Texas

HISPANIC-SERVING COMMUNITY COLLEGES
STEM PIPELINES

STEM Degree Attainment at Hispanic-Serving Community Colleges in Texas

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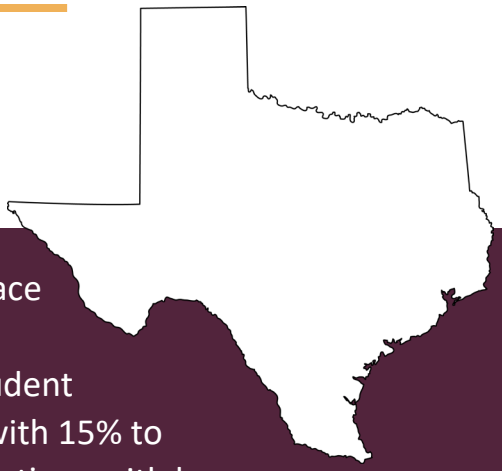

This research brief focuses on STEM degrees conferred in Texas by race and gender at three institutional types: Hispanic-Serving Communty Colleges (HSCCs), which are 2-year institutions with 25% Hispanic student enrollment or more; Emerging HSCCs, which are 2-year institutions with 15% to 24.9% Hispanic student enrollment; and Non-HSCCs, which are institutions with less than 15% Hispanic student enrollment.

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Introduction

The Hispanic-Serving Community Colleges STEM Pipelines (HSCC-STEM) study is a research project that explores the transitions to and through Hispanic-serving two-year institutions for underrepresented minoritized STEM students. The literature largely notes Hispanic-serving institutions (HSIs) as four-year colleges and universities (Garcia, 2018; Núñez, Crisp, & Elizondo, 2016). As the discourse primarily engages four-year-centered and full-time equivalent student enrollment framing of HSIs, this should not be the default given the critical influence of HSIs that are community colleges. Hence, there is intentionality in this project that explicitly references two-year HSIs due to the nuance of minority-serving institutions (MSIs) and in particular minority-serving community college (MSCC) contexts (Fox, Thrill, & Zamani-Gallaher, 2017). Thus, in order to better capture STEM pathways for underrepresented minoritized part-time students, HSCCs are any associate degree-granting postsecondary institutions that have at least 25% enrollment of full- and part-time Latinx students (Zamani-Gallaher, Yeo, Velez, Fox, & Samet, 2019).

This brief uncovers the most viable HSCC STEM pathways for Latinxs and other underrepresented minoritized students as well as which fields they are more likely to persist in, and the promising practices at HSCCs that provide transfer pathways leading to further education—on ramps to STEM baccalaureates. The following information provides a profile outlining STEM degrees conferred by race and gender in three types of institutions: HSCCs, which are institutions with 25% or more Latinx student enrollment; emerging HSCCs, which are institutions with 15% to 24% Latinx student enrollment; and non-HSCCs, which are institutions that have a Latinx enrollment rate of less than 15%.

State Demographics

Given that Texas is a border state, the Latinx demographics has continue to increase over the past four decades. Texas had an estimated population of 26,538,614 in 2015. Out of the total population, 13,367,298 (50.4%) were female and 13,171,316 (49.6%) were men. Relative to Texas demographics by race and ethnicity, the White population was 11,635,757 (43.8%), followed by Latinxs (10,196,367 or 38.4%), Black/African Americans (3,070,821 or 11.6%), and Asian Americans (1,110,772 or 4.2%) (U.S. Census Bureau, 2011-2015). While Texas does not have a racial majority, most of its population is comprised of racially minoritized groups.

In Texas, the projected Latinx population is forecasted to surpass Whites in population in 2022. It is expected that Latinxs and Asians will continue to increase at a faster rate than the White population however, over 20 million people will be of Latinx descent whereas Whites will account for roughly 13.5 million of Texans (Texas Demographics Center, 2019). Moving forward, racially minoritized communities will not only shape higher education in Texas, but the political and economic landscape. Therefore, higher education attainment, especially in STEM, will be important for the continued development of the state's and the U.S. economy.

This material is based upon work supported by the National Science Foundation under grant number 1625918. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Data

This brief draws data from the 2015 Integrated Postsecondary Education Data System (IPEDS). Two-year institutions were selected by using both the IPEDS and the Carnegie classifications. The selection criteria of IPEDS, three categories were chosen: sector, highest degree offered, and institutional category. The subcategories of each section are: 'two-year Public,' 'Private not-for-profit,' and 'Private for-profit' in the sector; 'Associate's degree' under the highest degree offered; and 'Degree-granting, associate's and certificates,' and 'Degree-granting, not primarily baccalaureate or above' in the institutional category.

Based on these criteria, total 1,623 institutions were obtained. In the selection criteria of Carnegie classification 2015 (Basic), one category, Baccalaureate/ Associate's Colleges, was selected. The selected subcategories are 'Associate's dominant,' 'Baccalaureate/Associate's Colleges' and 'Mixed baccalaureate/Associate's.' Subsequently, 403 institutions were drawn and informed by the IPEDS and Carnegie classifications. The data was merged into a master data file and four overlapped institutions were deleted. Considering the high number of HSCCs in Puerto Rico, 23 institutions in Puerto Rico were included in our data while other institutions in the U.S. territory were excluded. Thus, the total 2,022 institutions for this study were obtained. For the descriptive analysis, 1,998 institutions were used from the exclusion of 18 invalid institutions leaving 144 Texas colleges as the focus of this brief. It is important to note this number might be different from the numbers the state of Texas identified as community colleges due to different classification criteria. This study includes institutions that conferred more than 10% of degrees at the baccalaureate level or higher (fewer than 90% associate's degrees), as well as institutions that conferred associate's degrees as the highest degree-level offering.

Postsecondary Context: Texas HSCC Landscape

Table 1 illustrates the landscape of two-year institutions. Per our selection criteria, in 2015, 144 two-year institutions in Texas were drawn in our data. Texas is home to 96 HSCCs, which represents 21.3% of all HSCCs across the U.S. and Puerto Rico. Within Texas, HSCCs account for 66.6% of institutions, followed by emerging HSCCs (22.2%) and non-HSCCs (11.1%).

Over the past three decades, there has been a significant increase nationally in private for-profit institutions (Deming, Goldin, & Katz, 2012). In our data, a similar proportion of institutional control was shown nationally. A growing number of private for-profit institutions privately controlled not-for-profit institutions are reflected in Texas data as well. Out of the 144 institutions in Texas, 69 (47.9%) institutions were private for-profit institutions. There were 12 (8.3%) private not-for-profit institutions. Out of 96 institutions of HSCCs, 50 (52.0%) were private for-profit institutions, 38 (39.5%) were public institutions, and 8 (8.3%) were private not-for-profit.

Control of institution	Eligibility of HSCCs 2015 in Texas			
	Non-HSCCs Count	HSCCs Count	Emerging HSCCs Count	Total
Public	7	38	18	63
Private not-for-profit	2	8	2	12
Private for-profit	7	50	12	69
Total Institutions	**16**	**96**	**32**	**144**

