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POLICY BRIEF

TEXAS EDUCATOR PREPARATION PATHWAYS STUDY

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Executive Summary

Little is known about differences between traditional, university-based certification programs and alternative certification programs in terms of outcomes for students and teachers. Across all preparation pathways, however, too many early career teachers leave the field (over 40% within first five years). This attrition problem is likely to grow in the next few years with the impact of the COVID-19 pandemic and other factors. Historically, one response to the growing teacher shortage in Texas has been the development of many different pathways into the profession for those wishing to enter PreK-12 classrooms— more teachers certified through alternative pathways than any other state by a considerable margin.

This report provides a summary of findings from the educator preparation pathways study. The study includes two sets of analyses—one focused on student outcomes and one focused on teacher outcomes. This report is an important first step toward addressing the knowledge gaps in what we know as we work to build a deeper evidence base for improving teacher retention and effectiveness.

Student Performance and Teacher Effectiveness. Texas has gathered a significant amount of data about students and teachers, including the results of every state test every student has taken since 2012, linked to their teacher. We analyzed changes in students' test scores over time to find which types of teachers led students to learn the most. We considered school poverty concentration and other factors that influence the challenge of teaching.

Teacher Retention & Mobility. Teacher experience matters and teachers who stay in teaching develop a deep understanding of how they can help students succeed. As a result, teacher retention is an important factor to being successful with all students. We looked at how long teachers stay in the field of education, where they teach, and their mobility across varying school contexts.

Summary: Although variations exist within the group, university-based pathways typically include multiple field experiences culminating in a semester of student teaching prior to becoming teacher of record. Research has demonstrated the importance of such clinical practice and preparation, and the inclusion of this additional (supported/supervised) time in the field is likely contributing to better outcomes for university-prepared teachers (Sutcher et al., 2016; Zhang & Zeller, 2016). It is important to note that, since most alternative certification bypasses student teaching, teacher candidates from these programs often face great challenges in their first year that may lead to reduced retention in the field and decreased teaching effectiveness. Overall, the findings indicate that university-certified teachers had higher student learning and stayed longer in the field than alternatively certified teachers.

What We Studied

Texas is like no other state in its preparation of teachers. On average, Texas prepares about 26,000 teachers annually, yet the growth rate of Texas' PK-12 population— which is among the highest in the country—add increased demand for

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more teachers. In response to the ongoing teacher shortages, Texas is unique in terms of the many different pathways created to train teachers wishing to enter PK-12 classrooms. These programs include university-based certification programs, as well as alternative certification programs. University-based programs consist of multiple semesters of coursework and practice-based field experiences. Alternative certification programs offer an accelerated entry into the classroom as coursework and internship experiences are completed while serving as the teacher of record.

Currently, Texas produces far more alternatively certified teachers than any other state. Specifically, Texas produces 60% of the nation's alternatively certified teachers through non-university alternative certification pathways. More than half of all new teachers hired in Texas come from alternative preparation programs, which has allowed an increase in the number of teachers entering the profession at a time when teacher shortages persist across the state. Given these trends and differences in preparation experiences, this study was designed to examine both student performance and teacher retention and mobility outcomes of the different pathways available to people who become certified as teachers.

Purpose of the Study and Research Questions

This report is an important first step toward addressing the knowledge gaps in what we know as we work to build a deeper evidence base for improving teacher retention and effectiveness. The study includes two sets of analyses—one focused on student outcomes and one focused on teacher outcomes. This study addresses the following research questions:

1. How do value-added estimates for changes in student test scores depend upon teacher preparation pathway?
2. How do value-added estimates vary by school type (urban, rural, suburban, and charter), student, classroom, and campus demographics, including gender, race, ethnicity, and free lunch status?
3. What are the most informative groupings of teacher preparation pathway; for example, do student outcomes differ between for-profit and non-profit alternative providers?

