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Exploring Students' Endorsement Enrollment in Texas Public High Schools

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College and career readiness has recently received increased attention from educators, researchers, and policymakers. In 2010, the U.S. Department of Education set a clear goal: "every student should graduate from high school ready for college and a career, regardless of their income, race, ethnic or language background, or disability status" (2010, p. 3). There is no doubt that the implementation of college- and career-ready standards and the development of assessment tools has been a critical priority for American high schools during the past decade. The U.S. Department of Education's *Blueprint for Reform* (2010) called on all states to "develop and adopt standards in English language arts and mathematics that build toward college- and career- readiness by the time students graduate from high school" (p. 3).

To achieve these goals, many states have adopted new policies on college and career readiness that include rigorous academic content standards and advanced coursework options. While most states are currently implementing the Common Core State Standards, Alaska, Texas, and Virginia have developed their own college and career readiness standards. Twenty-five states, including Texas, require school districts to offer advanced coursework, such as advanced placement (AP), international baccalaureate (IB), and dual enrollment (Glancy et al., 2014).

In this study, we focus on the state of Texas, which has the second-largest youth population in the nation and represents about 10% of the 73 million youth under age 18 in the U.S. (United States Census Bureau, 2018). Texas has experienced a large increase in the youth population in the past decade. From 2006 to 2016, the Texas youth population grew by 13.2% (Kids Count Data Center, 2017). Between 2003 and 2013, public school enrollment in Texas increased by 19.0%, more than six times the average increase rate (3.1%) of the nation (Texas Education Agency [TEA], 2017, p. ix).

To encourage early motivation for college and careers, the Texas Legislature passed House Bill 5 and adopted a new Foundation High School Program (FHSP) in 2013. This new program, implemented in the academic year of 2014/15, allows students to enroll in one or more endorsements, or areas of study: Science, Technology, Engineering, and Mathematics (STEM), Business & Industry, Public Services, Arts & Humanities, and Multidisciplinary Studies. Similar programs are also found in other states, such as Colorado, Idaho, Mississippi, North Carolina, South Carolina, and South Dakota, offering forms of advanced diplomas that include specific endorsement pathways (Education Commission of the States, 2019). Texas legislators expect that focused endorsement pathways will help students gain in-depth knowledge in specific subject areas and pursue academic and career interests beginning as soon as high school entry (TEA, 2019a). The FHSP program offers many benefits to students, since endorsements are also designed to contribute to the alignment of coursework and assessments between K-12 and postsecondary education (Callan et al., 2006).

To understand participation in the new FHSP program by *all* Texas high school students regardless of gender, race/ethnicity, socioeconomic status (SES), English as a second language (ESL) status, or disability, a thorough exploration of students' school records is required. As one of the earliest efforts in the state and the nation to examine Texas FHSP with restricted-use, statewide longitudinal data[1], this study was purposefully designed to reveal the mapping of 9th graders' endorsement enrollment and examine specifically the student endorsement selection through an equity lens. Thus, the overarching question of this study was: For Texas 9th graders presented with the opportunity to enroll in any of the five endorsement pathways, what is chosen and by whom? Through the examination of student endorsement enrollments (i.e., potentially limited by endorsement offerings in their school district), we identified structural and societal barriers that limit access to the opportunities supposedly intended for all students in the endorsement policies.

Literature Review

College and Career Readiness

College readiness is frequently defined as students' preparation in specific content subjects, including math, reading, and writing (Adelman, 1999, 2006; Barnett et al., 2012; McClarty et al., 2017). Researchers have used standardized test scores and state accountability indicators for college readiness (Darling-Hammond et al., 2014; Malin et al., 2017). Evidence of readiness has also traditionally been measured through students' curricular accomplishments in high schools, such as advanced course-taking and grade point averages (GPAs) (Long et al., 2012). Since best indicators of college and career readiness include low college remedial rates (Conley, 2012), state and postsecondary remedial and placement policies have been adopted across the nation to communicate CCR standards to schools and students, promote alignment between K-12 and higher education, clarify the role of institutions in providing remedial services, and encourage high school students' academic preparation (Glancy et al., 2014).

Research suggests that enrollment and achievement in courses leading to specific postsecondary pathways is essential to students' careers. Long et al. (2009) found that students' readiness for college-level math depends on the type of math courses taken during high school. Crosnoe and Johnson (2011) argued that high school course-taking patterns help students understand the broad range of fields of study offered by colleges and universities, and thus contribute to a smooth transition to postsecondary education. Adamuti-Trache and Andres' (2008) longitudinal research demonstrated strong relationships between course-taking patterns and participation/choice of postsecondary institutions, as well as a choice of college majors, particularly in science-related fields of study. There is some agreement that college-going students would benefit from early curricular preparation needed for acceptance into a postsecondary program and information to make appropriate course choices (Frenette, 2010; Reynolds et al., 2006). Course selection presumes that students understand their goals and engage in educational planning (Sweet & Anisef, 2005). Choices reflect students' curricular interests and previous achievement (Adamuti-Trache & Sweet, 2014), and are guided by teachers,

[1] This work was supported in part by a grant from the Greater Texas Foundation. This project was also supported (2016-18) by Texas OnCourse Network at the University of Texas at Austin. Data analysis was conducted at the Education Research Center (ERC) at UT Austin; we thank ERC for their assistance and support. The findings do not necessarily reflect the opinions of the ERC, or of the state agencies providing the data, Texas Higher Education Coordinating Board (THECB), Texas Education Agency (TEA), Texas Workforce Commission (TWC), or Greater Texas Foundation.

counselors, and parents who are more knowledgeable of the curricular pathways from high school to higher education (Schur, 2015). As noted by Conley (2007), "it is critical that students begin their journey toward college readiness before they arrive in high school" (p. 28).

Until recently, the lion's share of attention and research has been cast toward college-preparation over career readiness. However, the authorization of the Carl D. Perkins Vocational Education Act of 1984 and its reauthorization in 2006 as the Carl Perkins Career and Technical Education Act[2] have revived interest in vocational education such as that available through community colleges or apprenticeships (Brand et al., 2013; Rosenbaum, 2001) and inclusively considered any type of training Americans need to get more than a high school diploma. In particular, Symonds et al. (2011) call for a stronger focus on career-related programs to meet the needs of the "forgotten half" of the youth population who do not attend or complete college. Such programs have also been promoted by international organizations as an educational alternative to general education (e.g., Kuczera & Field, 2013). Research shows that readiness for the school-to-work transition has many facets, and "engaging in work-based learning and exploration" and receiving "active support from adults, coupled with an orientation to the adult world, is particularly facilitative in promoting readiness for an adaptive transition" (Phillips et al., 2002, p. 212). Clearly, career readiness should be assessed as an important asset for high school students, especially for those who do not intend to enroll in college.