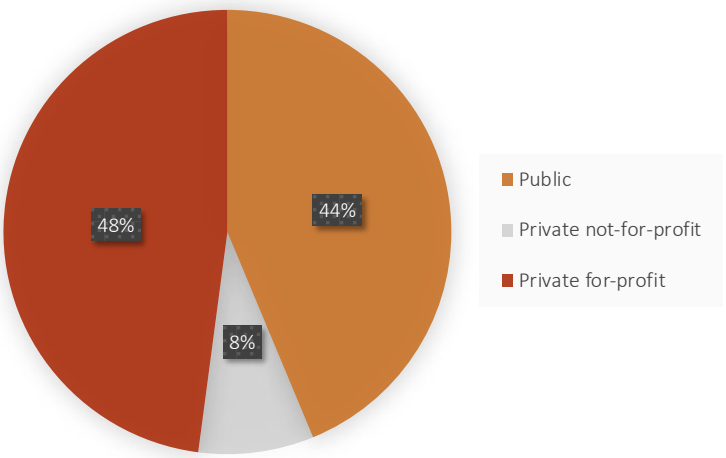


Figure 1-1. Community colleges by control of institution in Texas

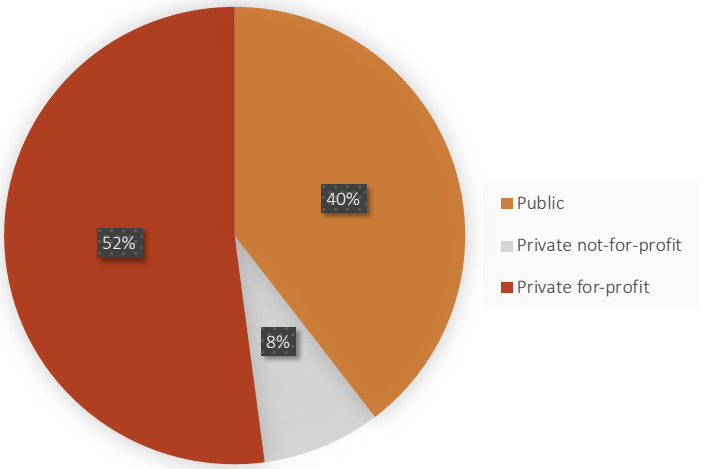


Figure 1-2. HSCCs by control of institution in Texas

Minority-Serving Institution Status

Given that California is a majority-minority state, in which people of color comprise most of the population, many higher education institutions may hold multiple Minority-Serving Institution (MSI) designations. MSIs are often located in low-income areas and enroll underrepresented students of color and are therefore essential in providing access to postsecondary opportunities and broadening participation (Harmon, 2012; Nguyen, Lundy-Wagner, Samayoa, & Gasman, 2015).

In our project, the MSI status was used to see whether there were other federal designations cross-listed with the HSI designation. We used the federal government designations for Asian-American and Native American Pacific Islander-serving institutions (AANAPISIs) and predominantly Black institutions (PBIs). AANAPISIs have at least 10% of Asian- American and Native American Pacific Islander student enrollment, while PBIs have at least 40% of African-American or Black student enrollment (U.S. Department of Education, 2017).

Table 2 shows the MSI designations by HSCC eligibility. In California, 73 institutions were designated as AANAPI-SIs and two as PBIs out of the 206 two-year institutions. Basically, one out of every three community colleges in California are AANAPISIs, which are known for enrolling the bulk of low-income Asian-American and Pacific Islander students (Teranishi, 2011). Out of the 156 HSCCs, 53 were identified as AANAPISIs, which means that over 33% of HSCCs are also AANAPISIs.

Furthermore, out of the 73 AANAPISIs in California, 53 were identified as HSCCs, which indicates that 72% of AN-NAPISIs are also HSCCs. There was only one PBI cross-listed as an HSCC. The important information to note here is that institutions of higher learning, especially those enrolling a high proportion of low-income students and students of color are essential for the access and success of minoritized students. Given the history of two-year institutions providing access and opportunity for marginalized populations, they will continue to play a crucial role in credential attainment, especially when it comes to the transfer function.

HSCCs are cross-listed with other MSI designations such as AANAPISIs and PBIs. There were seven ANNAPISIs and 20 PBIs in 2015. Among them, two institutions, Interactive College of Technology and Houston Internation-al College Cardiotech Ultrasound School, were designated as ANNAPISI and PBI in our data. Interestingly, insti-tutions that were designated as PBIs were all private for-profit except Cedar Valley College. Table 3 describes the list of MSI status of HSCCs and Emerging HSCCs in Texas. There are no Tribal Colleges in Texas. If the demo-graphic continues to shift as expected, we will see two-year colleges with multiple federal designations.

Table 2. Numbers of Minority-Serving Institutions Cross-listed with HSCCs in Texas in 2015

HSCCs Eligibility	AANAPISIs Eligibility	PBIs Eligibility		Total
		Non-PBIs	PBIs	
Non-HSCCs	Non-AANAPISIs	12	4	16
	AANAPISIs	0	0	0
	Total	**12**	**4**	**16**
HSCCs	Non-AANAPISIs	81	9	90
	AANAPISIs	5	1	6
	Total	**86**	**10**	**96**
Emerging HSCCs	Non-AANAPISIs	25	5	30
	AANAPISIs	0	1	1
	Total	25	6	31
Texas Total	Non-AANAPISIs	118	18	136
	AANAPISIs	5	2	7
	Total	**123**	**20**	**143**

Note. One institution was invalid resulting in a total of 143 institutions in this table.

HSCC Student Demographics

In this section, the student demographics are described based on 12-month enrollment with an unduplicated headcount and degrees/awards conferred drawn from IPEDS. In 2015, there were total of 1,144,519 students enrolled in two-year institutions in Texas. About 96% of students enrolled in HSCCs. Specifically, 75.3% (862,530) of students enrolled in HSCCs and 21.04% (240,779) enrolled in emerging HSCCs. The Hispanic/Latinx student population is larger than the White student population. Latinxs were 37.4% (428,686) out of the total enrollment, followed by Whites (35.4% or 405,606), Black/African Americans (15.7% or 180,030), and Asian (4.7% or 54,483). Given the demographic projections in Texas, the number of White students will continue to stay steady, while students from racially minoritized backgrounds is forecasted to exponentially increase in the next three decades.

Out of the total students enrolled, 43% (488,024) were men and 57% (656,495) were women. In general, women's enrollment was slightly higher than men across racial groups (See Figure 2-2). Latinx women make up 23% of the student enrollment in Texas, making up almost a quarter of all students, followed by White women (21%). In Texas, women are enrolling in college at higher rates than men.

In Texas, community colleges awarded a total of 77,406 degrees in 2015 Latinxs earned a total of 29,551 (38.1%) degrees, followed by Whites (29,289 or 37.8%), Black/African Americans (10,017 or 12.9%), and Asians (3,440 or 4.4%). Out of the total degrees conferred in 2015, 60% (46,518) degrees were awarded to women and 40% (30,888) degrees to men. In examining enrollment by race and gender demographics, in general, the degrees conferred by Latinx were slightly higher than Whites, and women were earned more degrees than men. Given that Latinx student enrollment is 40%, more efforts are needed to ensure Latinxs are graduating at similar rates as their population. Across institutional types, HSCCs granted 57,021 (73.6%) degrees, followed by emerging HSCCs (16,730 or 21.6%), and non-HSCCs (3,655 or 4.7%). Given that HSCCs are 66.6% of postsecondary institutions, they conferred 73.6% of the degrees in Texas.

Table 3. Minority-Serving Institutions in Texas

HSCCs Eligibility	#	Institution (entity) name	Sector of institution	AANAPISIs	PBI
HSCCs	1	Brookhaven College	Public, 2-year	AANAPISIs	Non-PBIs
	2	Houston Community College	Public, 2-year	AANAPISIs	Non-PBIs
	3	North Lake College	Public, 2-year	AANAPISIs	Non-PBIs
	4	Richland College	Public, 2-year	AANAPISIs	Non-PBIs
	5	Wharton County Junior College	Public, 2-year	AANAPISIs	Non-PBIs
	6	Interactive College of Technology	Private for-profit, 2-year	AANAPISIs	PBIs
	7	ITT Technical Institute-Houston West	Private for-profit, 4-year or above	Non-AANAPISIs	PBIs
	8	Remington College-Houston Campus	Private not-for-profit, 2-year	Non-AANAPISIs	PBIs
	9	Fortis College-Houston	Private for-profit, 2-year	Non-AANAPISIs	PBIs
	10	Concorde Career College-Grand Prairie	Private for-profit, 2-year	Non-AANAPISIs	PBIs
	11	Everest College-Dallas	Private not-for-profit, 2-year	Non-AANAPISIs	PBIs
	12	Everest College-Arlington	Private for-profit, 2-year	Non-AANAPISIs	PBIs
	13	Remington College-North Houston Campus	Private not-for-profit, 2-year	Non-AANAPISIs	PBIs
	14	Fortis College-Grand Prairie	Private for-profit, 2-year	Non-AANAPISIs	PBIs
	15	The College of Health Care Professions-Dallas	Private for-profit, 2-year	Non-AANAPISIs	PBIs
Emerging HSCCs	1	Houston International College Cardiotech Ultrasound School	Private for-profit, 2-year	AANAPISIs	PBIs
	2	Cedar Valley College	Public, 2-year	Non-AANAPISIs	PBIs
	3	Peloton College	Private for-profit, 2-year	Non-AANAPISIs	PBIs
	4	ITT Technical Institute-DeSoto	Private for-profit, 4-year or above	Non-AANAPISIs	PBIs
	5	Concorde Career College-Dallas	Private for-profit, 2-year	Non-AANAPISIs	PBIs
	6	Brown Mackie College-Dallas	Private for-profit, 4-year or above	Non-AANAPISIs	PBIs