4. What individual, teacher preparation, school-level, and district-level factors influence teacher retention/mobility/attrition, both school-specific retention and retention in the teaching profession overall?
5. How does variation in teacher retention/mobility/attrition rates differ by campus-level characteristics (e.g., school leader characteristics, avg. teacher-colleagues characteristics, avg. school leader and teacher salary…)?
6. How does teacher retention/mobility/attrition vary by educator preparation pathways (traditional vs. alternative certification)?

How We Analyzed the Data

Student Performance and Teacher Effectiveness: We used value-added models to compare university and alternatively certified teachers to examine student learning outcomes. The sample size was between 6,000 and 30,000 teachers per grade level and subject area over the period from 2012 to 2019. We focused on the ways policies related to teacher preparation impact student achievement. These models are hierarchical linear models, and we employed lmer in R. For subjects where a given student was tested in two consecutive years, we modeled the student score in the second year as a cubic polynomial in the student's score the preceding year. The models included campus, teacher, and class as random effects, and a range of demographic variables as fixed effects. These included both individual student demographics and classroom averages of demographic variables. To examine the effect of teacher preparation pathways, we included flags for teacher preparation programs of different types.

We also conducted a longitudinal analysis, where we identified students in third grade and grouped them according to their math or English scores. They were in the first score group if they scored between 90% and 100%, the second score group if they were between 80% and 90% and so on. We also grouped them depending on whether they were eligible for free or reduced lunch or not. Thus, for math each third-grade student was in one of 20 groups and for English each third-grade student was in one of 20 groups. Then we followed all the students in each of the groups forward, finding their average math and English scores in each group each year. This enabled us to estimate the effect of poverty on student test performance over time, for students whose performance in third grade was the same.

Teacher Retention: We followed a cohort of over 14,000 certified teachers from IHE-based university certification pathways (49%) and alternative certification pathways (51%) from 2010 to 2019. The analytic strategies used for teacher

retention, attrition, and mobility study began with using propensity score weighting to create equivalent comparison groups of university and alternatively certified teachers. First, we looked at teacher employment using a linear probability model. This was to examine the effect of the mode of entry on employment, and we created dichotomous variables indicating whether a teacher was employed as a teacher in the school years 2010 to 2019.

Secondly, we examined retention with the survival analysis technique. In survival analysis the outcome variable of interest is time until an event occurs. In this case the event is teacher attrition (not surviving) and survival is retention. Survival analysis estimates the probability of a teacher "surviving" or being retained in the nine years we observed in our data. Additionally, hazard ratios, which are an estimate of the ratio of the hazard rate in the one group versus the other group, was used to capture a case's instantaneous chance of "failure" or attrition to identify the most powerful predictors of teacher retention. Finally, multinomial logistic regression (MNLR) was used to examine teacher mobility. MNLR was used to evaluate the impact of teacher preparation pathway upon the different mobility pathways (moved to an advanced professional position, changed campus, changed district, or left education).

What We Discovered

Student Performance and Teacher Effectiveness Measures:
Student Learning Measure. In this study, student learning was investigated by looking at changes in student test scores on the State of Texas Assessments of Academic Readiness (STAAR) exam over time. The analysis used value-added models to determine how much students learn during a given school year based on their scores.
Student learning differed based on where their teachers were certified.
Months of Learning Definition. This is a measure of how much students learned during a given school year based on their scores on the STAAR exam. Students whose scores go up by more than expected are said to gain additional months of learning.

Key Findings of Student Performance and Teacher Effectiveness:

- In every tested subject, students do better if their teachers had university-certified teachers.
- Every year, from fourth through eighth grade, students gain the equivalent of one to two extra months of school time spent on mathematics if their teachers came from university-based programs.
- For low-income students, having a teacher from a university program offsets up to half the disadvantages that come from living in poverty.

