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FULL REPORT:

Measurable Education Achievements for Different Populations in Pennsylvania

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Abstract

This study sought to highlight the various post-secondary pathways and outcomes of different student groups in Pennsylvania (PA). These pathways are a particularly relevant area of study, as today's post-secondary students are choosing various pathways to achieve their desired outcomes and were also affected by the Covid-19 pandemic, potentially affecting rates of persistence, enrollment (National Student Clearinghouse, 2021) and vertical transfers (Causey et al., 2022). Additionally, previous literature indicates that different student groups often have different post-secondary outcomes (McFarland et al., 2019; National Center for Education Statistics, 2022a; Shapiro et al., 2017, Velez et al., 2019). Overall, this study presents descriptive findings for four cohorts of PA high school graduates (2014-2017) to examine some pathways to degree attainment. The vast majority of post-secondary degree earners in this study earned a bachelor's degree or above as their highest degree by December of 2021. Further, about a third of 2-year institution graduates in each cohort initiated a vertical transfer by subsequently enrolling in a 4-year institution. Low percentages of all cohorts completed a vertical transfer by December of 2021 (9-26%), but 2-year institution graduates in the earlier cohorts (2014 and 2015) had the highest rates of subsequently graduating from a 4-year institution. Although this study highlighted various differences in post-secondary outcomes for different student groups in PA, future research should continue to examine the post-secondary pathways of recent high school graduates in the current landscape of higher education.



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The Pennsylvania Department of Education (PDE) Evaluation and Research project is an effort that was established through a State Longitudinal Data System (SLDS) Grant from the Institute of Education Sciences (IES), National Center for Education Statistics (NCES), awarded in October 2015. The Research and Evaluation project is an initiative to make full use of the P-16+ system data and other data sources to answer priority questions from the PDE research agenda, to form collaborative research partnerships, and to increase PDE's capacity to conduct research. Our mission is to evaluate and analyze data to provide insight that can be used to positively impact policy, inform decision making and lead to improved student outcomes.

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For more information on PDE's state-level Research Agenda, visit
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KEY FINDINGS:

Degree Attainment by December of 2021

- The majority of post-secondary graduates in each cohort had earned a single credential.
- At least 84% of post-secondary graduates in each cohort earned a bachelor's or above as their highest degree.
- Compared to males, female post-secondary graduates in each cohort had slightly higher rates of earning a bachelor's degree or above as their highest degree (86–88%).
- Although the majority of previously Special Education Status and Economic Disadvantaged Status post-secondary graduates in each cohort earned a bachelor's degree or above as their highest degree, compared to their counterparts, the rates were much lower.
- About half of previously EL Status post-secondary graduates in the 2014–2016 cohorts earned a bachelor's degree or above as their highest degree earned.
- More than half of previously EL Status post-secondary graduates in the 2017 cohort earned an associate's degree as their highest degree earned.
- At least 90% of Asian post-secondary graduates in each cohort earned a bachelor's degree or above as their highest degree.
- Although the majority of Hispanic and Black or African American post-secondary graduates in each cohort earned a bachelor's degree or above as their highest degree (65–73% and 75–81%, respectively), compared to other racial/ethnic groups, these graduates consistently had the lowest rates.
- A majority of post-secondary graduates earned a bachelor's degree or above as their highest degree by December of 2021, regardless of geographic region.
- Post-secondary graduates from suburban high schools consistently had the highest rates of earning a bachelor's degree or above as their highest degree (87–89%).
- Post-secondary graduates from urban high schools consistently had the lowest rates of earning a bachelor's degree or above as their highest degree (77–82%) and the highest rates of earning an associate's degree as their highest degree (15–21%), compared to graduates from other geographic regions.

Is credential earning different by sector?

- PA high school graduates who started their post-secondary career by enrolling in a 4-year institution had higher rates of degree attainment, both in degree completion and the highest degree earned, than those who initially began at a 2-year institution.
- PA high school graduates who initially enrolled in a private institution had slightly higher rates of educational attainment than those who started at a public institution.