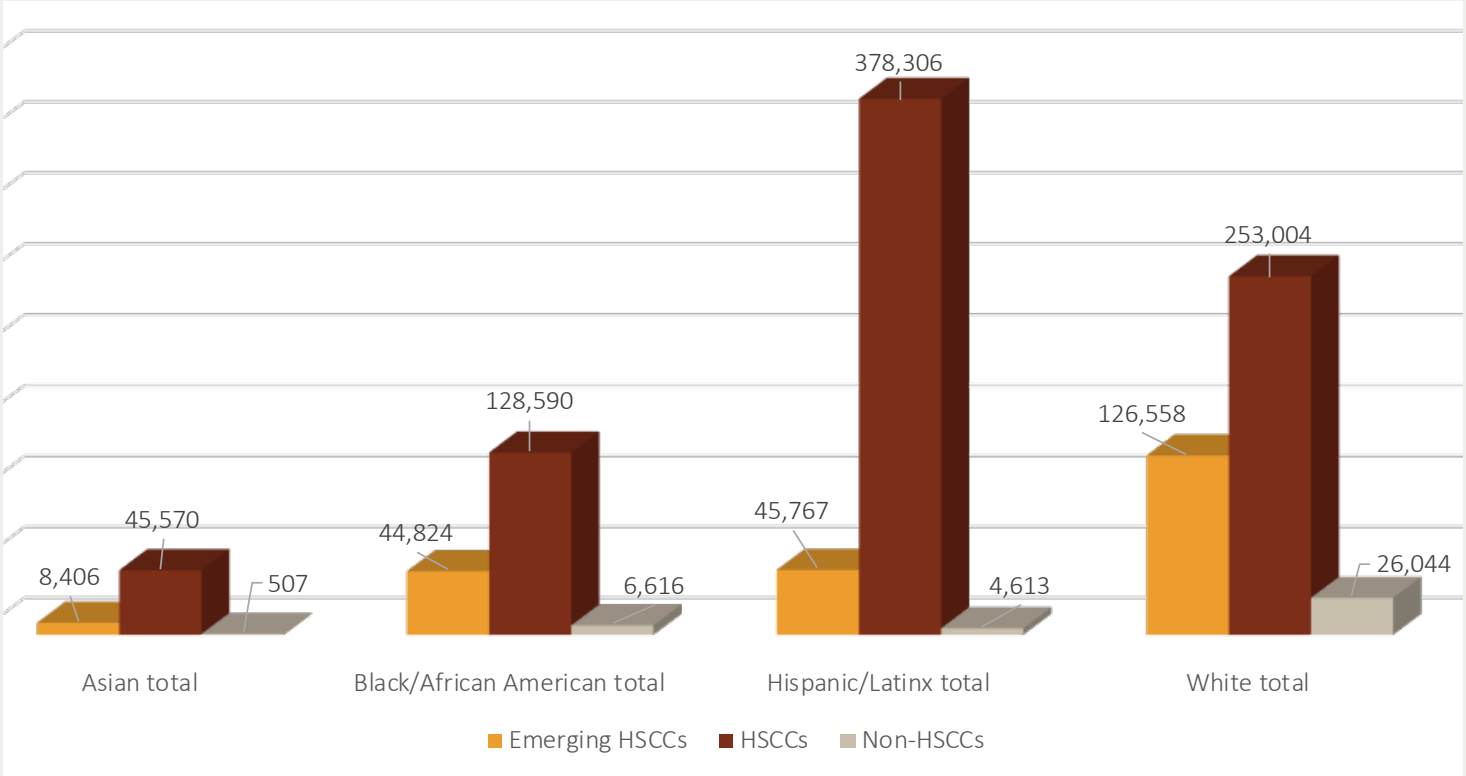


Figure 2-1. 2015 Student racial demographics based on 12-month enrollment by institutional type in Texas