Key Findings of Teacher Retention:

- University-certified teachers were retained at a 73% rate during a nine-year period, while only 59% of alternatively certified teachers remained in the field.
- Black and Hispanic/Latino/a teachers are more likely to advance professionally in both university and alternative pathways. A higher proportion of Black (9%) and Hispanic (6%) teachers obtained advanced roles compared to White teachers (4%).

Results

In summary, university-certified teachers had higher student learning and stayed longer in the field than alternatively certified teachers. However, university-based programs take longer to complete, particularly for people returning for a second career, are typically more expensive than programs from other providers, and some may draw a less diverse population. Universities are producing fewer teachers than are necessary to fill the teaching needs for the state of Texas. Universities need to make their own certification pathways more accessible and more affordable to better serve the state of Texas.

Alternative certification pathways provide more flexible pathways into teaching. Alternative certification programs have grown over the last 15-20 years and have helped address the teacher shortage, and, importantly, have contributed to needed efforts to diversify the pipeline of teacher candidates.

Key Findings of Student Performance and Teacher Effectiveness:

For every grade level, and in every subject, students learned more from university-certified teachers than alternatively certified teachers. Figures 1 and 2 look at student learning gains in mathematics and English language arts in elementary and middle school, and 9th grade. Every year, from 4th to 9th grade, students gain the equivalent of one to two extra months of learning in mathematics if they had university-certified teachers. Every year, from 4th to 9th grade, students gain up to an extra month learning in reading and writing if they had university-certified teachers. To put the value-added models and months of learning into context, imagine a student staying home for an entire month of school. Catching them up after just that one month would require not only the normal amount of learning growth, but a substantial additional effort to accelerate their learning to where they would have been if they had not stayed home. A difference of one or two months of learning per year may not seem very large, but differences build up over time.

Figure 3 looks at differences in months of student learning based on whether they were eligible for free and reduced lunch[1], the customary way to identify students from low-income backgrounds, and whether their teachers were from university or an alternative certification program. We found that for low-income students, having a university-certified teacher can offset half or more of the disadvantages that comes from living in poverty.

Figure 1: Additional months of learning in mathematics per year when student had a university-certified teacher