KEY FINDINGS:

Initiated and Completed Vertical Transfers by December of 2021

- About one-third of 2-year institution graduates in each cohort initiated a vertical transfer by enrolling in a 4-year institution.
- The latter cohorts, 2015, 2016, and 2017, had slightly higher rates of initiating vertical transfers (32–33%) than the 2014 cohort (29%).
- Post-secondary graduates in the earlier cohorts, 2014 and 2015, had higher rates of completing vertical transfers by subsequently earning a bachelor's degree or graduating from a 4-year institution, compared to the 2016 and 2017 cohorts.
- Female 2-year institution graduates initiated and completed vertical transfers at higher rates than males in each cohort.
- Compared to their counterparts, previously Special Education Status graduates had much lower rates of initiating and completing (by either measure) a vertical transfer.
- Previously EL Status 2-year institution graduates in the 2014, 2015, and 2016 cohorts initiated vertical transfers at higher rates than non-EL status graduates.
- Asian 2-year institution graduates consistently had the highest rates of initiating vertical transfers (46–59%) by subsequently enrolling in a 4-year institution.
- Asian post-secondary graduates completed vertical transfers, by either measure, at higher than average rates.
- White post-secondary graduates initiated (28–32%) and completed vertical transfers at rates comparable to the overall average of each cohort.
- Hispanic and Black or African American graduates initiated vertical transfers (29–36% and 31–37%, respectively) at rates comparable to the overall average, however the rates of completing for these student groups were consistently lower than average.
- Post-secondary graduates from urban and suburban high schools consistently initiated vertical transfers (30–36% and 32–36%, respectively) at higher rates than graduates from other geographic regions.
- Post-secondary graduates from suburban high schools had higher than average rates of completing vertical transfers across cohorts.

Introduction

Across the nation, rates of overall educational attainment have been increasing (De Brey et al., 2021; Espinosa et al., 2019). As of 2021, roughly half (49%) of 25 to 29-year-olds had an associate's degree or above, about four in ten (39%) had a bachelor's degree or above, and about one in ten (9%) had a master's degree or above (Karamarkovich, Ryu, and Scheetz, 2022). Further, disaggregation of educational attainment data by student group shows differences across gender, race/ethnicity, and various statuses. The student groups female, Asian, White (Espinosa et al., 2019; National Center for Education Statistics, 2022a), and high family socioeconomic status (Kena et al., 2015; McFarland et al., 2019) have better educational attainment outcomes, at any level, than their counterparts. These trends hold true for other educational outcomes, including initial post-secondary enrollment (McFarland et al., 2019; National Center for Education Statistics, 2022b).

The National Student Clearinghouse (NSC) Research Center reports that the majority of credential earners each year are first time post-secondary graduates (Karamarkovich, Ryu, and Scheetz, 2022). However, according to the NSC report, in 2020–21, 23% of bachelor's degree earners had previously earned an associate's degree and 9% of associate's degree earners had previously earned an undergraduate certificate. These findings and others (Meyer and Castleman, 2021) indicate a growing trend of post-secondary graduates “stacking” credentials and pursuing vertical pathways to bachelor's degree attainment. Recognizably, earning a credential (or credentials) in route to bachelor's degree attainment will lengthen the process. Although commonly referred to as “4-year” and “2-year” programs, a recent study found that bachelor's degrees (with or without a prior associate's degree) are often not earned within four years, and most associate's degrees are not earned within two years (Shapiro et al., 2016). Again, disaggregation of data regarding “time-to-degree” found that student groups female, Asian, and White, on average finish their bachelor's degrees in fewer months than their counterparts. While the student groups male, Black or African American, Hispanic, American Indian/Alaskan Native, Hawaiian/Pacific Islander, and Multi-racial, take longer, on average, to completion their bachelor's degree (Velez et al., 2019).

The “traditional” vertical pathway of transferring from a 2-year to 4-year institution (Baccalaureate program) can be an accessible and economical path upward. However, it is important to note that not all who vertically transfer with intent to earn a bachelor's degree persist to completion (Jenkins & Fink, 2015). As previously noted, time and other factors can deter post-secondary students in their vertical transfer pathways (Logue and Wutchiett, 2022). Further, transfer outcomes differ by student group; one study found that of those who transfer vertically, higher percentages of female and higher income post-secondary students complete a vertical transfer by earning a bachelor's degree (Shapiro et al., 2017).