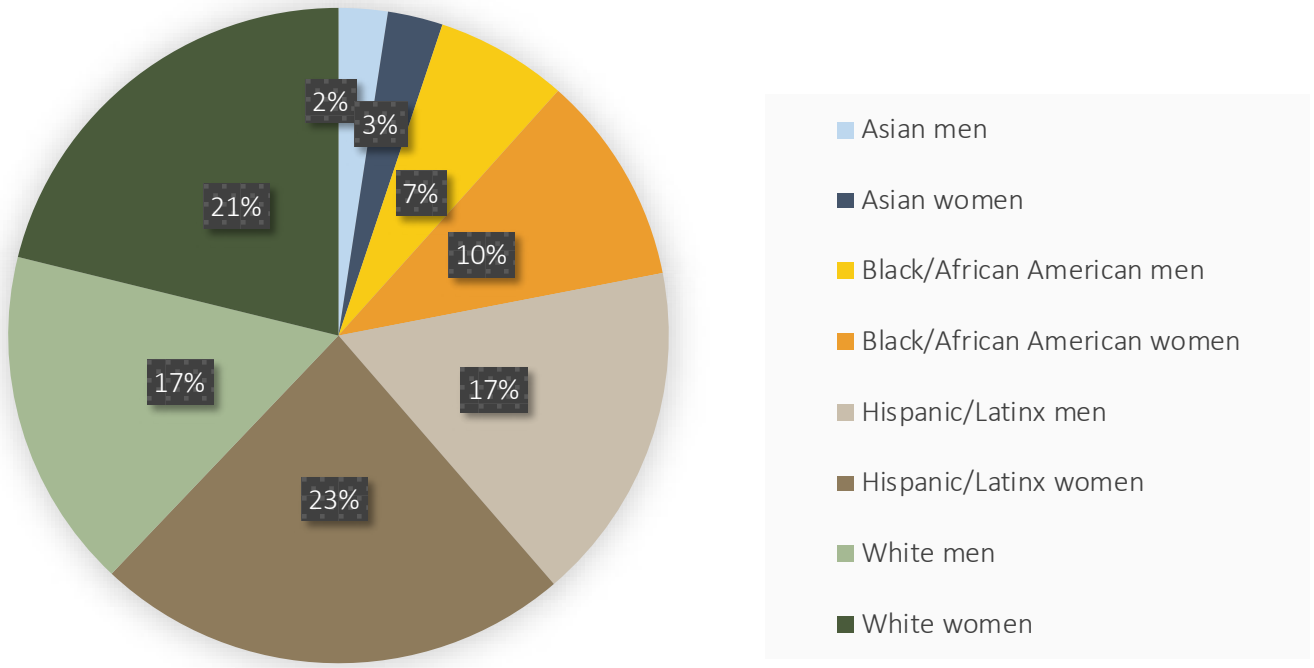


Figure 2-2. 2015 Student enrollment by gender and race in Texas

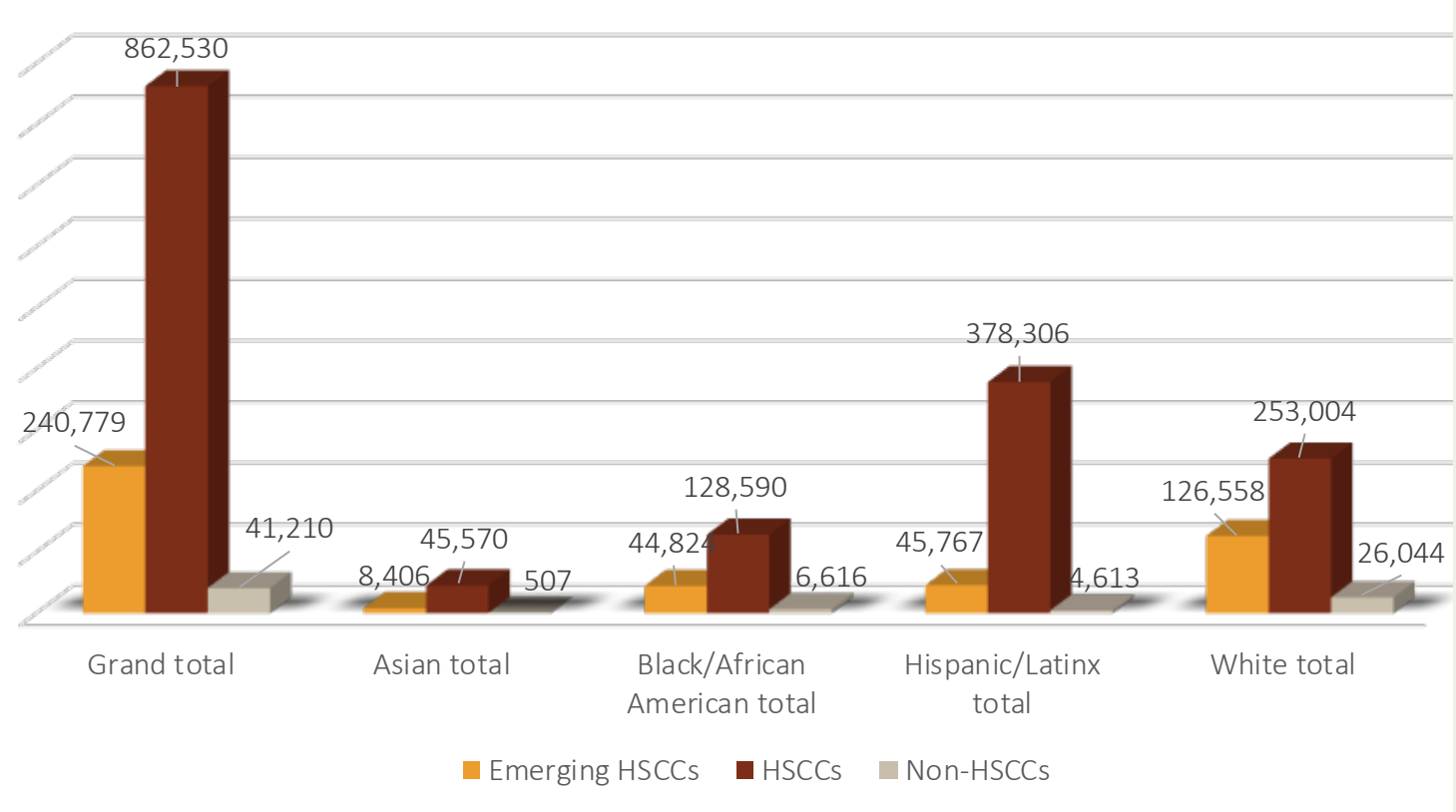
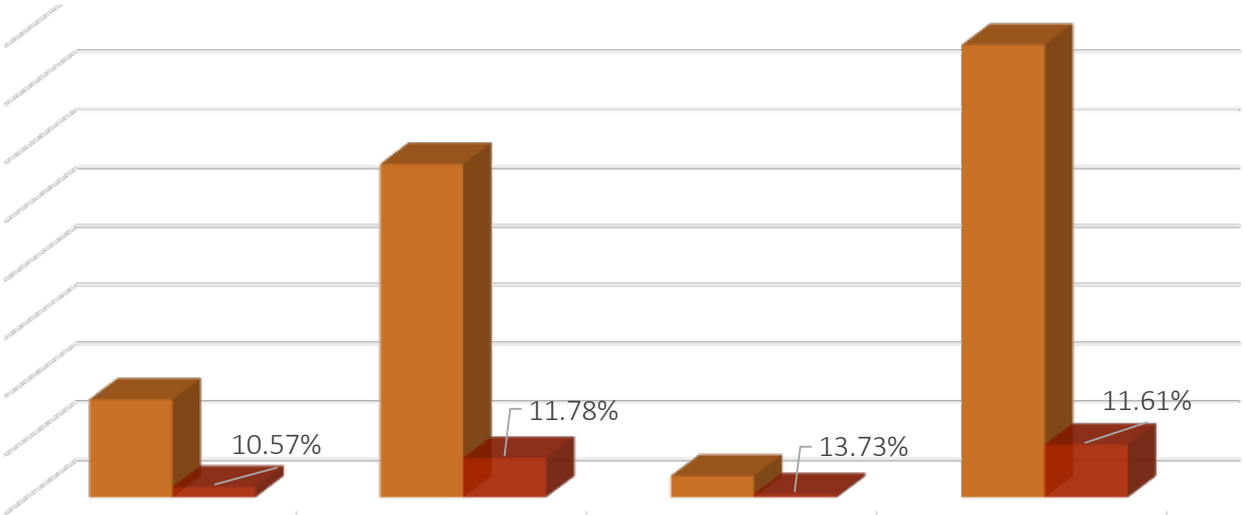


Figure 3. 2015 First major total associate degrees conferred by race and institutional type in Texas

Racial/Ethnic and Gender Participation in STEM

Science, Technology, Engineering and Mathematics (STEM) programs were classified using the NSF Classification of Instructional Program (CIP) Code Crosswalk for STEM disciplines (Louis Stokes Alliances for Minority Participation, 2018). By following the NSF LSAMP STEM category, STEM programs were aggregated into 11 STEM fields: Agricultural Sciences, Natural Resources and Conversation, Architecture, Computer and Information Sciences, Engineering, Engineering Technologies, Biological Sciences, Mathematics, Interdisciplinary Studies, Physical Sciences, and Business and Management.

In Texas, community colleges conferred 8,987 STEM degrees in 2015, which accounted for 11.61% of the total degrees awarded in the State of Texas (see Figure 4-1). Among 8,987 STEM degrees, 94.4% (8,485) degrees was awarded at HSCCs and 58.5% (5,263) degrees went to students of color (see figure 4-2). Specifically, Whites earned 3,724 (41.4%) STEM degrees, followed by Latinxs (3,253 or 36.2%), Black/African Americans (1,127 or 12.5%), and Asians (347 or 3.8%). Within the number of STEM degrees, women earned only 27.5% (2,477) STEM degrees, while men earned 72.4% (6,510) of STEM degrees conferred (see figure 4-3).



	Emerging HSCCs	HSCCs	Non-HSCCs	Total
Grand Total	16,730	57,021	3,655	77,406
STEM Total	1,768	6,717	502	8,987

Figure 4-1. 2015 Total and STEM degrees conferred by institutional types in Texas