A model of college and career readiness was put forward (Conley, 2010, 2012) and adopted by many states as reflected in high school curriculum and graduation standards (Callan et al., 2006). As defined by Conley (2012), "A student who is ready for college and career can qualify for and succeed in entry-level, credit-bearing college courses leading to a baccalaureate or certificate, or career pathway-oriented training programs without the need for remedial or developmental coursework" (p. 1). Conley's (2012) framework highlights readiness in four areas that prepare students for post-high-school transition, including key cognitive strategies, key content knowledge, key learning skills and techniques, and, key transition knowledge and skills.

Legislative and Policy Steps toward High School Endorsements in Texas

Inspired by the work of Callan et al. (2010) who examined areas of public policy that build a state college readiness agenda, Blume and Zumeta (2014) reviewed recent state initiatives that emphasize college and career readiness standards by adopting school success plans, district performance metrics, and reform strategies. They stated that states should implement systemic policy change to ensure "adoption of readiness standards, aligning assessments with readiness standards, and a public school curriculum that reflects statewide standards" (Blume & Zumeta, 2014, p. 1075). Other studies (e.g., Chait & Venezia, 2009) have recommended additional policy initiatives such as dual credit enrollment, early college high schools, and career and technical education aligned with postsecondary preparation. A state by state examination of college readiness scores based on five policies (i.e., P-20 data availability, P-20 governance structure, dual enrollment, advanced course offerings, statewide assessment) placed Texas at the top of the list, with the highest aggregate college policy readiness score (Blume & Zumeta, 2014).

Since 2000, statewide plans to increase college attainment have been the focus of Texas educational agencies and Legislature, culminating with the *60X30TX* strategic plan that proposes that 60% of young adults (25-34 years of age) will complete some postsecondary credentials by 2030 (Texas

[2] In 2006, the name Vocational Education was also replaced with Career and Technical Education [CTE].

Higher Education Coordinating Board [THECB], 2015). The implementation of House Bill 5 (HB 5) is intended to increase the college and career readiness among Texas high-school students and thus serve the state *60X30TX* strategic plan. For instance, HB 5 endorsements are mentioned among the strategies to link more seamlessly "guided pathways" at higher education level to K-12 (Cullinane Hege, 2019). In 2018, about 29% of the higher education institutions involved in collaborative activities with high schools mentioned the alignment of endorsements with fields of study curriculum in their Higher Education Assistance Plans (THECB, 2019).

Terry et al.'s (2015) report on HB 5 included some data on the history and political context that led to the implementation of endorsements. The report asserted that 2006's HB 1 started "a long and fitful history of education reform efforts" (p. 14) aimed at shaping education policies on college and career readiness rigor. To ensure college preparedness, the high school graduation plan included four credits each of English Language Arts, Mathematics, Science, and Social Studies. The following legislation focused on implementing a more rigorous curriculum by instituting testing initiatives that led to the new State of Texas Assessments of Academic Readiness (STAAR) and end-of-course exams.

In 2009, the Legislature passed HB 3 focused on public school accountability and curriculum content, approving for the first time, that a student could satisfy some math and science credits through Career and Technical Education classes. This has been an important step in linking academic and technical content from secondary to postsecondary education, and building partnerships among K-12, workforce, and higher education institutions (National Forum on Education Statistics, 2015). Indeed, "for careers that require less than a four-year postsecondary degree, K-12 CTE programs provide important preparation for employment and workforce training" (p. 31), that can be continued through technical training at the postsecondary level. In alignment with these national trends, the HB 3 legislation in Texas gave assurance to parents and employers that high school graduates are either college- or workforce-ready. The HB 3 bill analysis (HRO, 2009) specified that "the bill would give students more flexibility in coursework to pursue their individual interests, while still ensuring a quality education. Having multiple pathways with equal rigor would be important to help each student reach his or her full potential" (p. 19). However, the differentiated curricular tracks created around CTE that require fewer and less stringent math and science courses in the upper high school years could be interpreted as an incremental move toward a tracking system that might become "a second class track into which minorities and other disadvantaged groups would be funneled" (Kuczera & Field, 2013, p. 21).

In 2013, following the budget cuts implemented during the 82nd Texas legislative session, the dissatisfaction of parents with the number of standardized tests (e.g., fifteen end-of-course exams) needed for graduation and the concerns of employers that Texas students were not ready to enter the workforce were important factors in the passage of HB 5 (Sikes, 2018; Terry et al., 2015). The bill created a framework for students to explore their own career interests in high school, motivate them to graduate, and thus improve college and career readiness for all. The choice of one or more of five endorsements (STEM, Business & Industry, Public Services, Arts & Humanities, and Multidisciplinary) became the mechanism intended to engage high school students in shaping their own career pathways. Texas was the first state to mandate the development and use of college and career readiness standards (Barger et al., 2011).

Texas High School Curriculum: A Social Equity Perspective

As recognized by Sikes (2018), the 2013 HB 5 passed by the 83rd Texas Legislature "impacted school curriculum standards and broadened support for career and technical education in an attempt to remedy social and economic issues through workforce preparation in schools" (p. 103). The five endorsements added to FHSP were expected to supplement students' academic preparation, thus better aligning the Texas secondary curriculum to Conley's (2012) framework.

The design and implementation of the FHSP program has not been without challenges. *Texas House Bill 5* indicates "a clear interest from state policymakers in enhancing and assessing the relationship between education and economic growth" (Sikes, 2018, p. 103). Through the program, high school students learn about workforce needs and occupational destinations, and also have the opportunity to choose high school endorsements expected to match their interests for specific academic and career pathways. This strategy resembles the public and private goals that Labaree (1997) identified in the history of American schooling: a social efficiency approach (i.e., training productive workers for a market society) and a social mobility approach (i.e., preparing individuals to compete for social positions along career pathways). Since social efficiency goals can generate a social reproductive vision "reinforcing the existing structure of social inequality by adapting newcomers to play needed rather than desired roles within this structure" (p.61), there is a major concern that social mobility goals are not met for all students.

In theory, equal access to educational opportunities, regardless of family background, contributes to individual social mobility (OECD, 2018). However, scholars who focus specifically on the role of school curriculum on social mobility, question if equity in education can be achieved when advantages associated with career pathways are accounted for by the school curriculum studied (Iannelli, 2016). Research has specifically examined school practices such as ability grouping or curriculum tracking that benefit predominantly middle- and upper-middle-class White students but raise social equity concerns for students of color and/or lower-income students (Archer et al., 2018; Labaree, 1997; Loveless, 2009; Lucas, 1999, 2001; Oakes, 1985). Curriculum tracking within-schools has been the practice of grouping students in separate classes based on some measures of achievement or perceived ability. Ability grouping is one method by which educators differentiate instruction (Ireson & Hallam, 2001) to create temporary classroom placements that better match students' needs (Steenberger-Hu et al., 2017). Ability grouping is the basis of AP courses (Hallinan, 2005), it is used to enhance student learning and engagement in mathematics classrooms (Zevenbergen, 2003), and is applied to improve the skills of English learners through content-based English-language-acquisition curriculum (Callahan, 2005). In all these situations, students are to some extent "evaluated and subsequently receive a differentiated curriculum" (LeTendre et al., 2003, p. 44).

