepared larger proportions of teachers with Science, Spanish, Social Studies, Generic Special Education, Bilingual Education Supplemental, Life Science, Art, ELA and Core Subjects certifications.

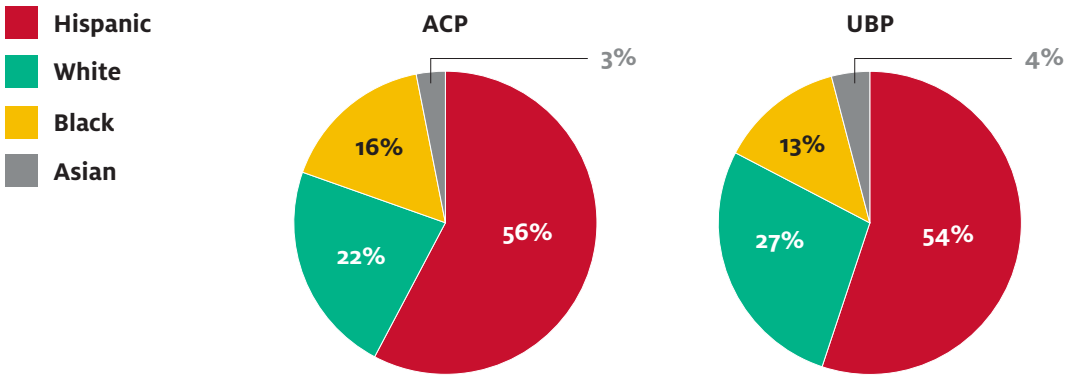
Research Question 3: In what ways do characteristics of the campuses that employ first-year teachers vary between EPP types?

Finding 1: Campuses that employ first-year ACP teachers enroll higher percentages of economically disadvantaged students. Between 2012 and 2019, Texas public schools enrolled an average of 60% economically disadvantaged students[8]. The percentage of economically disadvantaged students served at each campus employing teachers from ACPs and UBPs between 2012 and 2019 were averaged. ACP teachers were employed as first-year teachers at campuses with an average of 67.07% economically disadvantaged students. First-year UBP teachers were employed at campuses with an average of 63.24% economically disadvantaged students.

Finding 2: Campuses that employ first-year ACP teachers enroll higher percentages of Hispanic and Black students and lower percentages of white and Asian students. The percentages of Hispanic, Black, white and Asian students served at campuses employing first-year teachers prepared by ACPs and UBPs were averaged and compared. Figure 6 displays the average percentages of racial and ethnic groups on campuses hiring first-year teachers from each program type. In each of the largest racial and ethnic groups, there were statistically significant differences between ACPs and UBPs. The average campus that hires an ACP-prepared

FIGURE 6

Racial and Ethnic Composition of Campuses Hiring First-Year Teachers by EPP Type, 2012-2019



Note: Statistically significant differences in means for each of the racial and ethnic groups.

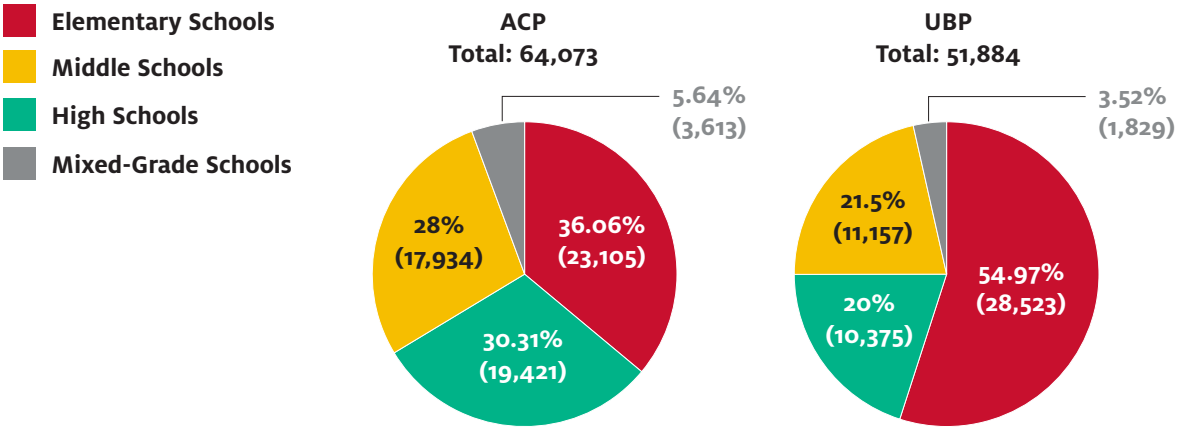
[8] Texas Education Agency statewide reports, 2012-2019. Retrieved from https://tea.texas.gov/texas-schools/accountability/academic-accountability/performance-reporting/texas-academic-performance-reports

first-year teacher serves a larger Hispanic (56%) and Black (16%) student population than the average campus that hires a UBP-prepared first-year teacher (54% Hispanic; 13% Black). The average campus that hires an ACP-prepared first-year teacher also serves a smaller white (22%) and Asian (3%) population of students than the average campus that hires a UBP-prepared first-year teacher (27% white; 4% Asian).

Finding 3: The types of campuses hiring first-year ACP teachers differ from those hiring first-year UBP teachers. The characteristics of campuses that employed first-year ACP and UBP teachers were analyzed. The Texas Education Agency categorizes schools by grade levels served: elementary schools (prekindergarten through fifth grade), middle schools (sixth through eighth grade) and high schools (ninth through 12th grade). Schools serving grade levels spanning two or more of these categories are classified as mixed-grade schools. As displayed in Figure 7, more ACP participants were employed by mixed-grade schools, middle schools and high schools than UBP participants. Figure 7 is limited to 2013 through 2019, as data for 2012 school types was unavailable.