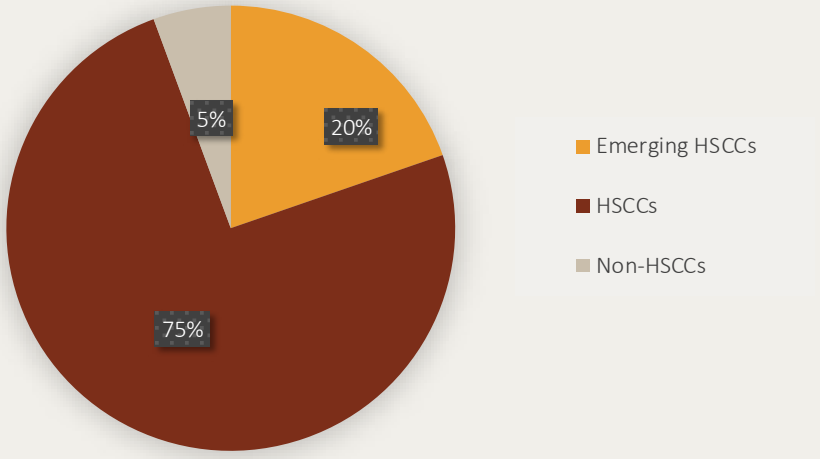


Figure 4-2. 2015 STEM degrees conferred by institutional types in Texas

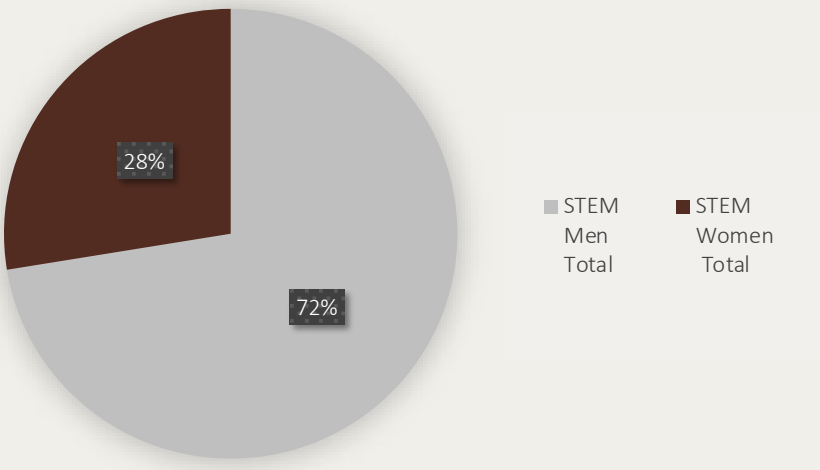


Figure 4-3. 2015 STEM degrees conferred by gender in Texas

HSCCs

HSCCs awarded 57,021 (73.6%) of the total degrees conferred in the State of Texas. Latinxs earned 26,147 (45.8%) degrees in HSCCs, followed by Whites (17,668 or 30.9%) Black/African Americans (6,599 or 11.5%), and Asians (2,890 or 5.0%). Out of the total degrees awarded at HSCCs, men were conferred 22,669 (39.7%) and women were conferred 34,352 (60.2%) degrees. STEM degrees conferred accounted for 11.78% (6,717) out of the total degrees awarded at HSCCs. Of the STEM degrees conferred by HSCCs in 2015, Latinxs earned 2,889 (43.0%), followed by Whites (2,414 or 35.9%), Black/African Americans (742 or 11.0%), and Asians (283 or 4.2%). Out of the STEM degrees conferred by HSCCs, men were conferred 4,834 (71.9%) and women were conferred 1,883 (28.0%) STEM degrees.

Emerging HSCCs

Emerging HSCCs awarded 16,730 (21.6%) of the total degrees conferred in the State of Texas. Whites earned 9,185 (54.9%) degrees in emerging HSCCs, followed by Latinxs (2,997 or 17.9%), Black/African Americans (2,997or 17.9%), and Asians (496 or 2.9%). Out of the total degrees awarded at emerging HSCCs, men were conferred 6,836 (59.1%) and women were conferred 9,894 (40.8%) degrees. In STEM degrees conferred, emerging HSCCs awarded 1,768 (10.5%). Whites earned 959 (54.2%) STEM degrees, followed by Black/African Americans (323 or 18.2%), Latinxs (320 or 18.1%), and Asians (54 or 3.05%). Out of the STEM degrees conferred by emerging HSCCs, men were conferred 1,289 (72.9%)and women were conferred 479(27.0%) STEM degrees.

Non-HSCCs

Non-HSCCs awarded 3,655 (4.72%) of the total degrees conferred in the State of Texas. Whites earned 2,436 (66.6%) degrees in non-HSCCs, followed by Black/African Americans(421 or 11.5%), Latinxs (407 or 11.1%), and Asians (54 or 1.4%). Out of the total degrees awarded at non-HSCCs, men were conferred 1,383 (37.8%) and women were conferred 2,272 (62.1%) degrees. In STEM degrees conferred, non-HSCCs awarded 502 (13.7%). Whites earned 351 (69.9%) STEM degrees, followed by Black/African Americans (62 or 12.3%), Latinxs (44 or 8.7%), and Asians (10 or 1.9%). Out of the STEM degrees conferred by non-HSCCs, men were conferred 387 (77.0%) and women were conferred 115 (22.9%) STEM degrees.

Underrepresentation in Top Three STEM Fields

In the state of Texas, there was a total of 8,987 STEM associate degrees awarded in 2015. Within that number of STEM degrees, there were 6,510 (72.4%) received by men and 2,477 (27.5%) degrees received by women. Overall, the top three STEM fields in Texas were Engineering Technologies (2,964 or 32.9%), Computer and Information Sciences (2,453 or 27.2%), and Biological Sciences (1,026 or 11.4%). In general, there were substantial disparities for gender and race in the top contributing STEM fields, except Biological Sciences. Combine, these STEM fields account for 71.6% of the STEM degrees conferred in the State of Texas.

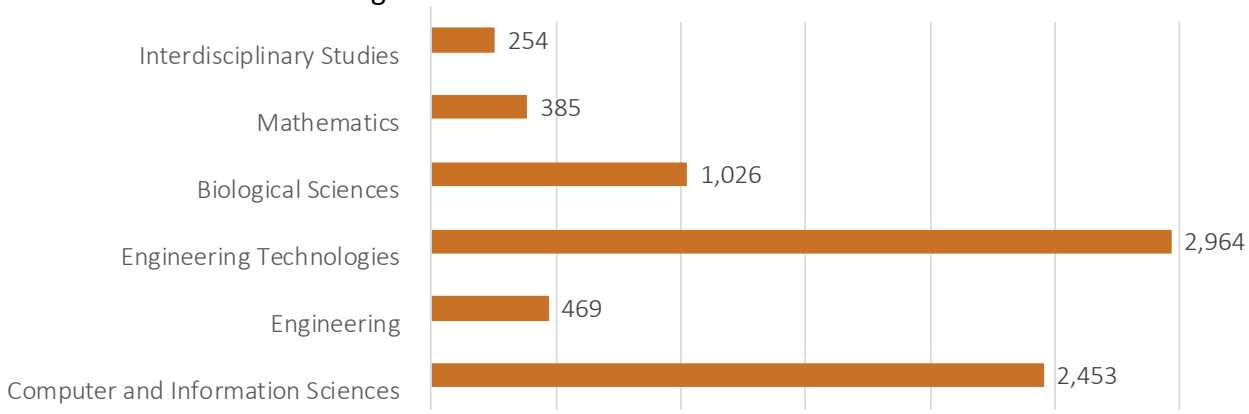


Figure 5. Top contributing STEM fields in Texas

Engineering Technologies

In 2015, 92.5% out of the total 2,964 degrees in engineering technologies were awarded in HSCCs. Specifically, HSCCs awarded 2,294 (77.4%) degrees of engineering technologies, followed by emerging HSCCs (450 or 15.1%) and non-HSCCs (220 or 7.4%). Whites earned 1,304 (43.9%) engineering technologies degrees, followed by Latinxs (986 or 33.2%), Black/African Americans (416 or 14.0%), and Asians (101 or 3.4%). Men were conferred 2,479 (83.6%) and women were conferred 485 (16.3%). Such gender gap in engineering technologies showed across racial groups. Specifically, there were 1,109 White men and 195 White women, 831 Latinx men and 155 Latinx women, 342 Black American men and 74 Black American women and 82 Asian men and 19 Asian Women receiving degrees.

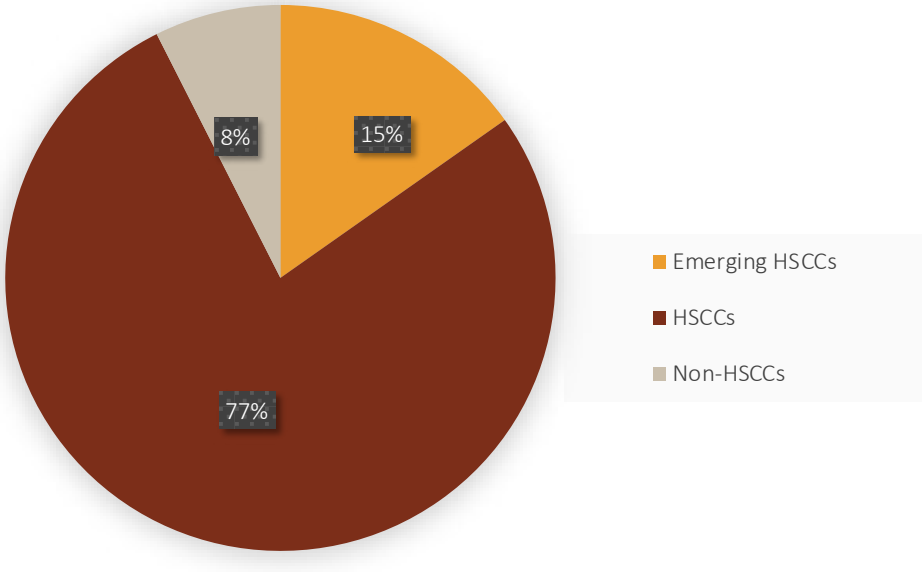


Figure 6-1. Engineering Technologies degrees conferred by institutional type in Texas