A significant body of research on school stratification (e.g., Lucas, 2001) asserts that some forms of tracking that allocate students to different curricula and/or pathways have become part of student educational transitions with negative effects on social mobility. Lucas explains how social inequality is maintained when privileged students and their families seek out qualitative differences in education through a "stratified curriculum." For instance, TEA's (2020) reports on participation in AP or IB programs show systemic social class differences: in 2018-19, only one-fifth (19.7%) of economically disadvantaged students enrolled in AP or IB programs compared to nearly one-third (31.3%) of those not economically disadvantaged. Some also argue that the practice of setting or tracking represents "a powerful and pernicious tool within the social reproduction of unequal power relations" (Archer et al., 2018, p. 136). It could create a challenging environment for certain students (Preckel

et al., 2010) and be perceived as a stigma by students allocated to "lowest sets" who experience a form of "symbolic violence" (Bourdieu & Passeron, 1977/2000).

While the differentiated endorsement tracks shape Texas students' courses and curriculum and place them on different paths regarding college and career readiness standards, there is no evidence yet "what different endorsements signal to employers or colleges about students' readiness, academically and otherwise" (Sikes, 2018, p. 105). On a positive note, Texas FHSP consists of a single basic academic track that requires 22 credit hours, which can then be customized with one or more endorsements. The additional curricular requirements bring the total up to 26 credit hours (TEA, 2019a), which means only about 15% of the curriculum is differentiated and students have some flexibility along the endorsement pathways.

While in the long term, FHSP could respond to a public goal toward social efficiency and boost economic growth through adjustments in the secondary curriculum (Labaree, 1997), one should note that stratified individual choices of endorsements may create social inequity if there is variance in school endorsement availability (Terry et al., 2015) or parents and counselors are not prepared to inform student's choices (Schur, 2015). As concluded by Sikes (2018), "this variance constitutes the gray area of the theory of social mobility through education that Labaree (1997) explained: everyone may have equal opportunities, but realizing equal achievement is improbable" (p. 107). Therefore, our study is first guided by Conley's framework that highlights college and career readiness for post-high-school transition through endorsement choices, in support of individual and common economic growth. Second, the study is informed by social justice theories (e.g., Archer et al., 2018; Labaree, 1997; Loveless, 2009; Lucas, 1999, 2001; Oakes, 1985; Rosenbaum, 1976) that denounce how forms of curriculum tracking may create unequal education and career opportunities if there are noticeable patterns of uneven participation along some academic tracks by students from disadvantaged backgrounds.

Method

Focusing on students presented with the opportunity to enroll in any of the five endorsement pathways, this study aimed to better understand the mapping of 9th graders' endorsement enrollment in the FHSP program. We addressed the following research questions:

1. What are the differences in endorsement enrollment reporting (e.g., participation in FHSP, missing data) by student sociodemographic and academic characteristics?
2. For students reporting participation in FHSP, what are the differences in endorsement choices by sociodemographic characteristics, special student populations and instructional programs, and pre-high-school academic achievement?

Data Source and Study Population

The data used in this study were drawn from a restricted, statewide longitudinal database that contains rich information of all students in the public education system in Texas. We purposefully chose to focus on 9th graders enrolled in Texas public high schools in 2015/16 which is the second cohort under the effect of the new FHSP program. Our rationale was that school districts may have needed

time to develop and implement the program, and to properly collect and report the data[3]. We further narrowed our selection to those who had a unique student ID and complete endorsement records, which represent about 95% of the entire cohort. We used both enrollment and achievement data for these students and created a dataset that consists of student characteristics, pre-high-school preparedness, endorsement enrollment, and school district characteristics.

There was an important school-related restriction in selecting the study population for the endorsement analysis. Although FHSP is a Texas-wide graduation program, in its early stage of implementation, some school districts struggled and failed to offer students all five-endorsement options (Terry et al., 2015). As a result, not all students had equal access to all endorsement options, so enrollment may not reflect student's first choice in districts with limited endorsement offerings. To control for this access issue and to better understand what students would have chosen if all offerings were available, we selected only school districts in which all five endorsements were presented. While we recognize the importance to learn more about the characteristics of the districts that experienced challenges to implementing all five endorsements and of the students who had to make endorsement choices under these circumstances, we limit our study to examining endorsement enrollment of students who had access to all endorsements within their school districts. Although this approach constitutes a limitation by not considering institutional characteristics that may reduce student access, restricting the 9th graders to the student population enrolled in school districts that offered all five endorsements allows us to use enrollment in an endorsement as a proxy of choice and likely an indicator of 9th graders' future career interests, as intended by the HB 5 legislation (TEA, 2019a).

In total, 365,041 students, who represented 85.2% of the 2015/16 cohort, enrolled in the selected school districts. As shown in the Appendix, even in districts that offered a complete palette of endorsements, about 5% of student records have missing endorsement data. Although these records could not be included in the analysis of endorsement choices, we briefly examined the profiles of students with missing data. The study population with available endorsement data was further reduced to 346,742, which represented about 81% of the cohort of 9th graders enrolled in Texas public schools in 2015/16. The Appendix presents more details on missing endorsement data and student characteristics comparing the selected research study population and the initial 2015/16 cohort. Although differences are not notable, the study population has a slight academic and socio-demographic advantage.

Variables and Measurements

Endorsement enrollments are the key variables in the study. As students can enroll in more than one endorsement, we used five dichotomous variables describing enrollment in each of the five areas (Yes=1; No=0 indicates no endorsement choice, even if a student will graduate under FHSP).

The definition of student characteristics follows the Public Education Information Management System (PEIMS) standard reporting (e.g., TEA, 2016). Independent variables included sociodemographic variables (i.e., gender, race/ethnicity, economically disadvantaged[4], immigrant), indicators of

[3] Based on our initial data examination, the endorsement information was more complete for the second cohort than for the first cohort (fewer missing cases). Although it is likely that some students joined the program later during high school, our interest for this paper was about the immediate response of school districts and students.

[4] Economically disadvantaged = Students qualified for free or reduced-price lunches for the best six months during the preceding federal fiscal year

special student populations and instructional programs (i.e., special education, gifted, at-risk[5], limited English proficiency [LEP], English as a second language [ESL], and CTE), and pre-high-school achievement. We used dichotomous variables for gender, immigrant status, economically disadvantaged, special education, gifted and at-risk status. Students' race/ethnicity was coded into six groups: Asian, African American, Hispanic, Indigenous People (i.e., American Indian, Alaska Native, Pacific Islander, Native Hawaiian), Multiracial, and White. To better indicate the needs and actual support received by students with LEP, we combined LEP and ESL into a single variable with three categories: a) neither need nor support for English improvement (LEP=0, ESL=0); b) LEPs with no ESL support (LEP=1, ESL=0); c) LEPs who received ESL support (LEP=1, ESL=1). As expected, non-LEP students were not enrolled in ESL programs. Finally, CTE included three categories: a) no CTE enrollment; b) enrollment in some CTE courses; c) coherent sequence of CTE courses.