FIGURE 7

School Type Among First-Year Teachers by EPP Program, 2013-2019



Finding 4: The types of campus communities hiring first-year ACP teachers differ from those hiring first-year UBP teachers. The Texas Education Agency categorizes campuses into nine different campus community types. The proportion of ACP and UBP first-year teachers employed by each campus community type is shown in Table 4 below. Particularly, a larger proportion of first-year ACP teachers are employed by charter schools and major urban schools. In fact, of the more than 10,000 first-year teachers employed by charter schools between 2012 and 2018, more than 7,000 were prepared by an ACP.

TABLE 4

Campus Community Type Among First-Year Teachers by EPP Program, 2012-2018

	ACP		UBP	
School Type	Number	Percent	Number	Percent
Major Suburban	20,593	29.61%	16,582	30.64%
Major Urban	14,250	20.49%	9,565	17.68%
Other Central City	9,157	13.16%	8,459	15.63%
Other Central City Suburban	8,127	11.68%	6,810	12.58%
Charter	7,097	10.20%	3,063	5.66%
Non-Metro Stable	3,722	5.35%	3,484	6.44%
Independent	3,672	5.28%	3,270	6.04%
Rural	2,577	3.70%	2,559	4.73%
Non-Metro Fast Growing	364	0.52%	322	0.60%
Total	69,559		54,114	

Finding 5: The campuses of schools hiring first-year ACP teachers are larger than campuses hiring first-year UBP teachers. A third campus characteristic, campus size, was examined by averaging the enrollment of each campus that employed a first-year teacher for both ACPs and UBPs. The average campus employing ACP participants enrolled 1,029 students, compared to 888 students enrolled on the average campus employing UBP participants. This size difference is aligned with the differences in campus types discussed earlier. ACP participants are more often employed as first-year teachers at middle and high schools, which tend to have larger student populations than elementary schools, where more UBP participants are employed in their first year.

Finding 6: The rating of campuses hiring first-year ACP teachers differs from the rating of campuses hiring first-year UBP teachers. The performance ratings of the campuses employing first-year teachers from ACPs and UBPs were reviewed from 2013 to 2018. (Performance ratings were not assigned in 2012.) Special attention was paid to failing campuses, or those receiving a state accountability system rating of *Improvement Required*. Table 5 shows the total number of failing campuses in the state and the number and percentage of first-year teachers hired at these campuses by EPP program type. It should be noted that since 2013, the number of failing campuses has been cut in half. In 2013, there were 768 total failing campuses, which employed 911 (11.44%) of all first-year ACP teachers and 561 (10.35%) of all first-year UBP teachers. By 2018, the number of failing campuses in the state had fallen to 339. There were 527 (5.12%) first-year ACP teachers and 396 (4.54%) first-year UBP teachers hired at these campuses. In each year of the dataset, a larger proportion of ACP participants were first employed at failing campuses than UBP participants, but over time the proportional differences have decreased.

TABLE 5

Percentage of Teachers Hired by Failing Campuses by EPP Program Type, 2013-2018

	Total Failing Campuses	First-Year ACP Teachers at Failing Campuses		First-Year UBP Teachers at Failing Campuses	
Cohort	Number	Number	Percent	Number	Percent
2013	768	911	11.44%	561	10.35%
2014	733	1,374	13.17%	840	8.75%
2015	603	1,280	10.85%	945	9.50%
2016	445	978	8.28%	647	6.95%
2017	358	683	5.80%	424	4.77%
2018	339	527	5.12%	396	4.54%

Research Question 4: How does beginner-teacher retention vary between the different types of EPPs?

Finding 1: After five years, 74% of teachers remain in the classroom. In general, retention among new teachers decreased in a consistent pattern among cohorts beginning their teaching career between 2012 and 2018. Table 6 displays the number of EPP participants who began their teaching year (signaled by the teacher-of-record code in school district Public Education Information Management System, or PEIMS, records) between 2012 and 2018. These cohorts of teachers were followed through 2019. The percentage of those who remained in a teaching role are also displayed in Table 6.

TABLE 6

Teacher Retention by First-Teaching-Year Cohort, 2012-2019

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Cohort	#	%	%	%	%	%	%	%
2012	4,773	91%	81%	74%	68%	64%	60%	54%
2013	13,427	93%	86%	80%	76%	70%	64%	
2014	20,096	93%	86%	81%	76%	69%		
2015	21,814	92%	86%	81%	76%			
2016	21,174	92%	86%	80%				
2017	20,740	92%	86%					
2018	19,059	92%						
Average		92%	85%	79%	74%	68%	62%	54%

On average, 92% of first-year teachers remained in the classroom into Year 2, 85% into Year 3, 79% into Year 4, 74% into Year 5, 68% into Year 6, 62% into Year 7 and 54% into Year 8. Notably, the 2012 cohort of beginning teachers is markedly smaller than other cohorts. This is most likely an effect of the 2011 budget cuts to Texas public school education funds and perhaps lingering effects of the Great Recession on school district budgets. Still, despite the smaller size, the percentage of teachers who remained in classrooms over time was very consistent across cohorts. In fact, the five-year retention patterns of the 2013 through 2015 cohorts demonstrated consistent retention patterns of 76%.

Finding 2: Black and Hispanic teachers have higher retention rates relative to their peers of other races and ethnicities. Examining retention among different teacher races and ethnicities, Black and Hispanic teachers demonstrate higher retention rates than other teachers. Table 7 illuminates retention differences among teacher races and ethnicities by showing the number of EPP participants who taught for the first time between 2012 and 2018, the number of those teachers still teaching in 2019 and the calculated retention rates for each race/ethnicity. For example, the chart shows that there were 36,935 first-year Hispanic teachers between 2012 and 2018. Of those, 29,547, or 80%, were still teaching in 2019.