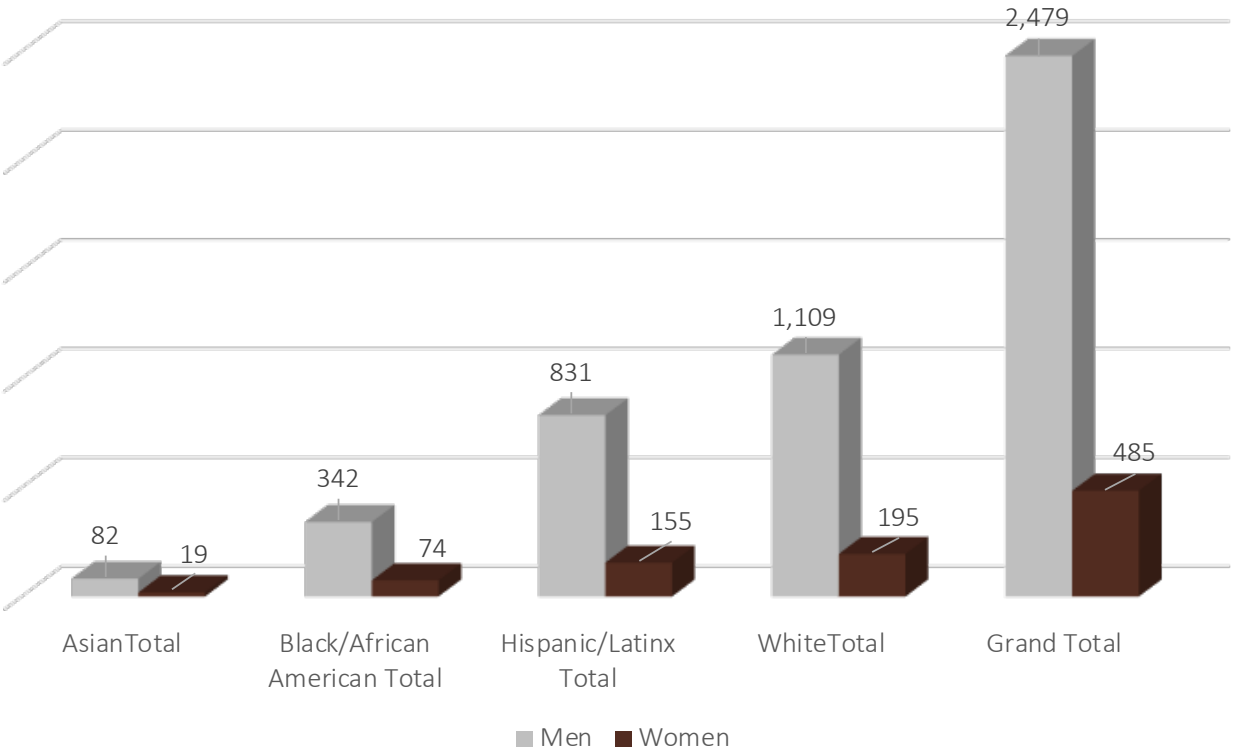


Figure 6-2. Engineering Technologies degrees conferred by race and gender in Texas

Computer and Informational Sciences

Out of the 2,964 computer and information sciences degrees conferred in Texas, HSCCs awarder 1,824 (74.3%) followed by emerging HSCCs (563 or 22.9%) and non-HSCCs (66 or 2.6%). Whites earned 1,007 (41.0%) STEM degrees, followed by Latinxs (809 or 32.9%), Black/African Americans (359 or 14.6%), and Asians (95 or 3.8%). Men were conferred 1,968 (80.2%) and women were conferred 485 (19.7%) STEM degrees. Specifically, there were 818 White men and 189 White women, 665 Latinx men and 144 Latinx women, 268 Black/African American men and 91 Black/African American women, and 77 Asian men and 18 Asian Women receiving degrees.

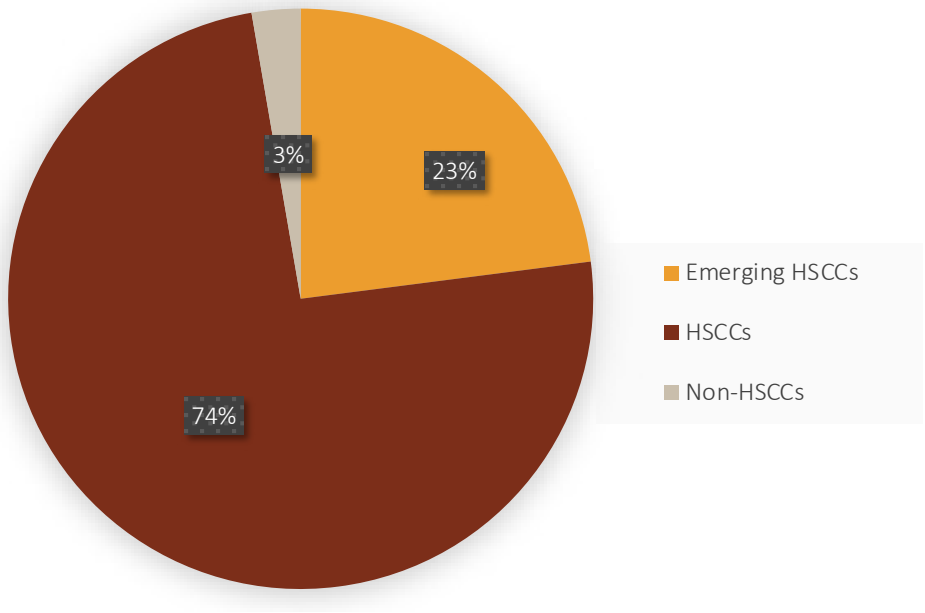


Figure 7-1. Computer Information Sciences degrees conferred by institutional type in Texas

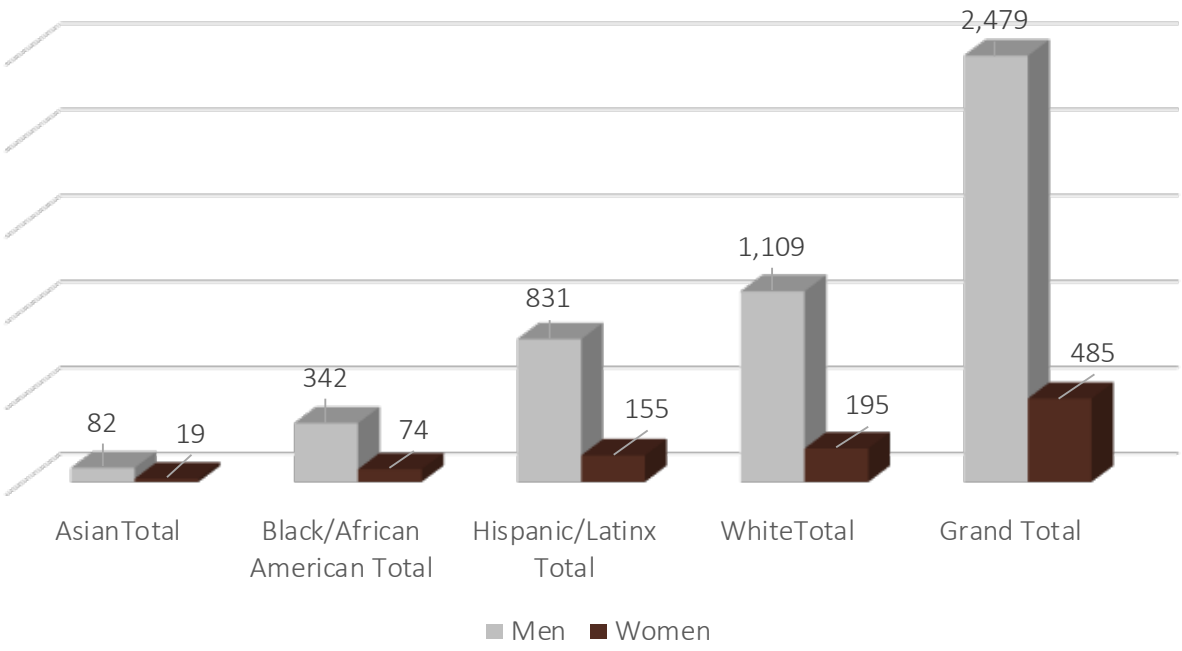


Figure 7-2. Computer Information Sciences degrees conferred by race and gender in Texas

Biological Sciences

Out of the total 1,026 degrees awarded in biological sciences in Texas, HSCCs awarded 821 (80.0%), followed by emerging HSCCs (163 or 15.8%) and non-HSCCs (42 or 4.0%). The field of biological sciences in Texas showed a different landscape when it comes to race and gender. Unlike other STEM fields where Whites and men are generally dominant, 601 (58.5%) 601 of the biological sciences degrees were awarded to Latinxs in Texas. Whites earned 295 (28.7%) STEM degrees, followed by Black/African Americans (63 or 6.1%), and Asians (34 or 3.3%). In terms of gender, 71.44% of degrees were earned by women: Women were conferred 733 and men were conferred 293 degrees in biological sciences. Specifically, there were 427 Latinx women and 174 Latinx men, 216 White women and 79 White men, 46 Black/African American women and 17 Black/African American men, 20 Asian women and 14 Asian men, receiving degrees.