Variables concerning pre-high-school academic preparedness were primarily measured by student performance in standardized grade 8 tests. The *State of Texas Assessments of Academic Readiness* (*STAAR*) program, which was implemented in Spring 2012, offers annual assessments in various subjects for students in different grades. In grade 8, students are required to take STAAR tests in reading, social studies, mathematics, and science. In high school, students take the end-of-course (EOC) assessments for English I, English II, Algebra I, Biology, and U.S. History. However, students who are on accelerated academic paths may take some of these tests earlier. For instance, students can take grade 8 STAAR tests in grade 7 or take Algebra I in grade 8. To account for these pathways, during our data screening and preparation, we explored more than one year of data to create an achievement file for the study population. For instance, we found approximately 6% of the students who took their grade 8 STAAR tests in all subjects in grade 7. In addition, we found that about 9% of the students took the STAAR EOC Algebra I exam (normally taken in grade 9), without having to take the grade 8 STAAR math test.

All STAAR and EOC tests were graded on three levels of academic performance[6]: Level I (unsatisfactory, recommended), Level II (satisfactory, recommended), and Level III (advanced), which is the coding we used for Reading, Social Studies and Science. However, we created a new variable Math/Algebra that combined grade 8 Math and Algebra I levels. Since Algebra I has a higher level of difficulty, and some students took both math and algebra exams, we proposed five achievement levels for the new variable. That is, the first three levels were the same as Levels I, II, and III in 8th grade Math, unless students took Algebra I and obtained a satisfactory or advanced performance, coded Level IV and Level V, respectively.

Analytical Procedure

Since the study uses the entire population of Texas 9th graders who had the opportunity to enroll in any of the five endorsements in their school districts, we are not bound to inferential statistics that rely on a sample to infer to a population. Rather, the main objective of the study is to provide

[5] At-risk = Students who meet the criteria for one or more of the 13 indicators established by the PEIMS data standards (TEC §29.081(d)).

[6] We used the 'Recommended Satisfactory Level' as a measure of performance because it indicates whether a student met grade level expectations, and it matches the 'Meets Grade Level' indicator used since 2016/17. Since the 2015/16 STAAR state reports are based on 'Phase-in Satisfactory Levels' of performance with cut-off scores adjusted yearly, we caution the reader that our performance level results are not comparable with state reports data. Also, since 'Recommended satisfactory levels' have higher cut-off scores, we believe they are more relevant to college and career readiness standards.

descriptive statistics of the endorsement enrollments mapping by sociodemographic characteristics, indicators of special student populations and instructional programs, and pre-high-school academic achievement. Analyses were conducted in SPSS 26.

Results

First, the study explored endorsement enrollment reporting to help elucidate policy implementation issues of the new FHSP program. Second, the mapping of endorsement choices by student characteristics helps to discuss student choices and concerns of equity and inclusion.

Endorsement Enrollment Reporting: Student Profiles

The descriptive statistics indicate that, among the 9th graders enrolled in school districts that offered all five endorsements, approximately 5.0% (n = 18,299) had missing endorsement information[7], 3.2% (n = 11,700) chose no endorsement in grade 9 even if they are expected to graduate under the FHSP program[8], and 91.8% (n = 335,042) selected at least one endorsement. Thus, we first examined if any differences exist among these three categories of students (see Table 1). Since all students were enrolled in school districts that offered all five endorsements, we hypothesize that differences in endorsement enrollments, if any, may be related to systemic inequities inherent to the system as suggested by social justice theorists (e.g., Archer et al., 2018; Labaree, 1997; Loveless, 2009; Lucas, 1999, 2001) rather than operational reporting issues within districts. As a matter of fact, students with no endorsement are deprived of educational opportunities created through the FHSP program.

Table 1 shows clear disparities in student distributions among the three groups in the FHSP cohort: those with missing endorsement data, no endorsement selected in Grade 9, and at least one endorsement. The missing data and no endorsement groups have higher percentages of African American and Hispanic, economically disadvantaged, LEP/ESL, special education, and at-risk students. These groups also had higher percentages of students with incomplete grade 8 academic records, as reflected in their higher percentages of cases with missing information on STAAR exams. About one-third and one-quarter of students with missing data or no endorsement, respectively, had missing grade 8 STAAR information, which could be the result of higher student mobility during the academic year that hinders data collection and reporting. This suggests an accumulation of instructional disadvantage over time, which could reduce the likelihood of academic progress and success of these students. However, these two groups who demonstrated signs of academic challenges, did not appear to take advantage of the CTE program that supports vocational education (Rosenbaum, 2001; Symonds et al., 2011). For instance, only 13% of students with no endorsement were enrolled in a coherent CTE sequence.

[7] Missing endorsement data may correspond to students who do not graduate under FHSP, if they started high school before 2014/15 (Texas Education Agency, 2019b) or they received special education or related services.
[8] No endorsement choice may indicate delayed enrollment or being approved for FHSP graduation without earning an endorsement (TAC §74.11) if parents signed endorsement opt-out agreements.

Table 1

Endorsement Enrollment Reporting by Student Characteristics (column %)

	Missing endorsement (*n*=18,299)	FHSP study population (*n*=346,742)	
		No endorsement (*n*=11,700)	At least one endorsement (*n*=335,042)
Gender			
Female	41.9	45.5	48.3
Male	59.1	54.5	51.7
Race/Ethnicity			
Asian	1.1	4.4	4.2
African American	19.6	20.5	12.8
Hispanic	62.4	56.4	52.4
Indigenous	0.6	1.0	0.5
Multiracial	1.3	1.4	2.1
White	15.0	16.3	28.2
Economically Disadvantaged	71.9	68.9	55.2
Immigrants	3.6	5.1	2.2
LEP/ESL Status			
No LEP/No ESL	82.1	77.0	86.8
LEP/No ESL	3.1	4.2	3.6
LEP/ESL	14.8	18.7	9.6
Special Education	16.0	17.1	8.5
Gifted	4.1	5.6	9.6
At-risk	77.0	66.5	52.8
CTE			
No CTE	41.6	44.0	35.7
Some CTE	29.3	43.4	32.1
Coherent CTE	29.1	12.6	32.2
Reading			
Level I	51.7	53.4	54.3
Level II	9.3	12.1	18.2
Level III	7.1	10.1	19.7
Missing	32.0	24.2	7.8
Social Studies			
Level I	60.6	63.7	69.9
Level II	4.5	6.9	12.4
Level III	2.8	5.0	10.1
Missing	32.1	24.4	7.6
Science			

Level I	56.1	57.9	59.9
Level II	7.3	10.4	18.0
Level III	4.4	7.5	14.6
Missing	32.1	24.3	7.6
Math/Algebra			
Level I	52.0	51.4	51.3
Level II	8.6	10.8	17.4
Level III	1.2	2.1	2.7
Level IV	2.0	3.6	6.3
Level V	3.1	5.8	12.7
Missing	33.2	26.3	9.5

This brief analysis reveals that even in school districts that were able to offer all five endorsements as part of the new FHSP graduation program, not all students benefited of the endorsement initiative designed to increase their college and career readiness, and guide their future career paths. The findings suggest that differences in endorsement enrollment reporting reflect social stratifications that exacerbate inequities in access to educational opportunity. Findings also support the notion that some students accumulate educational disadvantages over time which becomes an impediment to their academic progress and success.