An obstacle to post-secondary enrollment and completion that must be addressed is the disruption of in-person learning that began with the outbreak of the Covid-19 Pandemic in the spring of 2020. In the fall of that year, national post-secondary enrollment overall declined slightly (2.5%), but first-time student enrollment dropped by 13.1% (National Student Clearinghouse, 2020). As the effects of the pandemic persisted into the 2020–21 academic year, many post-secondary students expressed concern that it would negatively impact their ability to complete their degree (Marken, 2020). Further, potential first time enrollees and those already enrolled faced challenges and uncertainty in beginning or continuing their education in the 2021-22 academic year (National Center for Education Statistics, 2022c). In the fall of 2021, the NSC reported a 2.7% decrease in enrollment, but the rate of first-time student enrollment had stabilized (National Student Clearinghouse, 2021). The Covid-19 Pandemic also negatively impacted rates of vertical transfers for post-secondary students. According to a 2022 NSC report, there was a steep decline of 9.7% in rates of vertical transfers (2-year to 4-year institution) in the two years since the start of the pandemic (Causey et al., 2022). Thus, these conditions, particularly in the context of current time-to-degree studies, must be considered when interpreting the post-secondary outcomes of recent high school graduates.

Methodology and Data Sources

The goal of this study was to identify trends in both post-secondary degree attainment and transfers to baccalaureate programs by answering the following questions from [PDE's Research Agenda](#):

- **What are the measurable educational achievements for different populations in PA?**
- Is credential earning different by sector (2-year/4-year or public/private)?

Individual high school graduation records were obtained through the Pennsylvania Information Management system (PIMs) for the 2014, 2015, 2016, and 2017 school years. Further, post-secondary enrollment and graduation records of students who graduated high school during one of those four years were obtained from the NSC Student Tracker Services. The NSC data included postsecondary records for 2014–2017 PA high school graduates as of December 2021. To answer the main research question (addressing highest degree earned and transfers to baccalaureate programs), only those who graduated high school in the years 2014–2017 and subsequently earned a post-secondary credential by December of 2021 were included in the analysis. This December 2021 cut-off is 4.5 years after the 2017 cohort graduated high school. The final portion of this report, which addresses the sub-question, includes descriptive findings of PA high school graduates based on the type of institution they first enrolled in.

Several outcome variables were created to measure the educational achievements of each cohort of post-secondary graduates. Based on the frequency distribution of the degrees earned, post-secondary degrees and credentials were tiered to determine highest degree earned and rates of vertical transfer. The lowest tier, “Undergraduate Certificate”, included the non-degree values of “Credential”, “Post-secondary Diploma”, and “Undergraduate Certificate”. The second tier was “Associate’s Degree”, and the third tier was “Bachelor’s degree or Above” which included “Bachelor’s Degree”, “Post-bachelor’s Certificate”, “Master’s Degree”, and “Doctoral Degree”. The decision to tier the credentials this way was based on traditional vertical transfer pathways in post-secondary education, as discussed in the literature review (associate’s degree to bachelor’s degree). Further, Appendix Table 1 indicates that 12% or less of each cohort earned a master’s degree or Doctoral degree by December 2021, thus those degrees were combined with bachelor’s degrees and Post-bachelor’s Certificates to create the category of “Bachelor’s degree or Above”. Additionally, for conciseness when reporting results of vertical transfer, the phrase “Associate’s degree or below,” indicating associate’s degrees and undergraduate certificates, may be used to refer to the tiers “below” “Bachelor’s degree or Above”.

To answer the main research question, only those who graduated high school in the years 2014–2017 and subsequently earned a post-secondary credential by December of 2021 were included in the analysis. This December 2021 cut-off is 4.5 years after the 2017 cohort graduated high school.

For purposes of analysis, three measurements of vertical transfer were used based on the data available as well as previous literature:

- *The first measure, “Initiating a Vertical Transfer”, indicates enrollment in a 4-year institution after having previously graduated from a 2-year institution.*
- *“Completing a 4-Year Vertical Transfer”, indicates that one graduated from a 4-year institution after having previously graduated from a 2-year institution.*
- *Finally, “Completing a bachelor’s degree Vertical Transfer” indicates that one earned a bachelor’s degree after first earning an undergraduate certificate or an associate’s degree.*

Although a vertical transfer is commonly measured by attending a 2-year then 4-year institution, it was determined that another measurement was needed as many post-secondary students earn their associate’s degree or undergraduate certificate at a 4-year institution while simultaneously working towards earning their bachelor’s degree. Those students would not be captured in the “Completing a 4-Year Vertical Transfer” measure. To answer the research questions being addressed, crosstabulations were run to explore and report outcomes by different student groups.