TABLE 7

First-Year Teacher Cohorts in 2012-2018 Still Teaching in 2019, Retention Rates by Race/Ethnicity

Race/Ethnicity	First-Year Teachers 2012-2018	First-Year Teachers 2012-2018 Still Teaching in 2019	Retention Rate
Hispanic	36,935	29,547	80%
Black	15,707	12,290	78%
Native American	402	306	76%
White	67,527	50,227	74%
Two or more races	1,989	1,411	71%
Asian	2,740	1,860	68%
Pacific Islander	68	43	63%
Total	**125,368**	**95,684**	**76%**

Finding 3: Teachers prepared through UBPs have higher retention rates than those prepared through ACPs. In order to understand the differences in retention between UBP and ACP program participants, Tables 8 and 9 display the retention rates of participants who began their teaching year (signaled by the teacher-of-record code in school district PEIMS records) between 2012 and 2018, differentiated by EPP type. These cohorts of teachers were followed through employment year 2019. Table 8 displays the number and retention rates of UBP participants who remained in a teaching role, and Table 9 displays the number and retention rates of ACP participants who remained in a teaching role. Where the dataset allowed for multiple cohort retention to be examined, both tables show retention rates were consistent among cohorts in both EPP types.

TABLE 8

UBP First-Year Teacher Retention, 2012-2019

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Cohort	#	%	%	%	%	%	%	%
2012	353	88%	82%	76%	71%	63%	63%	58%
2013	5,439	94%	90%	84%	81%	75%	68%	
2014	9,620	93%	89%	84%	79%	72%		
2015	9,965	93%	88%	84%	79%			
2016	9,319	93%	88%	83%				
2017	8,899	93%	87%					
2018	8,748	93%						
Average		92%	87%	82%	78%	70%	65%	58%

On average, Tables 8 and 9 show that UBPs have the same retention rate into Year 2 as ACPs (92%), but in each subsequent year, UBPs demonstrate a higher retention rate. The retention rate of UBP teachers into Year 3 is 87%, Year 4 is 82%, Year 5 is 78%, Year 6 is 70%, Year 7 is 65% and Year 8 is 58%.

TABLE 9

ACP First-Year Teacher Retention, 2012-2019

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Cohort	**#**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
2012	4,420	92%	81%	74%	68%	64%	60%	54%
2013	7,988	92%	84%	77%	72%	67%	61%	
2014	10,476	92%	84%	77%	73%	65%		
2015	11,849	92%	85%	79%	73%			
2016	11,855	92%	85%	78%				
2017	11,841	92%	84%					
2018	10,311	92%						
Average		**92%**	**84%**	**77%**	**72%**	**65%**	**60%**	**54%**

On average, Table 9 shows that 84% remain into the third year, 77% into the fourth, 72% into the fifth, 65% into the sixth, 60% into the seventh and 54% into the eighth year.

Research Question 5: Where do early-career teachers go when they leave the classroom?

Finding 1: Most EPP participants who leave the classroom either remain in the field of education or leave the workforce altogether. In order to understand what industries might be drawing teachers away from the classroom, an employment sector analysis was conducted. First, all individuals who began an EPP between 2012 and 2017 were identified, and their employment designation as of the fourth quarter of 2018 was established. Quarter 4 of 2018 was the most recent workforce data available for this analysis. Individuals who began EPPs between 2012 and 2017 were chosen because participants examined would have had time to earn a teaching certificate and be employed in the workforce using that certificate during 2018.

Table 10 displays the employment sectors of all EPP participants enrolled between 2012 and 2017 as of the fourth quarter of 2018. The overwhelming majority of EPP participants (79%) were employed in the education sector. Twelve percent had no Texas Workforce Commission record, signaling either movement outside of the state or no employment. Notably, less than 10% of individuals who began an EPP between 2012 and 2017 were not employed in the education sector in 2018. Of those employed outside of education, only three sectors employed significant numbers of EPP participants. Health care and social assistance; wholesale, retail and warehousing; and professional services each employed 2% of EPP participants. "Other" indicates the various other sectors employing EPP participants in very small numbers.

TABLE 10

2012-2017 EPP Participant Employment During Quarter 4 of 2018

Texas Workforce Commission Sector	Number	Percent
Education	91,275	79%
No Workforce Record	14,349	12%
Health Care and Social Assistance	1,772	2%
Wholesale, Retail and Warehousing	1,807	2%
Professional Services	2,495	2%
Other	4,506	4%
Total	116,204	

Table 11 disaggregates the EPP participant employment data by the highest level of certification received. The patterns among certification levels are similar: The large majority of EPP participants are employed in the field of education or have no workforce record.

TABLE 11

2012-2017 EPP Participant Employment During Quarter 4 of 2018 by Highest Level of Certification Received

	Uncertified		Paraprofessional		Probationary		Standard	
	#	%	#	%	#	%	#	%
Education	563	60%	736	61%	3,850	65%	86,126	80%
No Workforce Record	173	18%	182	15%	1,054	18%	12,940	12%
Other	157	17%	201	17%	595	10%	3,553	3%
Health Care and Social Assistance	25	3%	77	6%	137	2%	1,533	1%
Professional Services	14	2%	5	<1%	169	3%	2,307	2%
Wholesale, Retail and Warehousing	5	<1%	5	<1%	76	1%	1,721	2%
Total	**937**		**1,206**		**5,881**		**108,180**	