Student Endorsement Choices

The study population consists of 346,742 students who participate in FHSP (i.e., have endorsement data) and are enrolled in school districts in which all five endorsements were offered. In this context, we argue that enrollments in specific endorsements represent students' (or parents') choices[9] likely guided by academic counselors, and could indicate their intentions for future career paths. Most of the students in the study population (84.8%) enrolled in one endorsement, while 9.3%, 2.1%, 0.4% and 0.1% enrolled in two, three, four and five endorsements, respectively. A brief examination of the student population enrolled in more than one endorsement shows an overrepresentation of female students, gifted students, those who are not economically disadvantaged or at-risk, enrollees in coherent CTE programs, students with no LEP problems, and higher achievers in Grade 8. For these groups, data show high percentages enrolled in 3 or 4 endorsements, which suggests students who have some academic advantage are taking a broad range of courses to fulfill several endorsement requirements and to keep options open for both college and career pathways. A small proportion of the 9th graders (3.4%) did not enroll in any endorsement by grade 9 (as shown in the previous section).

Overall, the largest group of 9th graders enrolled in Multidisciplinary Studies (28.9%), followed by Business & Industry (26.7%), Public Services (23.8%), STEM (16.9%), and Arts & Humanities (15.3%). We present the endorsement choices within each student group identified by

[9] We acknowledge that endorsement enrollments are affected by many student, family, school factors including student academic history that may constrain the choice-making process for some groups of students. Therefore, terms like *choice* or *interest* should be interpreted with caution particularly when adopting a social justice lens that is questioning curricular tracking. However, this terminology that may empower students is used in HB 5 legislation and other documents available to students and parents (TEA, 2019a), so we used it cautiously in this study

sociodemographic characteristics (Table 2), membership of special student populations and instructional programs (Table 3), and pre high-school achievement levels (Table 4).

Student Sociodemographic Characteristics

Table 2 shows the percentages of students enrolled in each endorsement by various student characteristics; the following section highlights the main findings for each characteristic. For instance, we may ask: what percentage of female students in the study population enrolled in each of the five endorsements? Are these percentages different for male students?

Table 2

Endorsement Choices by Student Characteristics (row %) (*n*=346,742)

	n	STEM	Business & Industry	Public Services	Arts & Humanities	Multidisciplinary
Gender						
Female	167,136	12.5	19.2	32.9	19.6	28.8
Male	179,606	20.9	33.7	15.4	11.3	29.0
Race/Ethnicity						
Asian	14,708	37.1	13.4	19.1	13.7	35.3
African American	45,366	12.4	28.2	23.2	13.7	27.6
Hispanic	182,018	14.7	28.3	27.0	15.4	24.9
Indigenous	1,925	16.0	27.7	22.1	13.8	25.8
Multiracial	6,243	18.6	22.8	19.9	17.2	34.3
White	96,482	19.9	25.2	19.1	16.0	35.8
Economic Disadvantage						
Yes	192,935	13.4	29.4	26.9	14.9	24.7
No	153,807	21.2	23.3	20.0	15.8	34.2
Immigrant Status						
Immigrants	7,841	11.3	24.1	18.4	13.8	34.1
Non-immigrants	338,901	17.0	26.8	24.0	15.3	28.8

Note. The sum of row percentages is above 100% because students may take more than one endorsement.

Gender. Career path intentions and, by extension, endorsement choices are marked by gender differences. Compared to 20.9% of males in the study, only 12.5% of females chose the STEM endorsement. Further, while male students prefer Business & Industry (33.7%), female students prefer Public Services (32.9%). Compared to male students (11.3%), females are also showing a higher preference for Arts & Humanities (19.6%). There are no gender differences in the choice of a Multidisciplinary endorsement.

Race/ethnicity. Racial/ethnic differences were also revealed in endorsement enrollments. For instance, STEM is the choice of 37.1% of Asians in contrast to only 12.4% of African American and

14.7% of Hispanic students. Meanwhile, only 13.4% of Asians are enrolled in Business & Industry compared to much higher proportions among all other racial groups. Enrollment in Business & Industry is particularly high among African American (28.2%), Hispanic (28.3%) and Indigenous (27.7%) students, the three racial groups also showing the largest enrollment percentages in Public Services. There is a more balanced participation in Arts & Humanities, racial percentages varying slightly around the average 15.3% for the study population. However, there is more variability in the racial distributions for the Multidisciplinary endorsement, with percentages as low as 24.9% for Hispanics and as high as 35.8% for White students. For many students, the Multidisciplinary endorsement is added to other endorsement choices.

Economic (Dis)Advantage. Students on free lunch are identified as economically disadvantaged, and they represent the majority of the study population. Students who were identified as economically disadvantaged are less likely than those who were not to enroll to enroll in STEM (13.4% versus 21.2%) and more likely to choose Business & Industry (29.4% versus 23.3%) or Public Services (26.9% versus 20.0%). They are also less likely to choose a Multidisciplinary endorsement (24.7% versus 34.2%).

Immigrants. The immigrant group is very small (2.3% of the study population), but compared to non-immigrants, it shows distinctive endorsement choices for STEM (11.3% versus 17.0%), Public Services (18.4% versus 24.0%), and Multidisciplinary (34.1% versus 28.8%). More than one-third of immigrants chose the Multidisciplinary endorsement, similar to groups like White, Multiracial, and Asian students.

Special Student Populations and Instructional Programs

Table 3 shows the percentages of students enrolled in each endorsement by a special student population or instructional program. For instance, we may ask: what percentage of at-risk students in the study population enrolled in each of the five endorsements? Are these percentages different for students who have not been identified as being at-risk?