Participants and Initial Descriptive Statistics

The total number of high school graduates in each cohort, as reported by PDE, is included in Table 1 for context. Additionally, Table 1 indicates the percentage of high school graduates each year that enrolled in a post-secondary institution. A consistent 68-71% of PA high school graduates each year went on to enroll in a post-secondary institution by December of 2021 (*Post-Secondary Enrollees as of December 2021*). The total number of high school graduates each year who then earned a post-secondary credential by December of 2021 is also included (*Post-secondary Graduates as of December 2021*). Table 1 shows that the total number of post-secondary graduates reported was 57,156 in the 2014 cohort, 54,655 in the 2015 cohort, 50,761 in the 2016 cohort, and 40,008 in the 2017 cohort. Further, all four cohorts were examined separately to explore potential differences in outcomes over time and based on demographic and geographic factors. The lower portion of Table 1 shows that the composition of student groups was very similar across cohorts. The majority of post-secondary graduates came from high schools in suburban areas (approximately 64%) and were comprised of a higher percentage of graduates who were female (56%–59%), White (83%–84%), non-Special Education Status (96%), non-economically disadvantaged (80%–81%), and non-English Learners (EL) (99.4%).

A consistent 68-71% of PA high school graduates each year went on to enroll in a post-secondary institution by December of 2021.

The fourth cohort was comprised of a lower number of post-secondary graduates (40,008). As explored in both the literature review and methodology sections, a likely explanation of the roughly 10,000 case difference between this cohort and the others is that the average post-secondary student takes about five years to earn a “4-year degree”. Additionally, the five year estimate reported by the NSC (Shapiro et al., 2016) does not take into account the recent effects of Covid-19 on post-secondary enrollment, persistence, and retention. Despite the difference in the total

number of post-secondary graduates, the general demographic breakdown is comparable to the other cohorts. Although, compared to the other cohorts, the percentage difference between male and female graduates widened; fifty-nine percent of post-secondary graduates in the cohort were female and 40.9% were male. Eighty-four percent of the cohort identified as White, 5.5% as Asian, 5.3% as Black or African American, 4.2% as Hispanic, 1.2% as Multi-racial, and less than 1% as either American Indian/Alaskan Native or Native Hawaiian or other Pacific Islander. Further, looking at status at high school graduation, the majority of degree earners were not identified as Special Education Status (96%), Economic Disadvantaged Status (79.9%), or EL Status (99.4%). Sixty-five percent of degree earners graduated from a suburban high school, 16.2% from a rural high school, 10.6% from a city, and 8.4% from a town.