Among the small number (937) of EPP participants who never earned any type of educator certification, 60% are employed in education, 18% have no workforce record, 17% are employed in a wide variety of industries too numerous to list, 3% are in health care or social assistance, 2% are in professional services, and less than 1% are employed in wholesale, retail or warehousing. EPP participants who received a paraprofessional certificate (1,206) are similarly distributed among employment in education (61%), have no workforce record (15%), are employed in a wide variety of industries too numerous to list (17%), are employed in health care or social assistance (6%), or are employed in professional services (less than 1%) or wholesale, retail or warehousing (less than 1%). The EPP participants who received a probationary certificate but did not receive a standard certificate (5,881) were found to be employed in education (65%), have no workforce record (18%), be employed in a wide variety of industries too numerous to list (10%), be employed in health care or social assistance (2%) or be employed in professional services (3%) or wholesale, retail or warehousing (1%). While 80% of participants who received a standard teaching certificate (108,180) were employed in the field of education, 12% had no Texas workforce record at all. Standard teaching certification holders working outside of the field of education were found to be employed in professional services (2%), wholesale, retail or warehousing (2%), health care or social assistance (1%) or working among a wide array of other workforce designations (3%).

Finding 2: Wages earned by EPP participants who left the field of education were not higher than those employed in education. Extending the analysis from the previous finding, Texas Workforce Commission quarterly wages earned by individuals employed in and out of the field of education were compared. The mean salary for all EPP participants employed in each sector was calculated using wages in Quarter 4 of 2018. The top wage-earning industries of EPP participants, the number of EPP participants employed and their mean salaries are reported in Table 12.

TABLE 12

Top Wage-Earning Industries of EPP Participants, Quarter 4 2018

Industry	EPP Participants Employed Q4 2018	Mean Quarterly Wage
Education	90,564	$13,076
Utilities	20	$13,659
Manufacturing (Wood, Petroleum, Refineries)	44	$14,221
Mining	100	$15,053
Manufacturing (Metal, Machinery, Computers)	55	$16,996

Examining the salaries of the more than 90,000 EPP participants employed in the field of education, the average quarterly salary was $13,076. Only four categories of industries had higher mean salaries in 2018: utilities, $13,659; manufacturing (wood, petroleum, refineries), $14,221; mining, $15,053; and manufacturing (metal, machinery, computers), $16,996. However, it should be noted that all of the EPP participants employed in these four higher-wage-earning industries totaled only 219 individuals — less than 0.05% of the dataset. The average wages of all other industries were lower than that of the education industry.

Finding 3: Five years after their first year of teaching, 6% of teachers had left the classroom for a different position within the public education system. Because the Texas Workforce Commission data used for the employment sector analysis showed only the sector of employment, Texas Education Agency PEIMS data was used to understand how many EPP participants were still teaching after five years. Three cohorts of teachers in the dataset could be followed within the public education system for at least five years. When first-year teachers in 2012, 2013 and 2014 were followed through 2019, 67% of those teachers remained in the classroom, while 6% remained in the public school system but in a position other than classroom teacher. These other staff or faculty positions in the public school system include administration, counselors and campus- and district-level support staff. Table 13 demonstrates the number of first-year teachers in 2012, 2013 and 2014 for each EPP type and the number and percentage who were still teaching in 2019, along with those who had taken another school system position in 2019.

TABLE 13

Teacher Retention and Other School Positions at Least Five Years After First Teaching Year, 2019

	ACP		UBP		Total	
	#	%	#	%	#	%
First-Year Teachers in 2012, 2013, 2014	22,884		15,412		38,296	
Still Teaching in 2019	14,575	64%	11,124	72%	25,699	67%
Other School Positions in 2019	1,446	6%	755	5%	2,201	6%

A higher percentage (72%) of 2012, 2013 and 2014 first-year UBP-prepared teachers remained in the classroom through 2019, and a larger proportion of 2012, 2013 and 2014 first-year ACP-prepared teachers left the classroom for another position within the school system.

Discussion

The ever-growing population of students attending Texas public schools each year — now at more than 5 million — requires a constant supply of high-quality teachers. In order to meet demand, Texas policymakers have provided a wide variety of options for teacher certification through UBPs and ACPs, which offer opportunities for prospective educators to enter the profession at several points throughout their collegiate or professional career. Aimed at improving these policy efforts, the purpose of this study was to provide an exploration of the Texas EPP landscape to inform future research and policy decisions regarding EPP evaluation.

Teacher Production

Particularly over the past few years, the landscape of teacher education has markedly changed. For three decades, EPP enrollment generally increased annually to reach a maximum of nearly 25,000 prospective teachers enrolled in 2008. However, in 2009, EPP enrollment began to decline despite a steadily increasing student population in Texas schools. EPP participation has not recovered to prerecession participation and dropped to a 20-year low of 12,263 prospective teachers in 2018 (see Figure 1). A reduction in enrollment is not the only notable change. In 2014, ACPs surpassed UBPs in enrollment and continue to enroll a larger share of the state's future teachers (see Figure 2). Not only are ACPs the most-used type of EPP, but the population enrolled differs from the population enrolled in UBPs.

Despite ACPs enrolling more minority and male participants than UBPs, the gender and racial characteristics of EPP participants in Texas have yet to reflect those of the student population.

Though individuals enrolled in Texas EPPs are largely female (74%) and white (54%), ACPs enroll twice as many male and three times as many Black individuals (see Figures 3 and 5). Still, despite ACPs enrolling more minority and male participants than UBPs, the gender and racial characteristics of EPP participants in Texas have yet to reflect those of the student population (see Figure 4). Well-established in the literature is the importance of student racial and ethnic representation in the teaching workforce (Egalite, Kisida & Winters, 2015; Grissom, Kern & Rodriguez, 2015; Ladson-Billings, 2005; Villegas & Irvine, 2010). EPPs serve a critical role in the diversification of the teaching workforce through recruitment, preparation and support of teachers of color (Reiter & Davis, 2011; Villegas & Davis, 2007).