Table 3

Endorsement Choices by Special Population and Instructional Programs (row %) (*n*=346,742)

	n	STEM	Business & Industry	Public Services	Arts & Humanities	Multidisciplinary
LEP/ESL Status						
No LEP/No ESL	299,773	17.6	26.1	23.6	15.6	29.6
LEP/No ESL	12,585	15.6	29.6	27.5	14.5	22.3
LEP/ESL	34,384	10.6	30.7	24.8	13.2	25.0
Special Education						
Yes	30,465	7.3	29.8	19.9	13.0	32.0
No	316,277	17.8	26.4	24,2	15.5	28.6
Gifted						
Yes	32,672	33.8	18.0	18.9	18.3	32.6
No	314,070	15.1	27.6	24.3	15.0	28.5
At-risk						

	Yes	184,646	10.9	31.0	25.5	14.1	26.1
	No	162,096	23.7	21.8	21.9	16.7	32.1
CTE							
	No CTE	124,853	17.0	16.4	18.2	22.3	36.7
	Some CTE	112,678	16.6	27.2	23.2	12.6	27.4
	Coherent CTE	109,211	16.9	37.9	31.0	10.1	21.5

Note. Sum of row percentages are above 100% because students may take more than one endorsement.

LEP/ESL Indicator. The three groups identified by Limited English Proficiency status and/or using ESL services are quite different with respect to endorsement choices. The lowest STEM participation is found among the LEP/ESL students (10.6%), consistent with the result obtained for immigrants, most likely LEP/ESL students (Council of Chief State School Officers, 2018). This group shows, however, the highest participation in Business & Industry (30.7%) followed by Multidisciplinary (25.0%) and Public Services (24.8%). In contrast, the NoLEP/NoESL group has higher enrollment in STEM (17.6%), Arts & Humanities (15.6%), and Multidisciplinary (29.6%).

Special Education. Students receiving special education services represent about 8.8% of the study population. This group shows the lowest participation in STEM (7.3%) and has higher participation in Multidisciplinary (32.0%) and Business & Industry (29.8%) endorsements.

Gifted. Meanwhile, gifted students represent about 9.4% of the study population. They are overrepresented in STEM (33.8%), Multidisciplinary (32.6%), and Arts & Humanities (18.3%), and underrepresented in Business & Industry and Public Services endorsements.

At-risk. The at-risk group represents over 50% of the study population with distinctively different endorsement profiles than students not being at-risk. Their participation in STEM is as low as 10.9%, followed by Arts & Humanities (14.1%), Public Services (25.5%), and Multidisciplinary (26.1%). At-risk students show the highest participation (31.0%) in Business & Industry.

CTE. Career and Technical Education is a key strategy in achieving college and career readiness goals. In Texas, the program provides a coherent CTE sequence of courses, or students can take some CTE courses at their choice or none. Table 3 clearly shows the Coherent CTE sequences, which are the most structured, are designed to serve Business & Industry (37.9%) and Public Services (31.0%), which suggests these two endorsements are more oriented toward applied education. Students enrolled in Coherent CTE sequences may also choose the Multidisciplinary (21.5%) and STEM endorsements (16.9%). A similar but less pronounced enrollment pattern is observed among students taking some CTE courses who chose Business & Industry (27.2%), Multidisciplinary (27.4%), as well as Public Services (23.2%) and STEM (16.6%) endorsements. On the contrary, students who did not take any CTE courses, have highest participation in the Multidisciplinary endorsement (36.7%), being followed by Arts & Humanities (22.3%), Public Services (18.2%), and STEM (17.0%). The 'No-CTE' group has lowest participation in Business & Industry (16.4%).

Pre-High-School Academic Performance

Table 4 shows the percentages of students enrolled in each endorsement by academic performance levels in the four Grade 8 STAAR subjects. For instance, we may ask: what percentage of students performing at the highest Level III in Grade 8 Reading enrolled in each of the five endorsements in Grade 9? Are these percentages different for students with other performance levels in reading?

Table 4

Endorsement Choices by Grade 8 STAAR Performance Levels [a] *(row %) (n*=346,742)

	n	STEM	Business & Industry	Public Services	Arts & Humanities	Multidisciplinary
Reading[a]						
Level I	188,119	11.8	31.4	26.2	14.4	25.6
Level II	62,379	20.0	25.0	23.9	16.4	29.3
Level III	67,143	30.1	18.1	20.3	18.1	33.5
Missing	29,101	12.2	20.1	16.9	12.1	38.9
Social Studies[a]						
Level I	241,664	12.8	29.7	26.3	15.1	26.4
Level II	42,339	26.7	22.3	20.5	17.0	31.2
Level III	34,512	37.6	16.5	16.1	17.2	35.4
Missing	28,227	11.7	20.1	16.7	12.1	38.8
Science[a]						
Level I	207,401	11.1	30.5	26.7	15.0	26.4
Level II	61,417	22.7	24.4	22.7	16.8	29.5
Level III	49,755	36.6	17.5	17.2	16.6	32.8
Missing	28,169	11.8	20.0	16.8	12.2	38.7
Math/Algebra[b]						
Level I	177,873	9.7	31.6	26.3	14.6	26.0
Level II	59,467	16.5	26.4	24.7	16.2	28.3
Level III	9,455	27.9	18.9	18.2	14.8	33.2
Level IV	21,666	28.0	21.7	23.0	17.5	30.6
Level V	43,279	39.7	15.7	18.4	16.7	33.9
Missing	35,002	15.6	21.2	18.6	14.2	36.6

Note. Sum of row percentages are above 100% because students may take more than one endorsement.

[a] Reading, Social Studies, and Science, Level I - Unsatisfactory (Recommended); Level II - Satisfactory (Recommended); Level III - Advanced

[b] Math/algebra, Level I - Unsatisfactory (Recommended) Math; Level II - Satisfactory (Recommended) Math; Level III- Advanced Level Math; Level IV- Satisfactory (Recommended) Algebra I; Level V- Advanced Algebra I.

Reading. When comparing endorsement enrollment percentages by the three levels of Reading performance, noticeable gradients for STEM, Arts & Humanities, and Multidisciplinary show that higher reading performance is associated with higher participation in these three endorsements. Thus, 30.1%, 18.1%, and 33.5% of the most proficient readers enroll in STEM, Arts & Humanities, and Multidisciplinary, respectively. On the contrary, Table 4 shows that for Business & Industry and Public Services, higher reading performance is associated with lower participation in these two endorsements. Only 18.1% and 20.3% of the most proficient readers enrolled in Business & Industry and Public Services, respectively. Even more, 31.4% and 26.2% of the poorest readers enrolled in these two endorsements, which suggests students who experience academic difficulties are choosing these endorsements. Students with missing information in Grade 8 STAAR Reading, who are likely to have fallen off track, are significantly overrepresented in the general Multidisciplinary endorsement.

Social Studies. A similar pattern of association between endorsement enrollment and performance is observed for Social Studies. For STEM, Arts & Humanities, and Multidisciplinary endorsements, higher performance in Social Studies is associated with higher participation in these three endorsements. Thus, 37.6%, 17.2%, and 35.4% of the highest achievers enroll in STEM, Arts & Humanities, and Multidisciplinary, respectively. On the contrary, Table 4 shows that for Business & Industry and Public Services, higher performance in Social Studies is associated with lower participation. Only 16.5% and 16.1% of the highest achievers enrolled in Business & Industry and Public Services, respectively, while 29.7% and 26.3% of the poor achievers enrolled in these two endorsements. Similar to the trend for pre-high school reading levels, students with missing information in Grade 8 Social Studies overrepresented in the Multidisciplinary endorsement.