TABLE 1. Demographic Statistics for Post-Secondary Graduates by Cohort

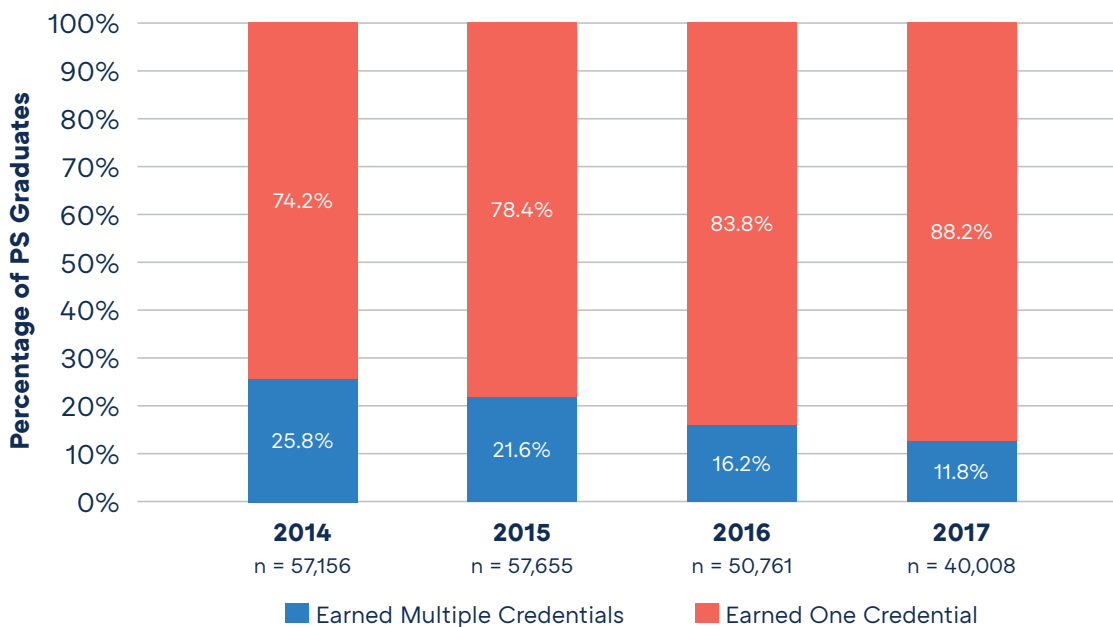
	2014 % (n)	2015 % (n)	2016 % (n)	2017 % (n)
High School Graduates (PDE)	128,042	123,788	125,051	125,505
Post-Secondary Enrollees as of Dec. 2021	70.8 (90,669)	70.3 (87,020)	69.1 (86,432)	68.3 (85,663)
Post-secondary Graduates as of Dec. 2021	63.0 (57,156)	62.8 (54,655)	58.7 (50,761)	46.7 (40,008)
Gender				
Female	55.8 (31,866)	56.7 (30,970)	56.8 (28,856)	59.1 (23,634)
Male	44.2 (25,290)	43.3 (23,685)	43.2 (21,905)	40.9 (16,374)
Race/Ethnicity				
American Indian/Alaskan Native	0.1 (63)	0.1 (57)	0.1 (48)	0.1 (34)
Black or African American	6.7 (3,837)	6.7 (3,664)	6.5 (3,275)	5.3 (2,108)
Hispanic	3.7 (2,122)	3.9 (2,158)	4.0 (2,035)	4.2 (1,677)
White	83.6 (47,801)	82.9 (45,319)	82.6 (41,921)	83.7 (33,474)
Multi-racial	1.0 (549)	1.1 (575)	1.2 (628)	1.2 (496)
Asian	4.8 (2,746)	5.2 (2,836)	5.6 (2,822)	5.5 (2,184)
Native Hawaiian or other Pacific Islander	0.1 (38)	0.1 (46)	0.1 (32)	0.1 (35)
Special Education Status				
No	95.5 (54,574)	95.5 (52,209)	95.6 (48,548)	96.0 (38,391)
Yes	4.5 (2,582)	4.5 (2,446)	4.4 (2,213)	4.0 (1,617)
Economic Disadvantaged Status				
No	81.3 (46,462)	80.5 (43,977)	80.3 (40,762)	79.9 (31,965)
Yes	18.7 (10,694)	19.5 (10,678)	19.7 (9,999)	20.1 (8,043)
EL Status				
No	99.4 (56,809)	99.4 (54,336)	99.4 (50,476)	99.4 (39,777)
Yes	0.6 (347)	0.6 (319)	0.6 (285)	0.6 (231)
Geographic Region				
City	11.7 (6,663)	11.3 (6,182)	11.3 (5,748)	10.6 (4,236)
Rural	16.6 (9,486)	16.4 (8,944)	16.3 (8,271)	16.2 (6,497)
Suburban	63.3 (36,187)	63.8 (34,896)	64.2 (32,585)	64.8 (25,925)
Town	8.4 (4,820)	8.5 (4,633)	8.2 (4,157)	8.4 (3,350)

Note: No full results will be reported for post-secondary graduates who identify as Native Hawaiian or other Pacific Islander and American Indian/Alaskan Native as the number of participants in each cohort became too low to report when broken out by outcome.

Credential Earning by December of 2021

Consistent with the overall trend discussed in the literature review, across all four cohorts in this study, the majority of post-secondary graduates had earned one post-secondary credential (of any kind). Whether a student earned a single credential or multiple credentials was determined by counting the number of post-secondary graduation records by December of 2021 for each participant. Figure 1 shows that post-secondary graduates in the 2014 cohort had the highest percentage of earning multiple credentials (25.8%), while 21.6% of the 2015 cohort earned multiple credentials. Further, only 16.2% of the 2016 cohort and 11.8% of the 2017 cohort earned multiple post-secondary credentials by December of 2021.