Looking beyond the composition of participants enrolled in Texas EPPs, this study also examined the production of certified teachers. Both ACPs and UBPs proved efficient producers of certified teachers, as overwhelming percentages (90-95%) of participants enrolled in an EPP completed the program and received a standard teaching certificate. However, the types of certificates produced by ACPs and UBPs were quite different. The divide among subject area certifications follow what is known about ACPs preparing more middle and high school teachers and UBPs preparing more elementary school teachers (see Figure 7). For example, in the sample, the highest proportion of teachers with generalist and ESL certificates (certifications common in elementary schools) were certified through UBPs, and the highest proportion of teachers with science, Spanish and social studies certificates (common in middle and high schools) were certified through ACPs. ACPs lead in the certificate production of high-need areas such as special education and science but are tied with university production of mathematics certificates (see Table 3).

Just as ACPs and UBPs exhibited variance in the types of certifications received by participants, campuses hiring first-year ACP-prepared teachers differed from those hiring first-year UBP-prepared teachers. More than twice the number of first-year charter school teachers were prepared by ACPs (see Table 4), and ACP-prepared first-year teachers were hired at campuses with higher percentages of economically disadvantaged students than UBP-prepared first-year teachers (67% versus 63%). ACP-prepared first-year teachers were also hired by campuses serving student populations with larger proportions of Hispanic and Black students and smaller populations of white and Asian students (see Figure 6).

Teacher Retention

Examining the data on teacher retention in Texas is of utmost importance. A large body of research has stressed the detrimental effects of high teacher turnover rates on public education (Borman & Dowling, 2006; Ronfeldt, Loeb & Wyckoff, 2013). Teacher turnover can adversely affect the quality of teaching that students receive as experienced teachers move to better schools, leaving lower-performing students with replacement teachers who, more often than not, lack the necessary experience or skills to help them succeed (Martinez-Garcia & Slate, 2009). Teacher turnover can also disrupt cohesiveness and effectiveness within a school community, which in turn negatively impacts student learning (Bryk, Lee & Smith, 1990; Ingersoll, 2001). In addition, high financial expenditures are associated with the recruitment, hiring and mentoring of new teachers as a result of low retention rates (Feng & Sass, 2017; Ingersoll, 2001).

Previous analyses of teacher retention found that, nationally, roughly 50% of teachers remain in teaching after five years (Darling-Hammond, 2003; Ingersoll & Smith, 2003). As a unique contribution to the literature base and an important consideration for EPP evaluation, this study examined the retention of new teachers in Texas. After five years, 74% of Texas teachers in this sample remained in the classroom (see Table 6), much higher than the previously reported national average of 50%. Though retention rates were consistent over time, this study found variance among race and ethnic groups and between EPP types. Previous studies of teacher mobility in Texas examining the entire teaching population found Hispanic teachers to have higher retention rates but demonstrated Black teachers to have lower retention rates (Sullivan, Barkowski, Lindsay, Lazarev, Nguyen, Newman & Lin, 2017). In this study of beginning teachers, Hispanic and Black teachers demonstrated the highest retention rates of 80% and 78%, respectively (see Table 7), which illuminates an interesting trend of retention in new Black teachers in the state.

Teacher turnover can adversely affect the quality of teaching that students receive as experienced teachers move to better schools, leaving lower-performing students with teachers who, more often than not, lack the experience or skills to help them succeed.

Teacher preparation pathways also influenced retention. Retention rates among teachers prepared through ACPs and UBPs were the same into Year 2 (92% of teachers remained), but retention rates of UBP-prepared teachers were consistently at least 5 percentage points higher than ACP-prepared teachers into Years 4 through 7 (see Tables 8 and 9). Digging deeper into the attrition of ACP teachers, this study found that most ACP teachers who leave the classroom serve a different position in the public education system. ACP teachers more often left the classroom for another school position than UBP teachers (6% to 5%; see Table 13). The requirement that ACP participants have a bachelor's degree prior to enrolling in the program increases the likelihood that ACP participants had more workforce experience than UBP participants. Coupled with the smaller amounts of classroom preparation provided by ACPs, participants of these programs are perhaps more likely to be promoted into middle management or serve a role in the school more suited to their baccalaureate area of training or experience than UBP participants who were more extensively trained for success in the classroom (Ingersoll, Merrill & May, 2012).

Of those who left the classroom, many remained in the field of education or left the workforce altogether, findings consistent with earlier research (Chingos & West, 2012). Of the small proportion (9%) of EPP participants employed outside of education, salary was not likely an influencing factor, as average salaries of those who left education were less than those employed in education. This examination of early-career teachers presents an opportunity to further examine the importance of earnings potential outside of education and its influence on teacher pay scale development as considered in earlier publications (Britton & Propper, 2016; Chingos & West, 2012).

Conclusion

The large and diverse field of educator preparation in Texas is necessary to serve an equally large and diverse population of public school students. The purpose of this study was to provide information to aid Texas policymakers and practitioners on their quest to provide a steady supply of high-quality public school teachers for the state and to inform future research regarding the evaluation of EPPs. With access to individual, longitudinal data at UH ERC from the Texas Higher Education Coordinating Board, Texas Education Agency and Texas Workforce Commission, this study provided the first step in understanding the nuanced relationships among individual teachers, preparation pathways, schools and students that influence EPP evaluation. The Texas EPP landscape analysis demonstrated the important differences among teachers prepared by ACPs and UBPs.

This study provided the first step in understanding the nuanced relationships among individual teachers, preparation pathways, schools and students that influence EPP evaluation.