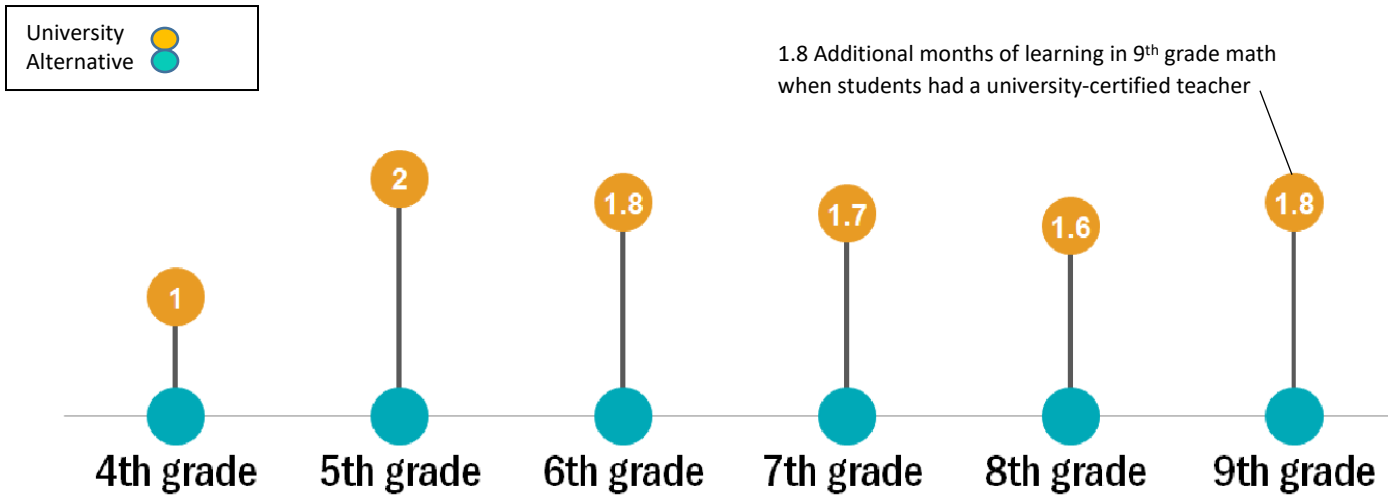
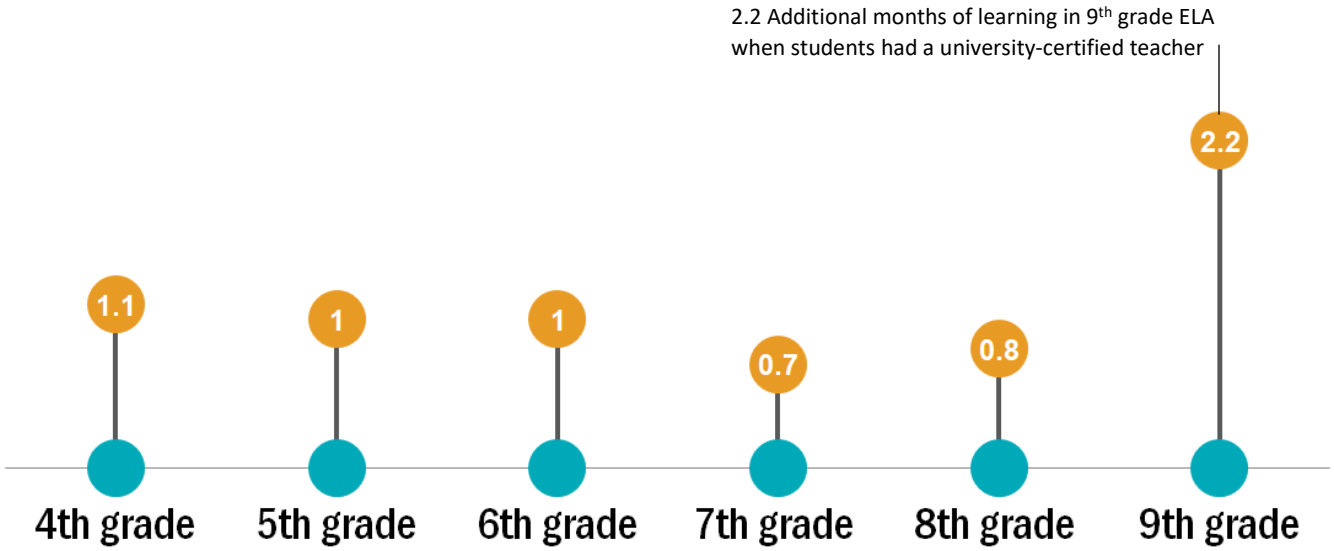