Science. The achievement-endorsement association patterns continue for Grade 8 Science. High science performance is associated with increased participation in STEM, Arts & Humanities, and Multidisciplinary endorsements. Thus, 36.6%, 16.6%, and 32.8% of the highest achievers in science enrolled in STEM, Arts & Humanities, and Multidisciplinary, respectively. On the contrary, Table 4 shows that for Business & Industry and Public Services, higher performance is associated with lower participation, and only 17.5% and 17.2% of the high achievers enrolled in Business & Industry and Public Services, respectively. Meanwhile, these endorsements enrolled 30.5% and 26.7% of students who achieved Level I in science. In addition, 38.7% of students with missing information in Grade 8 STAAR Science are enrolled in the Multidisciplinary endorsement.

Math/Algebra. The achievement-endorsement association patterns previously observed are now very consistent only for the STEM enrollment, with the percentages increasing from 9.7% at Level I to 39.7% at Level V of Math/Algebra achievement. A moderate increase in participation, with slight fluctuations, is also noticeable for the Arts & Humanities and Multidisciplinary endorsements, higher performance being associated with higher participation in these endorsements. On the contrary, Table 4 shows that for Business & Industry and Public Services, higher performance is associated with lower participation. The percentage of Business & Industry enrollment decreased from 31.6% to 15.7% from Level I to Level V Math/Algebra achievement. Similarly, the percentage of Public Services enrollment decreased from 26.3% to 18.4% between Level I to Level V Math/Algebra achievement. Finally, 36.6% of students with missing information in Math/Algebra performance chose the Multidisciplinary endorsement. However, 15.6% of the 'missing data' group enrolled in STEM – a higher enrollment percentage than those from Math/Algebra Level I, which might suggest that missing STAAR information is not always related to low performance.

Discussion

Focusing on the 9th graders in Texas public secondary education, this paper contributes to research on college and career readiness, an essential step toward workforce development, by examining enrollment in the new endorsement program that is anticipated to shape student educational pathways through high school and beyond. As mentioned in the Method section, by restricting the 9th graders cohort to the student population enrolled in school districts that offered all five endorsements in 2015/16, we used endorsement enrollments as a proxy for student choice and intention to explore future career paths. Exploration of careers and preparedness to make future decisions are major goals of the endorsement program, so students should have equal access to this opportunity.

As emphasized by Blume and Zumeta (2014), the attainment of CCR goals requires systemic statewide policy changes in the public school curriculum, so it is commendable that Texas FHSP introduced endorsements to guide students' transition to college and careers. Among other factors, the study investigated the extent to which endorsement choices were related to pre-high-school achievement (Adamuti-Trache & Sweet, 2014; Kao & Thompson, 2003) and participation in CTE (Conley & McGaughi, 2012; Lynch, 2000), key elements in shaping students' academic and career pathways. The study also focused on understanding whether *all* sociodemographic groups and special student populations are equally represented across endorsement pathways as to identify signs of educational stratification (Kao & Thompson, 2003; Labaree, 1997; Lucas, 1999, 2001). Unfortunately, results based on the second year of program implementation reveal an endorsement enrollment mapping dominated by sociodemographic and academic differences that raise equity and inclusion concerns.

Our findings show a clear divide in endorsement choices by academic achievement in Grade 8. The high achievers (i.e., those who received a Level II or higher) in all four subjects (i.e., reading, social studies, science, and math/algebra) are more likely to enroll in STEM; high achievers in reading and social studies also tend to choose Arts & Humanities. However, low achievement in Grade 8 is consistently associated with the more applied-oriented endorsements such as Business & Industry and Public Services, which suggests that the college-career divide may occur during middle school or earlier, and a key difference is academic preparedness (Barnes et al., 2010; Conley & McGaughi, 2012). Similarly, students taking CTE courses are less likely to enroll in Arts & Humanities and Multidisciplinary Studies, and more likely to choose STEM, Business & Industry, and Public Services, areas in which CTE offerings are available.

The study identified the students enrolled in academic-oriented endorsements (e.g., STEM and Arts & Humanities) that reflect a preference toward academic curriculum and college education destinations (Barnes et al., 2010; Becher & Trowler, 2001; Conley, 2007). For instance, males, Asian, high SES, and gifted students are likely to choose the STEM endorsement; female, gifted, and students with no CTE preparation are likely to choose Arts & Humanities. Gender differences in STEM versus Arts endorsements are aligned with course-taking patterns and career interests documented in the literature (Adamuti-Trache & Sweet, 2014; Sadler et al., 2012).

Meanwhile, the rise of CTE courses and integration with some Texas endorsements (i.e., Business & Industry, Public Services and to some extent STEM) reflect the success of the 2006 Carl Perkins Career and Technical Education Act that revitalized vocational education by allocating federal funding for the improvement of both secondary and postsecondary CTE programs across the nation. This response addresses Abrassart and Wolter's (2020) concern that the "image deficit of vocational training" held by students and parents is associated with perceived lower educational requirements

(e.g., average years of education); the authors suggest the expansion of the career programs at the postsecondary level could improve the perceived social prestige of the related occupations. The College and Career Readiness framework (Conley, 2010, 2012) takes an integrative approach to academic and applied (vocational) preparation during high school, without stigmatizing the latter. STEM endorsement curriculum (TEA, 2019a) includes CTE courses, and according to our findings, 16.9% of STEM students took Coherent CTE sequences and 16.6% took some CTE courses. The STEM endorsement is probably the best example of integrating academic and applied preparation during high school.

However, study findings also show that enrollment in Business & Industry is more likely to be the choice of at-risk, economically disadvantaged, and ESL students, while female, Hispanic, African American, and economically disadvantaged students tend to enroll in Public Services. Sociodemographic groups enrolled in the applied-oriented endorsements are most often identified with students underrepresented in 4-year universities. However, their early orientation toward vocational education should not be stigmatized as a demeaning option (Meer, 2005). As discussed by Lynch (2000), CTE in the 21st century high schools should focus on career planning that prepares graduates for both workplace and continuing postsecondary education, thus rejecting the elitist view that "any formal context of education for work is not appropriate for students aspiring to a four-year college or university" (Lynch, 2000, p. 157).

Equity in student counseling and guidance to endorsement pathways matching student interests and potential is important, particularly for minority and low-income students (Cumpton & Giani, 2014; Terry et al., 2015). Successful implementation of the new FHSP requires well-trained counselors who can offer support to traditionally disadvantaged students by adopting strength-based counseling approaches that focus on positive youth development (e.g., Galassi & Akos, 2007). Counselors should also ensure that all students receive unbiased advice as required by the American School Counselor Association ethical standards (ASCA, 2018).