Implications for Future Research

Texas ACPs have become the primary producers of classroom teachers. ACP-prepared teachers in Texas are from more diverse racial and ethnic backgrounds than UBP-prepared teachers and more often teach in middle and high schools with larger populations of economically disadvantaged and minority students. The higher classroom retention rates of minority teachers provide an opportunity to share a narrative in contrast to existing literature and to improve teacher retention rates by increasing the number of minority teachers. Also, the mobility of early-career teachers — especially ACP-prepared teachers — into other positions within the public school system requires a deeper look inside the career pathways available to teachers. Consideration of these important differences in future research, alongside consideration of contemporary literature regarding measurement of student outcomes (Bitler et al., 2019) and insights into the effects of school climate on outcomes (Kraft, Marinell & Yee, 2016), will yield important improvements in the field of EPP evaluation. Finally, empirical investigation into the most appropriate and suitable means of evaluating teacher quality remains necessary.

Implications for EPP Policy and Practice

The findings of this study suggest several areas of attention for Texas EPP policymakers and practitioners. First, consideration should be made for incentivizing improvement in order to reverse trends of declining EPP enrollment, especially in the university-based programs. The steady growth of the Texas public school student population demands a constant supply of high-quality teachers. In incentivizing improvement, special provisions should be made for increasing enrollment of participants from racially and ethnically diverse backgrounds, and incentives should be based on demand for particular certification areas of high need. Further, student success should take the lead in guiding decision-making, but the ambiguously demonstrated effects of quality of teaching on student success are not a reliable data source upon which to make high-stakes decisions. Finally, the effects of the public school system's own siphoning of teachers from the classroom into other positions within the system should be considered for teacher preparation pathways and measures of EPP success. With these considerations, Texas EPPs will be more likely to meet the increasing demand of the Texas public school system to prepare Texas students for academic and economic success.

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Appendix A: Certification Route Code Categorizations

Alternative Certification Program

4 alternative certification
17 alternative initial (10/93 and later)
18 alternative additional (10/93 and later)
22 alternative initial post bacc with degree from other institution
23 alternative additional post bacc with degree from other institution
26 post bacc w/content prep ACP
29 post bacc w/o content prep ACP
37 acp w/prep
38 acp w/o prep

University-Based Program

1 university based initial
8 additional college/university deficiency plan
10 university based additional
11 post bacc;>=9293: PB-PD test or degree unknown
15 post bacc degree from other institution
16 post bacc degree from this institution
20 university based initial post bacc w/degree from other institution
21 university based additional post bacc w/degree from other institution
24 post bacc w/content prep UBI
25 post bacc w/content prep UBA
27 post bacc w/o content prep UBI
28 post bacc w/o content prep UBA
31 university initial w/prep
32 university initial w/o prep
33 university post bacc w/prep
34 university post bacc w/o prep
35 university acp w/prep
36 university acp w/o prep

Other

2 additional certification
3 out of state
5 charter school teacher
6 temporary teacher certificate
7 certification by exam only
9 additional professional
12 not seeking teacher certification
30 master teacher program
39 out of state/out of country
40 charter school
41 temporary teacher certificate
42 certification by exam
43 pre-admission content test
44 SOQ verified certification by exam
99 **, modify

Appendix B: Texas Educator Preparation Programs, 1986-2019

Organization names are reported as recorded in the archived State Board for Educator Certification data and may not reflect current institution names.

EPP Type	Organization Name
ACP	A CAREER IN EDUCATION-ACP
ACP	A CAREER IN TEACHING-EPP (HUMBLE)
ACP	A CAREER IN TEACHING-EPP (MCALLEN)
ACP	A CAREER IN TEACHING-EPP (CORPUS CHRISTI)
ACP	A+ TEXAS TEACHERS
ACP	A+ TEXAS TEACHERS (BEDFORD/FORT WORTH)
UBP	ABILENE CHRISTIAN UNIVERSITY
ACP	ACT-CENTRAL TEXAS - TEMPLE
ACP	ACT-HOUSTON
ACP	ACT-HOUSTON AT AUSTIN
ACP	ACT-HOUSTON AT DALLAS
ACP	ACT-RIO GRANDE VALLEY
ACP	ACT-SAN ANTONIO
ACP	ALAMO COLLEGES
ACP	ALAMO COMMUNITY COLLEGE DISTRICT
ACP	ALTERNATIVE CERTIFICATION FOR TEACHERS NOW! (EL PASO)
ACP	ALTERNATIVE-SOUTH TEXAS EDUCATOR PROGRAM -LAREDO (A-STEP)
ACP	ALTERNATIVE-SOUTH TEXAS EDUCATOR PROGRAM
UBP	ANGELO STATE UNIVERSITY
UBP	ARLINGTON BAPTIST COLLEGE
ACP	ATC-EAST HOUSTON
UBP	AUSTIN COLLEGE
ACP	AUSTIN COMMUNITY COLLEGE
UBP	BAYLOR UNIVERSITY
ACP	BLINN COLLEGE
ACP	COLLEGE OF THE MAINLAND COMPACT
ACP	COLLIN COUNTY COMMUNITY COLLEGE
UBP	CONCORDIA UNIVERSITY
UBP	DALLAS BAPTIST UNIVERSITY
ACP	DALLAS CHRISTIAN COLLEGE
ACP	DALLAS ISD
UBP	EAST TEXAS BAPTIST UNIVERSITY
ACP	EDUCATION CAREER ALTERNATIVES PROGRAM
ACP	EDUCATORS OF EXCELLENCE ACP
ACP	EIT: EXCELLENCE IN TEACHING
ACP	ETEACH N TEXAS
UBP	HARDIN-SIMMONS UNIVERSITY
ACP	HARRIS COUNTY DEPT OF ED
UBP	HOUSTON BAPTIST UNIVERSITY
ACP	HOUSTON COMMUNITY COLLEGE SYSTEM
ACP	HOUSTON ISD
UBP	HOWARD PAYNE UNIVERSITY
UBP	HUSTON-TILLOTSON UNIVERSITY
ACP	INTERN TEACHER ACP