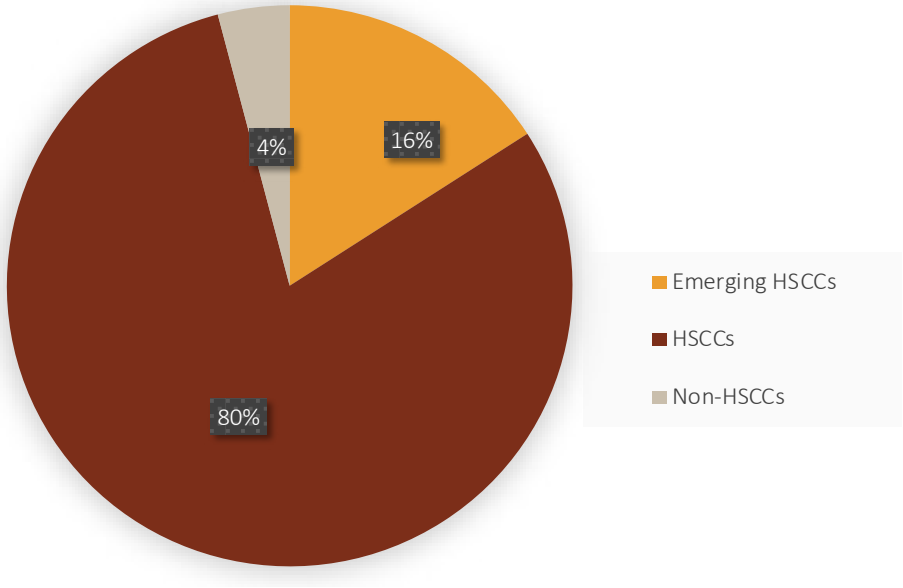


Figure 8-1. Biological Sciences degrees conferred by institutional type in Texas

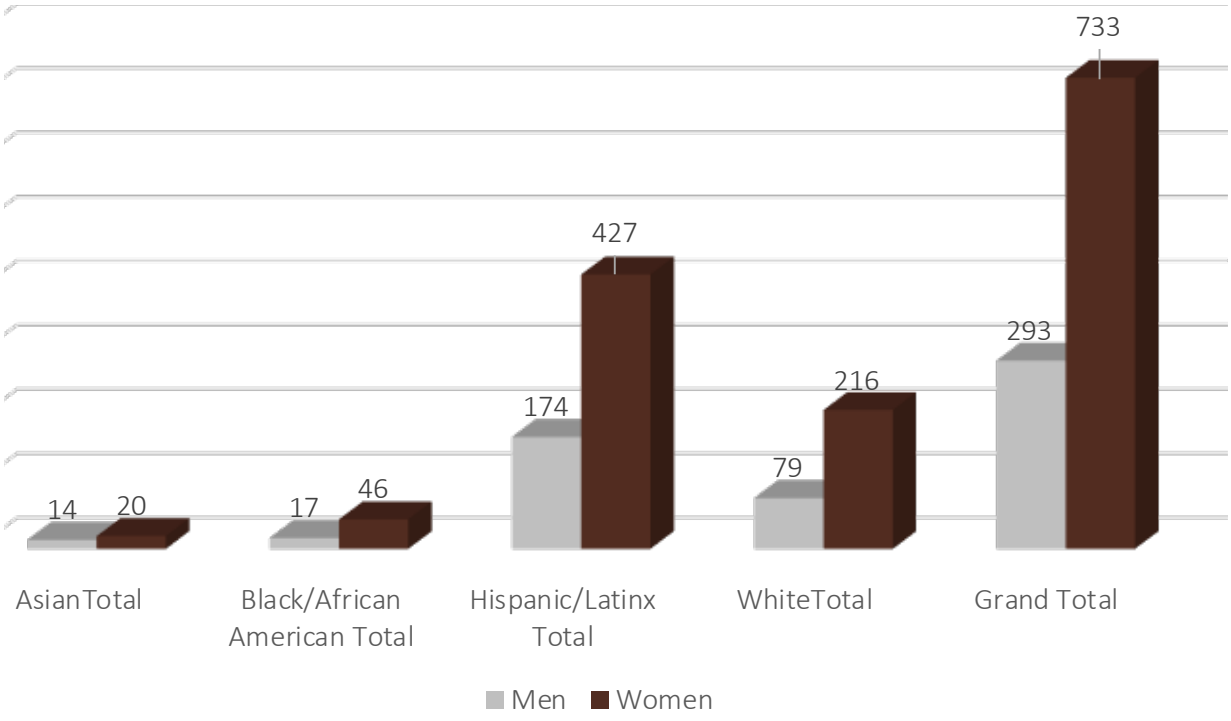


Figure 8-2. Biological Sciences degrees conferred by race and gender in Texas

Summary

In summary, two-thirds of two-year institutions in 2015 were designated as Hispanic Serving Institutions in Texas. Considering the large population of Latinxs, the enrollment and degrees conferred rates of Latinxs as were not surprising.

- HSCCs awarded around 62% of their conferred degrees to students of color (figure 10). Furthermore, HSCCs and emerging HSCCs accounted for almost 96% of the total degrees awarded in Texas
- About 95% of STEM degrees awarded at HSCCs and 62% out of the total STEM degrees at HSCCs were awarded to students of color
- About 70% of the degrees in biological sciences were awarded to students of color and two-thirds were earned by women
- In general, women continue to disproportionately underrepresented within the STEM fields, only receiving 27% of the STEM degrees conferred, despite earning over 60% of the total degrees awarded in the State of Texas

Given that HSCCs awarded more than 75% of the total degrees and 95% of the STEM degrees, they continue to increase access and opportunity to students of color, especially Latinx students and women of color. In the future, these institutional types will continue to play a significant role in the attainment of STEM degrees by students of color.

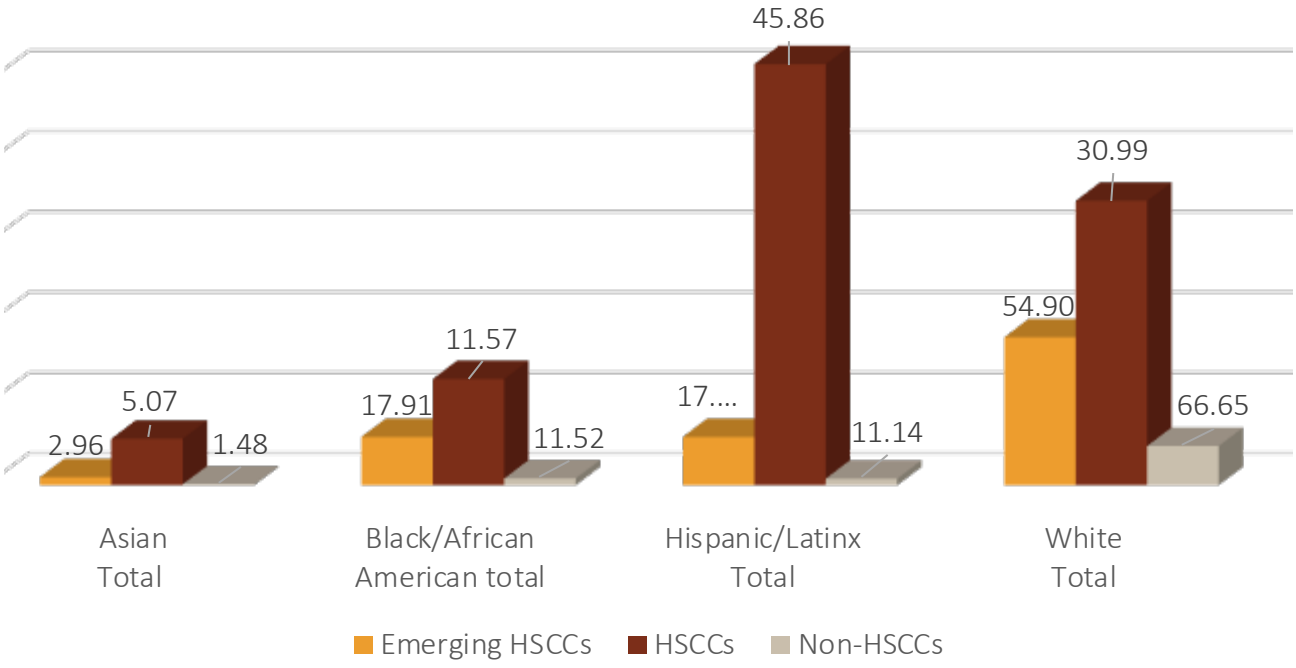


Figure 9. 2015 First major total associate degrees conferred (%) by race and institutional type in Texas