FIGURE 1. Postsecondary Credential Earning Through December of 2021 by Cohort



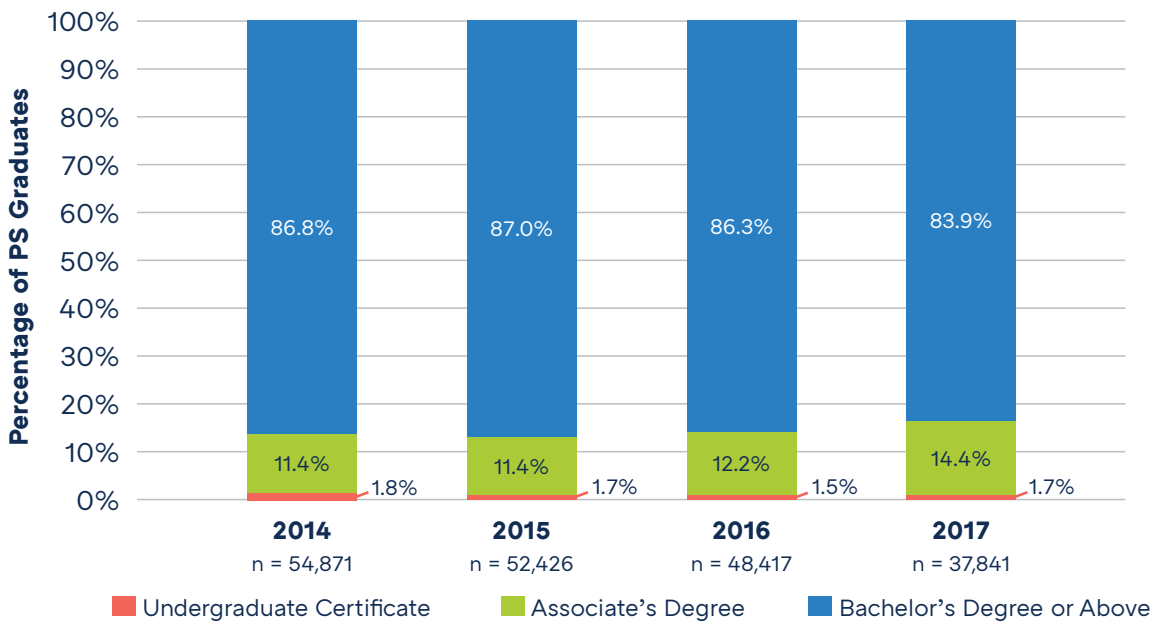
Results

■ WHAT ARE THE MEASURABLE EDUCATION ACHIEVEMENTS FOR DIFFERENT POPULATIONS IN PENNSYLVANIA?

Highest Degree Earned

The majority of post-secondary graduates in each cohort earned a bachelor’s degree or above as their highest degree by December of 2021, while lower percentages earned an associate’s degree, and less than 2% of any cohort’s highest degree earned was an undergraduate certificate. Specifically, in the 2014 cohort, 86.8% of post-secondary graduates earned a bachelor’s degree or above as their highest degree, followed by an associate’s degree (11.4%), or an undergraduate certificate (1.8%). This overall trend in degree attainment remains consistent across cohorts, despite less time lapsing between high school graduation and postsecondary completion for the 2016 and 2017 cohorts.