EPP Type	Organization Name
ACP	ITEACHTEXAS
UBP	JARVIS CHRISTIAN COLLEGE
ACP	LAMAR STATE COLLEGE - ORANGE
UBP	LAMAR UNIVERSITY
ACP	LAREDO COMMUNITY COLLEGE
UBP	LETOURNEAU UNIVERSITY
ACP	LONE STAR COLLEGE - CY-FAIR
ACP	LONE STAR COLLEGE - KINGWOOD
ACP	LONE STAR COLLEGE - MONTGOMERY
ACP	LONE STAR COLLEGE - NORTH HARRIS
ACP	LONE STAR COLLEGE - TOMBALL
UBP	LUBBOCK CHRISTIAN UNIVERSITY
ACP	MCLENNAN COMMUNITY COLLEGE
UBP	MCMURRY UNIVERSITY
UBP	MIDWESTERN STATE UNIVERSITY
ACP	MOUNTAIN VIEW COLLEGE
ACP	NORTH AMERICAN COLLEGE
UBP	OUR LADY OF THE LAKE UNIVERSITY
ACP	PASADENA ISD
UBP	PAUL QUINN COLLEGE
ACP	PFLUGERVILLE ISD
UBP	PRAIRIE VIEW A&M UNIVERSITY
ACP	QUALITY ACT: ALTERNATIVE CERTIFIED TEACHERS
ACP	REG I EDUCATION SERVICE CENTER
ACP	REG II EDUCATION SERVICE CENTER
ACP	REG III EDUCATION SERVICE CENTER
ACP	REG IV EDUCATION SERVICE CENTER
ACP	REG V EDUCATION SERVICE CENTER
ACP	REG VI EDUCATION SERVICE CENTER
ACP	REG VII EDUCATION SERVICE CENTER
ACP	REG X EDUCATION SERVICE CENTER
ACP	REG XI EDUCATION SERVICE CENTER
ACP	REG XII EDUCATION SERVICE CENTER
ACP	REG XIII EDUCATION SERVICE CENTER
ACP	REG XIV EDUCATION SERVICE CENTER
ACP	REG XIX EDUCATION SERVICE CENTER
ACP	REG XVIII EDUCATION SERVICE CENTER
ACP	REG XX EDUCATION SERVICE CENTER
UBP	RELAY GRADUATE SCHOOL OF EDUCATION
UBP	RICE UNIVERSITY
UBP	SAM HOUSTON STATE UNIVERSITY
ACP	SAN ANTONIO COLLEGE CENTER FOR EDUCATOR PREPARATION
ACP	SAN JACINTO COLLEGE NORTH
UBP	SCHREINER UNIVERSITY
ACP	SOUTH TEXAS COLLEGE
ACP	SOUTH TEXAS TRANSITION TO TEACHING ACP
UBP	SOUTHERN METHODIST UNIVERSITY
ACP	SOUTHWESTERN ADVENTIST UNIVERSITY
UBP	SOUTHWESTERN ASSEMBLIES OF GOD UNIVERSITY
UBP	SOUTHWESTERN UNIVERSITY
UBP	ST EDWARD'S UNIVERSITY
UBP	ST MARY'S UNIVERSITY
UBP	STEPHEN F AUSTIN STATE UNIVERSITY

EPP Type	Organization Name
ACP	STEPS TO TEACHING - ACP
UBP	SUL ROSS STATE UNIVERSITY - ALPINE
UBP	SUL ROSS STATE UNIVERSITY - RIO GRANDE
UBP	TARLETON STATE UNIVERSITY
ACP	TEACHERBUILDER.COM
ACP	TEACHERS FOR THE 21ST CENTURY
UBP	TEXAS A&M INTERNATIONAL UNIVERSITY
UBP	TEXAS A&M UNIVERSITY
UBP	TEXAS A&M UNIVERSITY - CENTRAL TEXAS
UBP	TEXAS A&M UNIVERSITY - COMMERCE
UBP	TEXAS A&M UNIVERSITY - CORPUS CHRISTI
UBP	TEXAS A&M UNIVERSITY - KINGSVILLE
UBP	TEXAS A&M UNIVERSITY - SAN ANTONIO
UBP	TEXAS A&M UNIVERSITY - TEXARKANA
ACP	TEXAS ALTERNATIVE CENTER FOR TEACHERS
ACP	TEXAS ALTERNATIVE CERTIFICATION PROGRAM @ AUSTIN
ACP	TEXAS ALTERNATIVE CERTIFICATION PROGRAM @ BROWNSVILLE
ACP	TEXAS ALTERNATIVE CERTIFICATION PROGRAM @ HOUSTON
ACP	TEXAS ALTERNATIVE CERTIFICATION PROGRAM @ SAN ANTONIO
ACP	TEXAS ALTERNATIVE CERTIFICATION PROGRAM
UBP	TEXAS CHRISTIAN UNIVERSITY
UBP	TEXAS COLLEGE
ACP	TEXAS GULF FOUNDATION
UBP	TEXAS LUTHERAN UNIVERSITY
UBP	TEXAS SOUTHERN UNIVERSITY
UBP	TEXAS STATE UNIVERSITY
ACP	TEXAS TEACHING FELLOWS (AUSTIN)
ACP	TEXAS TEACHING FELLOWS (DALLAS)
ACP	TEXAS TEACHING FELLOWS (SAN ANTONIO)
UBP	TEXAS TECH UNIVERSITY
UBP	TEXAS WESLEYAN UNIVERSITY
UBP	TEXAS WOMAN'S UNIVERSITY
ACP	THE TEXAS INSTITUTE FOR TEACHER EDUCATION
ACP	TNTP ACADEMY - FORT WORTH
ACP	TRAINING VIA E-LEARNING: AN ALTERNATIVE CERTIFICATION HYBRID
UBP	TRINITY UNIVERSITY
ACP	TYLER JUNIOR COLLEGE
UBP	UNIVERSITY OF DALLAS
UBP	UNIVERSITY OF HOUSTON
UBP	UNIVERSITY OF HOUSTON-CLEAR LAKE
UBP	UNIVERSITY OF HOUSTON-DOWNTOWN
UBP	UNIVERSITY OF HOUSTON-VICTORIA
UBP	UNIVERSITY OF MARY HARDIN-BAYLOR
UBP	UNIVERSITY OF NORTH TEXAS
UBP	UNIVERSITY OF NORTH TEXAS - DALLAS
UBP	UNIVERSITY OF PHOENIX - SAN ANTONIO
UBP	UNIVERSITY OF ST THOMAS
UBP	UNIVERSITY OF TEXAS - ARLINGTON
UBP	UNIVERSITY OF TEXAS - AUSTIN
UBP	UNIVERSITY OF TEXAS - BROWNSVILLE
UBP	UNIVERSITY OF TEXAS - DALLAS
UBP	UNIVERSITY OF TEXAS - EL PASO
UBP	UNIVERSITY OF TEXAS - PAN AMERICAN