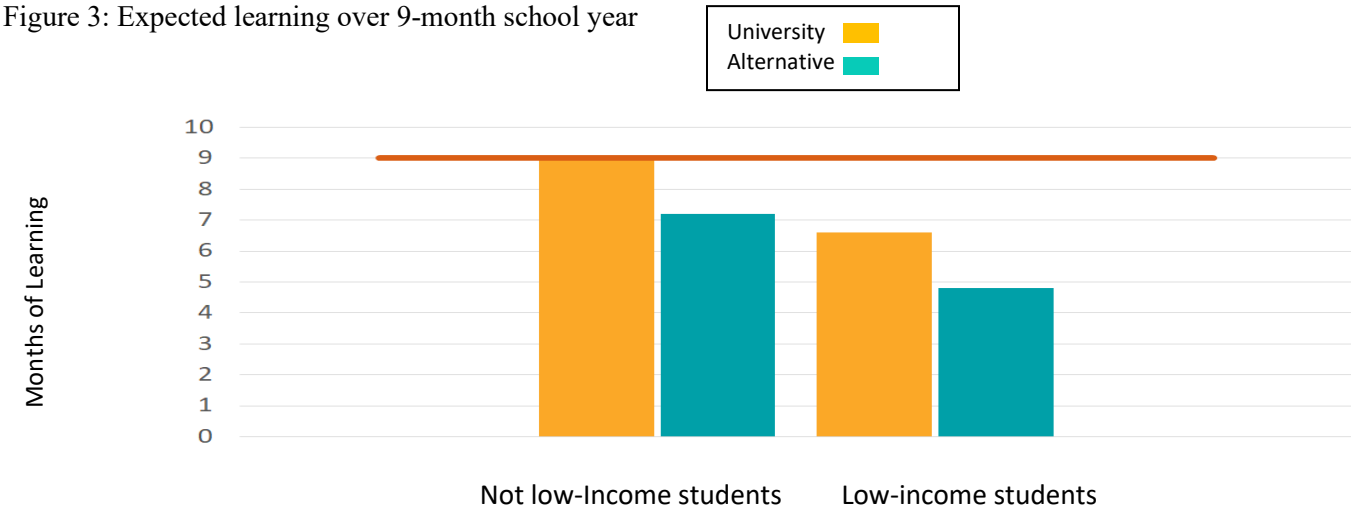