Since endorsements reflect subject-specific preparation sequences that align with a college major or career pathway and ostensibly offer greater student curriculum choice and flexibility, the opportunity to develop one's career interest and skills through early planning and engagement align to principles of social and economic efficiency (Labaree, 1997). The new FHSP program is expected to impact students' long-term achievement and success, as previous research found evidence that early educational planning is positively associated with educational attainment (Callan et al., 2006; Clausen, 1991; Conley, 2010, 2012). Unfortunately, our study showed that not all students participated in the endorsement program at the beginning of their high school education, while some students fall off the track during their transition to high school[10]. These students were more likely to be minority students, LEP/ESL students, special education and at-risk students, and economically disadvantaged for whom the opportunity gaps are systemically widening (Reardon, 2011). Thus, Sikes (2018) asserts that the endorsement plan is not intended for all students to be "college *and* career ready," but "only one or the other to best— or most 'efficiently'—suit the anticipated needs of the Texas economy" (p. 107). As a result, students who cannot take advantage of available instructional opportunities for a variety of reasons are limiting their chance to achieve social mobility through education (Iannelli, 2016).

[10] Students who did not claim an endorsement at 9th grade may still graduate with an endorsement, but will likely experience delays. Even if missing information could be related to data reporting issues, the systemic patterns of cumulative educational disadvantage for some (same) groups should raise social equity concerns.

Research focused on educational equity calls for state accountability policies to improve systems and eliminate inequities in educational opportunities "perpetuated through differential access to a high-quality curriculum that focuses on critical thinking skills and prepares students for college and careers" (Learning Policy Institute, 2017, p. 1). This request aligns with the federal government's emphasis on raising standards for all students (U.S. Department of Education, 2010). Although the endorsement program appears to create an instructional environment that promotes college and career readiness goals in Texas high schools, we question whether the presence of social stratification in the endorsement pathways (i.e., both participation and choice) resembles a form of setting/tracking and should raise equity and inclusion concerns (Labaree, 1997; Lucas, 1999, 2001; Sikes, 2018). The mapping of 9th graders' endorsement enrollment in the FHSP program indicates that the divide between academic-oriented and applied endorsements is marked by differences in student sociodemographic and academic characteristics which is a sign of social stratification that reproduces educational inequality. Therefore, our study identifies disparities in enrollments that limit access to the opportunities inherent in the endorsement policies and may have long term effects on social mobility.

By highlighting the presence of social stratification in endorsement enrollments at the beginning of high school, we only ask whether some form of college and career readiness planning process should start much earlier or more resources should be devoted to its implementation. Our study shows that about 20% of Texas 9th graders may have had limited endorsement choices, so it supports findings of Terry et al.'s (2015) report that identified a complexity of ongoing issues affecting the implementation of FHSP, such as lack of state guidance, lack of counselors, struggle to recruit CTE teachers and industry partners, staffing shortage for popular endorsements, challenge with curriculum sequencing, etc. Although most school districts show satisfaction with the intent of House Bill 5 policy and relevance for increasing students' college and career readiness, school administrators and policymakers should not forget the students who are missing this educational opportunity.

Conclusion

The study findings are valuable to educators and administrators in schools and postsecondary institutions to understand issues of course and assessment alignments in K-16 education, and could support evidence-based decisions on state policy and funding priorities. It could help advisors develop detailed guidelines on endorsement choices for parents and students, and better inform state legislators and other policymakers on developing policies and programs that ensure high school students' preparedness for postsecondary education and the workforce.

The results of this study provide policymakers and school administrators with baseline information on the implementation of FHSP in the State of Texas. However, we acknowledge that only the examination of long-term effects of endorsement choices (e.g., postsecondary participation, choice of field of study or vocational careers, labor market outcomes) through future analysis of Texas 9th graders' pathways could shed light on potential social stratification effects maintained by the endorsement program. Only a longitudinal study on students' actual educational and career pathways could answer the question of whether some endorsements give long-term 'advantage' to students (i.e., depending on the social and economic contexts, and how advantage is measured). This paper is the first in a series of research studies following a cohort of Texas 9th graders as they progress to enter into postsecondary education and the workforce.

In addition, we acknowledge that school- and district-level data should be explicitly included to fully understand the cross-level interactions among student-, school-, and district-level variables. This will help identify any institutional barriers that may add to the systemic academic and social disadvantage experienced by some groups of students while navigating the new FHSP graduation program.

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Appendix

Table A1

Endorsement Data – The 2015/16 Cohort vs. Five-Endorsement-District Population

Population	Missing Endorsement data	FHSP data
2015/16 Cohort (*N*=428,667)	*n*=22,637 (5.3%)	*n*=406,030 (94.7%)
Five-endorsement-district population (*n*=365,041)	*n*=18,229 (5.0%)	*n*=346,072 (95.0%)

Note: The FHSP population of *n*=346,072 students with reported endorsement data is selected from school districts offering all 5 endorsements. Table A1 shows a similar percentage of missing endorsement cases in the 2015/16 cohort and the Five-endorsement-district population.

Table A2

Student Characteristics (%) – The 2015/16 Cohort vs. Five-Endorsement-District FHSP Population

	Cohort *N*=428,667	FHSP *n*=346,072		Cohort *N*=428,667	FHSP *n*=346,072
Female	47.9	48.2	No-CTE	35.2	36.0
Male	52.1	51.8	Some CTE	32.2	32.5
Asian	3.8	4.2	Coherent CTE seq	32.6	31.5
African American	13.0	13.1	Reading-Level I	54.2	54.3
Hispanic	52.3	51.5	Reading-Level II	17.6	18.0
Indigenous People	.5	.5	Reading-Level III	18.8	19.4
Multiracial	1.8	1.8	Reading Missing	9.5	8.4
White	28.6	27.8	Social studies Level I	69.6	69.7
Not-Econ Disadv	43.5	44.4	Social studies Level II	11.7	12.2
Econ Disadv	56.5	55.6	Social studies Level III	9.4	10.0
Non-Immigrants	97.8	97.7	Social studies Missing	9.3	8.1
Immigrants	2.2	2.3	Science Level I	59.9	59.8
NoLEP/NoESL	86.7	86.5	Science Level II	17.1	17.7
LEP/NoESL	3.4	3.6	Science Level III	13.7	14.3
LEP/ESL	9.9	9.9	Science Missing	9.3	8.1
Not-SPED	90.8	91.2	Math/Algebra Level I	51.7	51.3
SPED	9.2	8.8	Math/Algebra Level II	16.8	17.2
Not-GIFTED	91.2	90.6	Math/Algebra Level III	2.7	2.7
GIFTED	8.8	9.4	Math/Algebra Level IV	5.9	6.2
Not At-Risk	45.8	46.7	Math/Algebra Level V	11.6	12.5
At-Risk	54.2	53.3	Math/Algebra Missing	11.2	10.1

Note: Table A2 shows slight differences between the 2015/16 cohort and the FHSP population that has lower percentages of at-risk and economically disadvantaged students, and higher rates of attainment in Grade 8 academic performance.