EPP Type	Organization Name
UBP	UNIVERSITY OF TEXAS - PERMIAN BASIN
UBP	UNIVERSITY OF TEXAS - SAN ANTONIO
UBP	UNIVERSITY OF TEXAS - TYLER
UBP	UNIVERSITY OF THE INCARNATE WORD
UBP	WAYLAND BAPTIST UNIVERSITY
ACP	WEATHERFORD COLLEGE
ACP	WEB-CENTRIC ALTERNATIVE CERTIFICATION PROGRAM
UBP	WEST TEXAS A&M UNIVERSITY
UBP	WESTERN GOVERNORS UNIVERSITY
UBP	WILEY COLLEGE
ACP	YES PREP PUBLIC SCHOOLS INC

Appendix C:
EPP Participant Characteristics Over Time, 2012- 2018

TABLE 1A

EPP Participants by Program Type, 2012-2018

Cohort	ACP	UBP	Total
2012	6,224	10,115	16,339
2013	8,155	10,782	18,937
2014	10,085	9,938	20,023
2015	11,529	9,345	20,874
2016	12,103	8,347	20,450
2017	12,902	6,679	19,581
2018	10,885	1,378	12,263
Total	**71,883**	**56,584**	**128,467**

TABLE 2A

Gender and ACPs

Cohort	Female	Male	Total
2012	4,138	2,067	6,205
2013	5,525	2,612	8,137
2014	6,980	3,098	10,078
2015	7,877	3,642	11,519
2016	8,398	3,700	12,098
2017	8,931	3,960	12,891
2018	7,441	3,325	10,766
Total	**49,290**	**22,404**	**71,694**

TABLE 2B

Gender and UBPs

Cohort	Female	Male	Total
2012	8,360	1,734	10,094
2013	8,854	1,908	10,762
2014	8,087	1,845	9,932
2015	7,576	1,761	9,337
2016	6,839	1,506	8,345
2017	5,410	1,247	6,657
2018	1,057	289	1,346
Total	**46,183**	**10,290**	**56,473**

Appendix D:
EPP Participant Pedagogy Test Score Distribution

FIGURE 1A

Distribution of Pedagogy Test Scores, 2012-2018

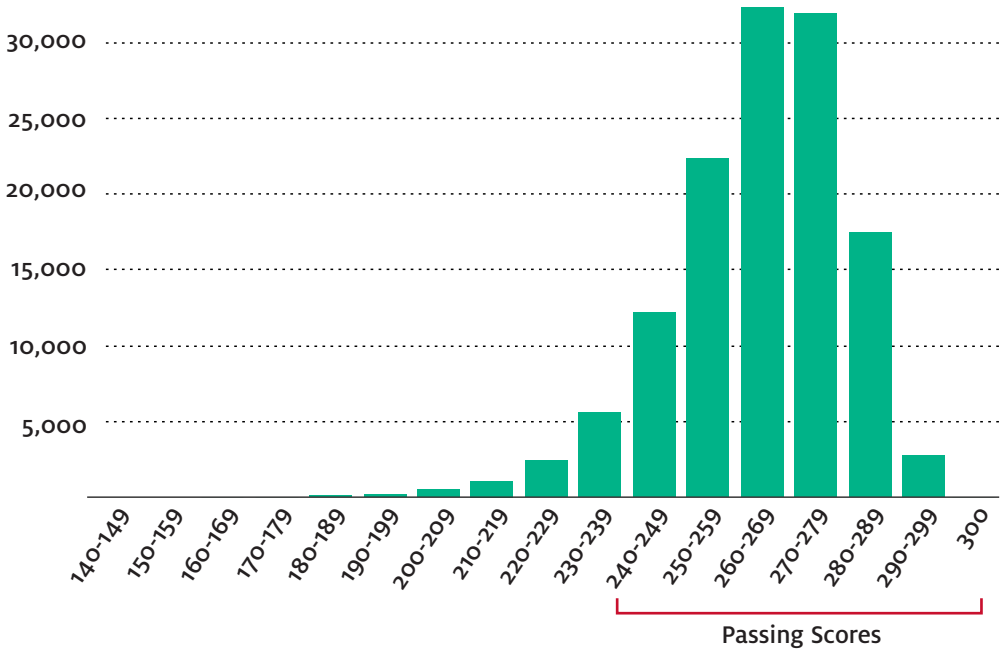

FIGURE 2A

Distribution of Natural Log Skewness Corrected Pedagogy Test Scores, 2012-2018