FIGURE 2. Highest Degree Earned by December of 2021 by Cohort

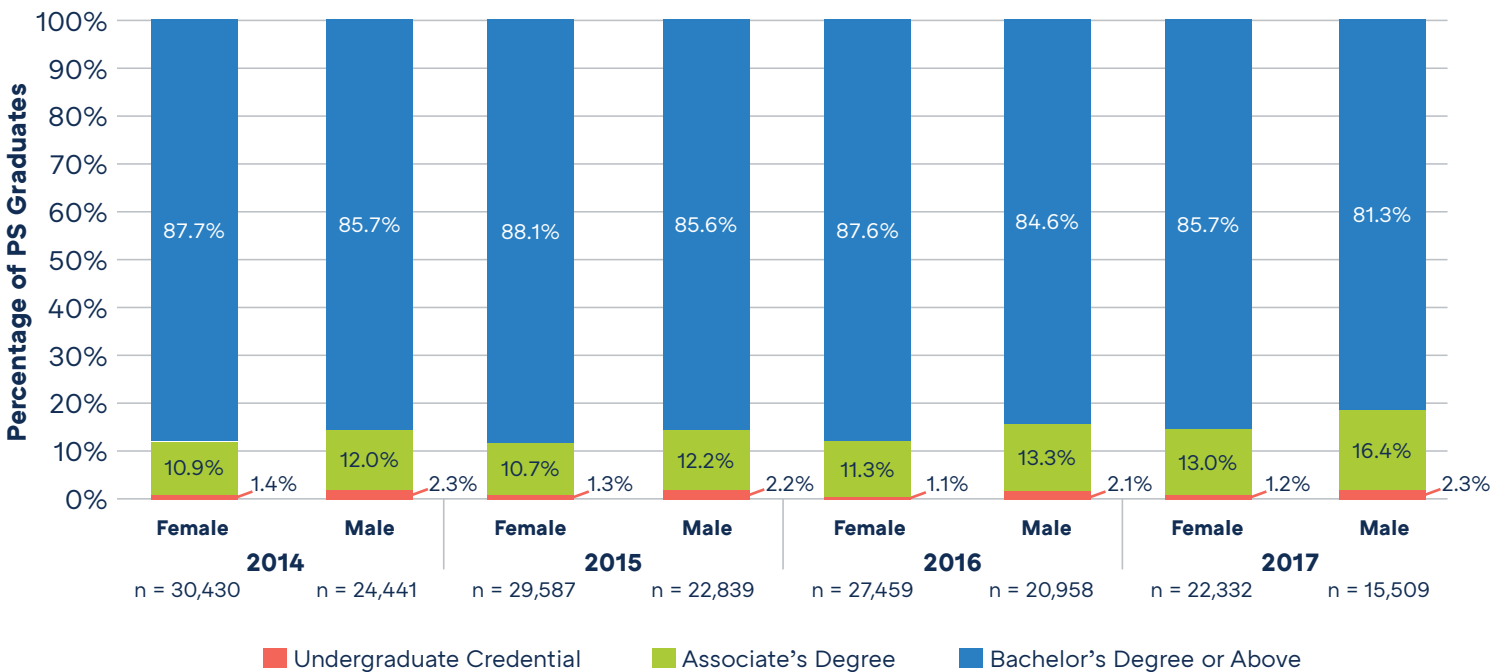


Note: Some post-secondary students with a graduation record were missing “degree type” data, thus were excluded from “highest degree earned” results.

Highest Degree Earned and Gender

Overall, in each cohort, the percentage breakdown of highest degree earned for female and male post-secondary graduates was comparable to the overall average from Figure 2. Figure 3 shows that across all four cohorts, the majority of female and male post-secondary graduates (greater than 80%) earned a bachelor's degree or above as their highest degree by December of 2021. The percentage of female post-secondary graduates who earned a bachelor's degree or above was slightly higher than male graduates across all cohorts. This is consistent with the overall results across cohorts, although a slightly lower percentage of male and female students from the 2017 cohort earned a bachelor's degree or above and a slightly higher percentage earned an associate's degree by December 2021.