Figure 2: Additional months of learning in English language arts per year when student had a university-certified teacher



[1] Low-income students were those eligible for free or reduced-price lunch (FRPL). Not-low-income were not eligible for FRPL

Figure 3: Expected learning over 9-month school year



Key Findings of Teacher Retention:

The sample of teachers (n = 14, 825) studied included educators who were certified from university-based and alternative certification programs during September 2009 to August 2010 and were followed for nine years. When we analyzed teacher employment from 2010 to 2019, we found that an average of about 30,000 teachers left teaching per year, leading to about 45% of teachers across both pathways who either left the education system completely or moved within the field to pursue different roles in education. Figure 4 shows that by 2019, 73% of certified teachers from university certification pathways were still teaching or had roles in the education system compared to 59% of alternatively certified teachers. Over a nine-year period, university-certified teachers had a 24% higher retention rate than alternatively certified teachers. Alternatively certified teachers left teaching at a faster rate than university-certified teachers, with the biggest drop happening after their first year of teaching.

Figure 4: Rates of employment between university-certified teachers and alternatively certified teachers grew wider years

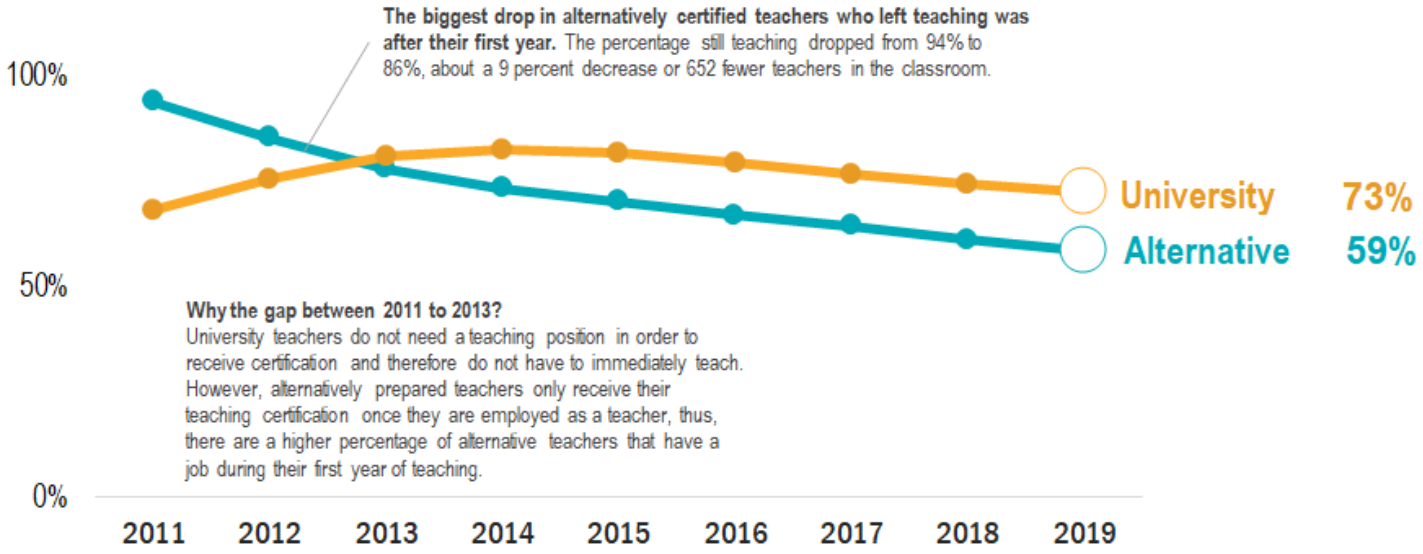
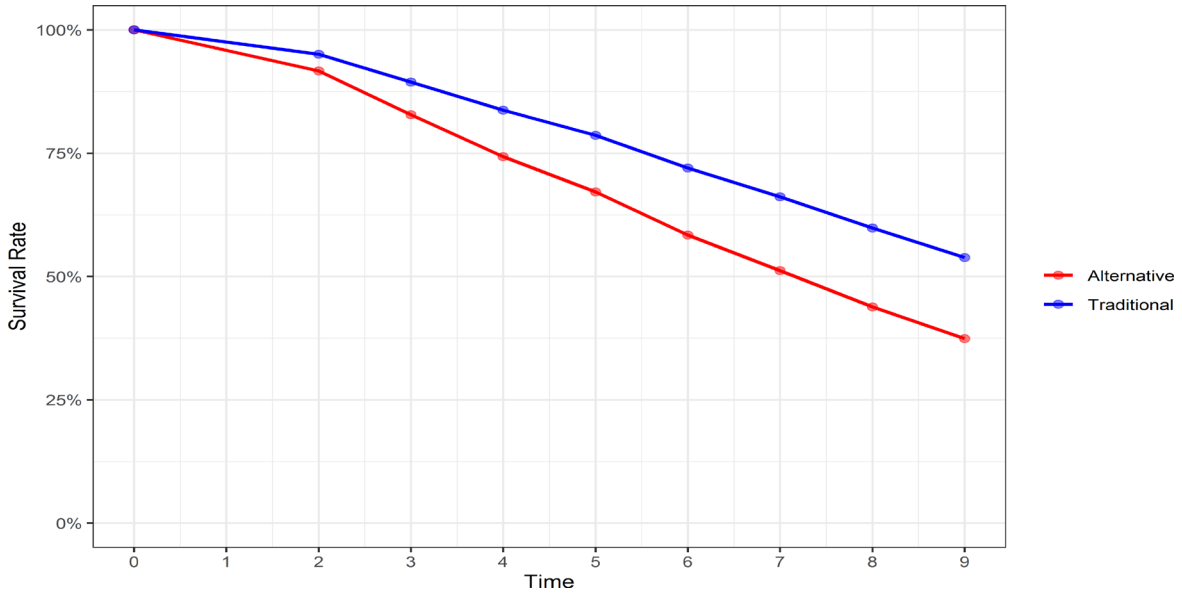