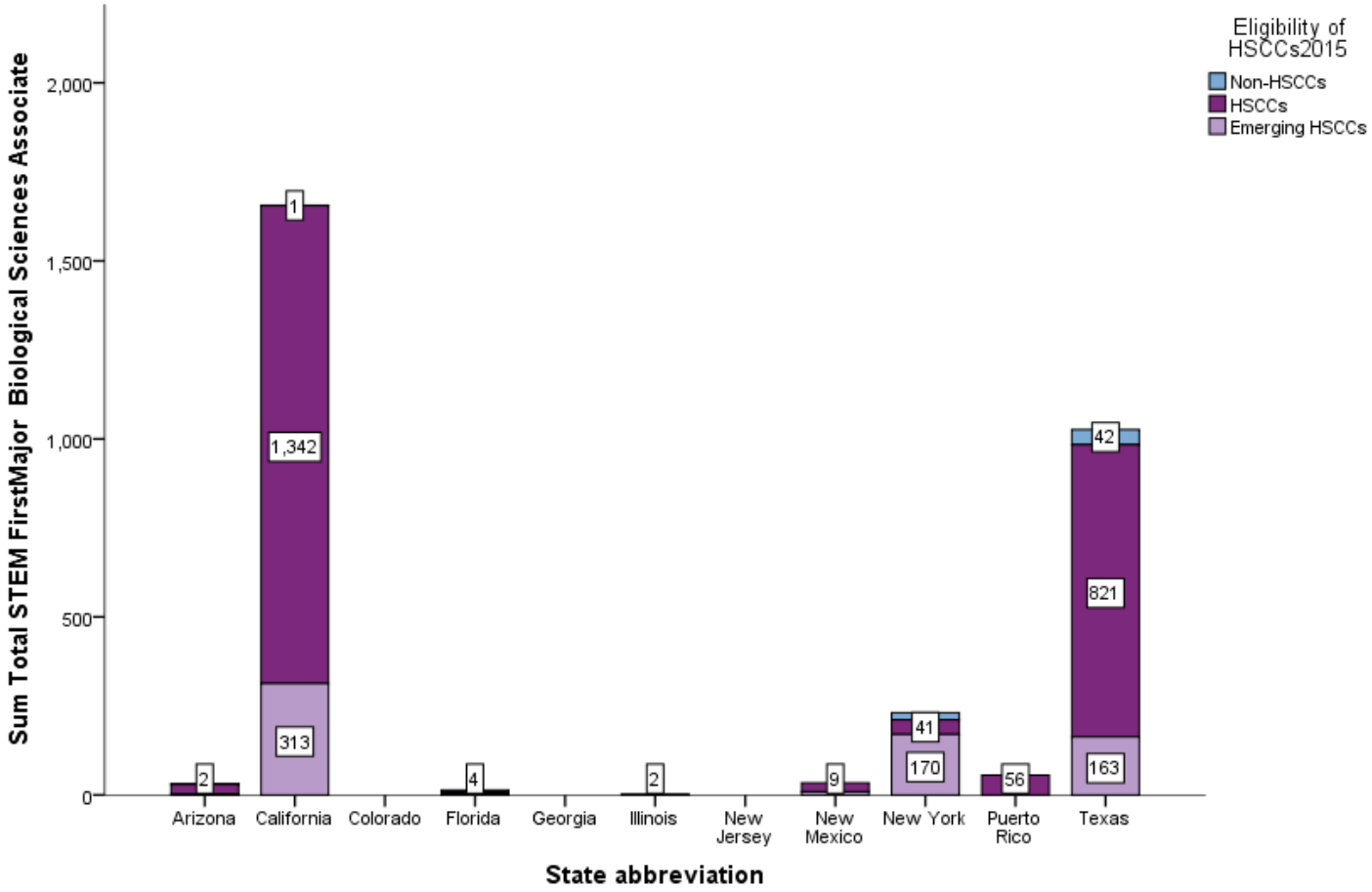


Figure 10. 2015 STEM First major associate degrees conferred (%) by race and institutional type in Texas

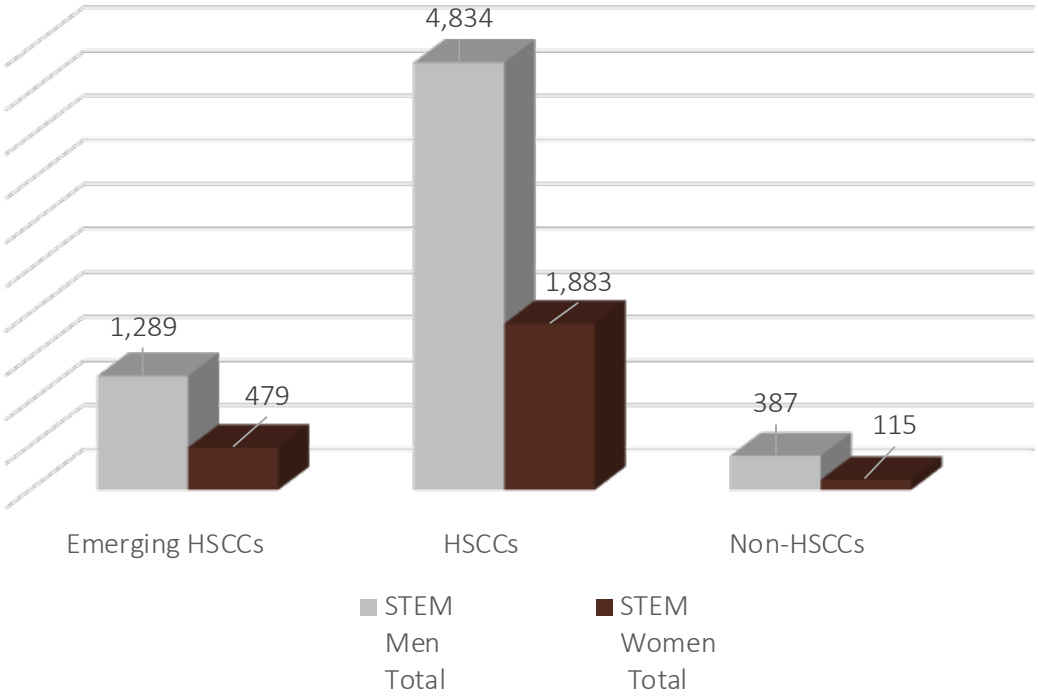


Figure 12. 2015 STEM First major associate degrees conferred by gender and institutional type in Texas

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Notes.

1. Racial/ethnic categories in the data followed the IPEDS categories using their data collection and reports. The groups used to categorize are as follows: Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, Hispanic, White, two or more races, race/ethnicity unknown, nonresident alien. Among these, this research focused on four groups, Blacks or African Americans, Asian Americans, Hispanic Americans or Latinx, White Americans. In addition, this research intentionally identified Black/African American and Hispanic as Latinx (i.e., gender nonconforming) and all groups included in this analysis to reflect domestic racial/ethnic diversity not international student enrollments.

2. The percentage of racial/ethnic groups on the figures and texts are not added up to 100% due to the exclusion of other racial/ethnic groups.

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