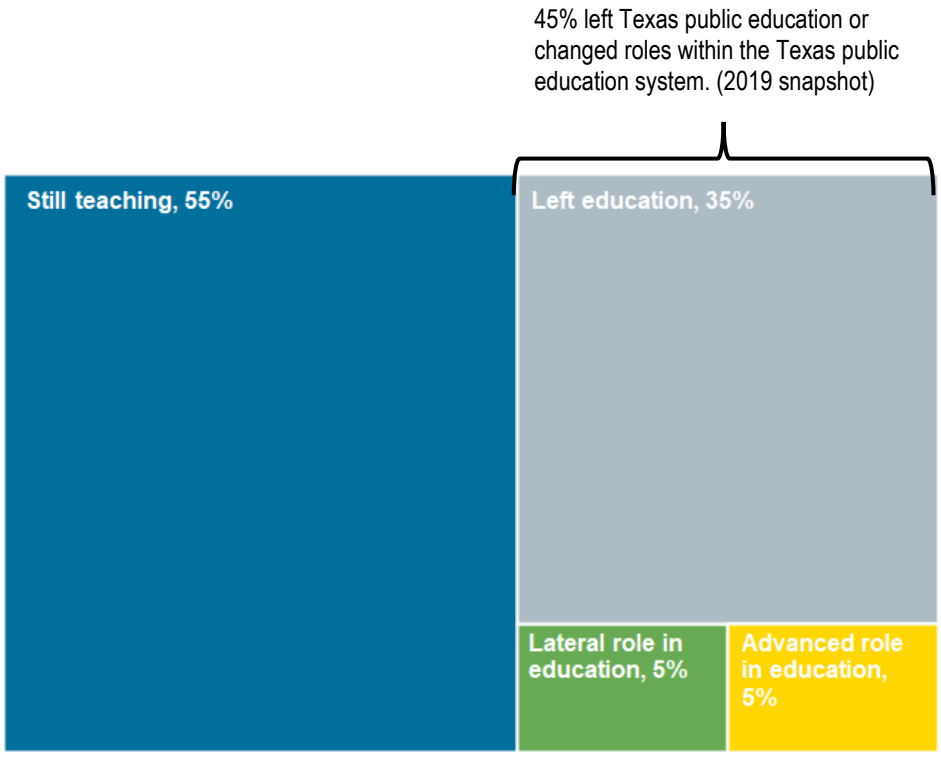
Figure 5 shows the survival curve obtained from the Cox proportional hazards model that contained main effects with splines included for the continuous covariates. The survival (retention) rate was observed to be higher for traditionally certified teachers compared to alternatively certified teachers. Again, the gap in the rate widens in the latter years.

Figure 5: Cox proportional hazards adjusted survival rates



Of the total 2010 cohort across both pathways, 45% left their original teaching position to move either outside or within the education system and 55% were still in their original teaching position by 2019. Thirty-five percent left the education system completely, while 5% moved into lateral roles (e.g., librarian, music therapist, teacher appraiser, etc.) and 5% moved into more advanced roles (e.g., principals, superintendents, and other leadership positions) within the education system (see Figure 6 below).

Figure 6: Nearly half of teachers either left the education field or moved to a different role within the education field.



When we disaggregate the data further, we found that 1) Black and Hispanic/Latino/a teachers are more likely to advance professionally in both alternative and university pathways. A higher proportion of Black (9%) and Hispanic (6%) teachers

obtained advanced roles compared to White teachers (4%). These findings show that alternatively certified teachers are finding ways to move up in the system just as much as university teachers, especially teachers of color. This indicates that both pathways are helping to promote teachers' professional growth and leadership within the Texas public education system. 2) Teachers from both preparation programs move to advanced roles approximately as well as they do to lateral roles. 3) Overall, fewer Hispanic teachers left the education system compared to the teachers belonging to other racial or ethnic categories.

Discussion/Policy Recommendations

Further research is needed to help us understand how educator preparation pathways impact teacher and student outcomes and teacher retention. Without this knowledge, we lack the evidence base needed to make informed decisions for improving programs and policies within the Texas public education system.

Recommendation 1: Provide comprehensive and systematic support for teachers in their first three years of teaching to improve teacher retention and quality. Provide legislative funding for mentoring (developmental feedback/observation-based coaching) and induction support to improve the effectiveness and overall well-being of novice teachers.

School districts need support to provide more effective onboarding of novice teachers and to provide dedicated personnel to direct and oversee induction support efforts in coordination with Educator Preparation Programs (EPPs). This support should be aligned with strong campus and district instructional support and leadership models for all teachers. Additionally, collaborations with Texas public universities, Education Service Centers, and alternative certification programs should be extended to support these efforts.

Recommendation 2: Create more accessible, feasible, and affordable pathways to teacher certification programs that demonstrate higher levels of teacher retention and student achievement.

2A: Colleges of education, which have a primary role in establishing the evidence base for what constitutes effective teaching and learning, should ensure that their graduates are equipped to make a lasting difference in the schools and communities they will serve.

Texas public universities should create more timely, affordable, and accessible pathways for teacher certification programs in addition to the more traditional university pathways that currently exist. This should include the provision of financial support which is available to other types of post-baccalaureate students, such as tuition remission and stipends when involved in student teaching. For teacher prospects who are already degree holders, Texas public universities should create more accessible and affordable pathways towards certification.

As a state policy priority to combat the problem of teacher turnover, the state should provide incentives to public universities to provide more accessible pathways to university-based teacher certification; for example, providing scholarships for teacher candidates pursuing university-based certification programs.

2B: Texas school districts, community colleges, and universities should create and/or redesign efforts to provide seamless pathways that expose, inspire, and support young people to pursue and complete careers as teachers.

State policy and regulations should incentivize the pathways to teacher certification through grants and funding, to encourage high schools, community colleges, and Texas universities to create pathways to certification based on quality dual credit, internships and aligned curriculum that transfers, resulting in students earning a high school diploma, Associates Degree (AA) and Baccalaureate (BA).

University programs should create options to increase opportunities for teacher candidates to test out of credit courses and dual credit to increase completion of teacher certification through university-based programs.

State policy and regulations should support innovations locally with "stackable credentials"[2] to create more opportunities for current teachers' aides and other lay professionals to earn university degrees and become certified teachers.

Interest or non-interest in teaching is often established early in the education pipeline before students enter postsecondary education. State Board for Educator Certification (SBEC), Texas community colleges, and Texas public universities should work to coordinate with grants and programs such as "Grow Your Own"[3] that cultivate early interest and community-based development in teaching.

Recommendation 3: Provide greater transparency around the practices and outcomes of different EPP models.
The SBEC should increase the clinical hour requirements for teachers for those pursuing an alternative certification as a late-hire[4] candidate before they serve as a teacher of record. In 2018-2019, 95% of late hires came from alternative certification programs.

SBEC should increase reporting and accountability requirements around late-hire teachers to disincentivize teacher candidates starting as a teacher of record without classroom-based experience.

Because current Texas "late hire" provisions make it possible for initial teacher hires to enter classrooms without yet fulfilling all certification requirements, SBEC should add additional incentives for teacher candidates to be hired earlier in the year and receive training during that time.
SBEC should increase transparent data reporting on student outcomes by program type to differentiate quality among programs and to determine state action for lower performing programs.

[2] Credits from a certificate can be "stacked" toward an associate degree, then credits from an associate degree (AA) can count toward a baccalaureate (BA) degree. The "stackable credentials" process lays out a set of courses or credentials that are related and acceptable to a specific university-based teacher preparation program where the institution agrees to provide credit or admission to the teacher preparation program given their course of program. Furthermore, these programs can target pathways to teacher certification for paraprofessional, teachers' aides, and other education certificates.
[3] The Grow Your Own program is grant-funded by TEA where there is an organizational agreement between the higher education institution and high schools. The high schools identify potential future teachers beginning in the sophomore or junior year. The higher education institution agrees to admit these identified students into their university-based teacher preparation program. These programs should be increased and continue to have funding by the state.
[4] New teachers allowed to defer all educator preparation requirements apart from program admission until after they begin teaching full-time.