FIGURE 3. Highest Degree Earned by December of 2021 by Gender

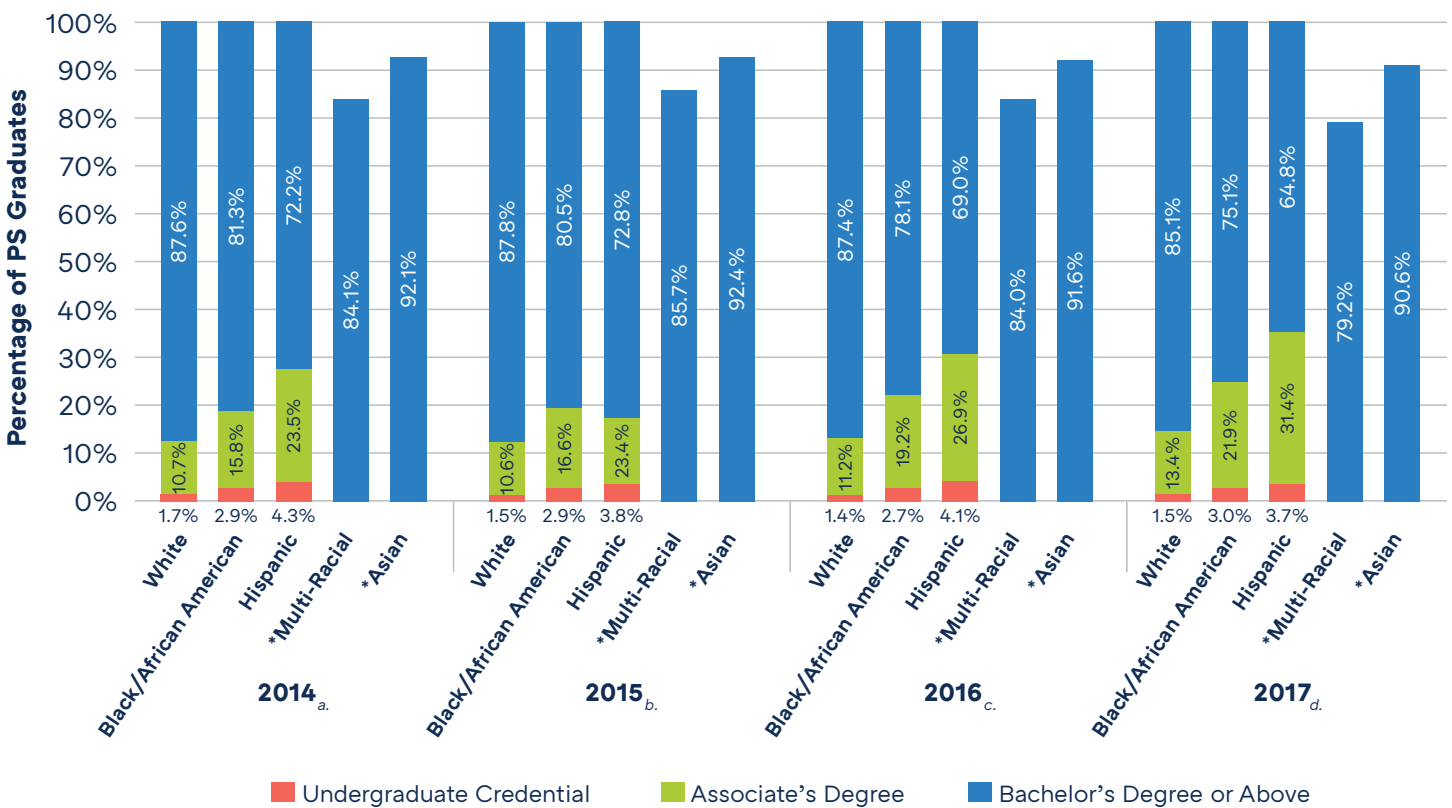


Highest Degree Earned and Race/Ethnicity

Figure 4 shows that across all cohorts, a majority of post-secondary graduates earned a bachelor’s degree or above as their highest degree by December of 2021, regardless of race/ethnicity. The percentage of Hispanic post-secondary graduates in each cohort who earned a bachelor’s degree or above as their highest degree was significantly lower compared to other racial/ethnic groups, while the percentage to earn an associate’s degree or undergraduate certificate as highest degree was notably higher. Further, less than 10 percent of Asian graduates earned an associate’s degree or undergraduate certificate as their highest degree. The percentage of Asian graduates in each cohort who earned a bachelor’s degree or above as their highest degree was notably higher than the overall average and compared to other racial/ethnic groups. The percentages of Asian and Multi-racial graduates who earned either an undergraduate certificate or an associate’s degree as their highest degree have been suppressed due to low counts.

Regarding Native Hawaiian or other Pacific Islander and American Indian/Alaskan Native graduates, in each cohort the number of undergraduate certificate earners and associate’s degree earners was too low to report. However, comparable to the overall trend, in each cohort the majority of graduates did earn a bachelor’s degree or above as their highest degree earned by December of 2021.

FIGURE 4. Highest Degree Earned by December of 2021 by Race/Ethnicity



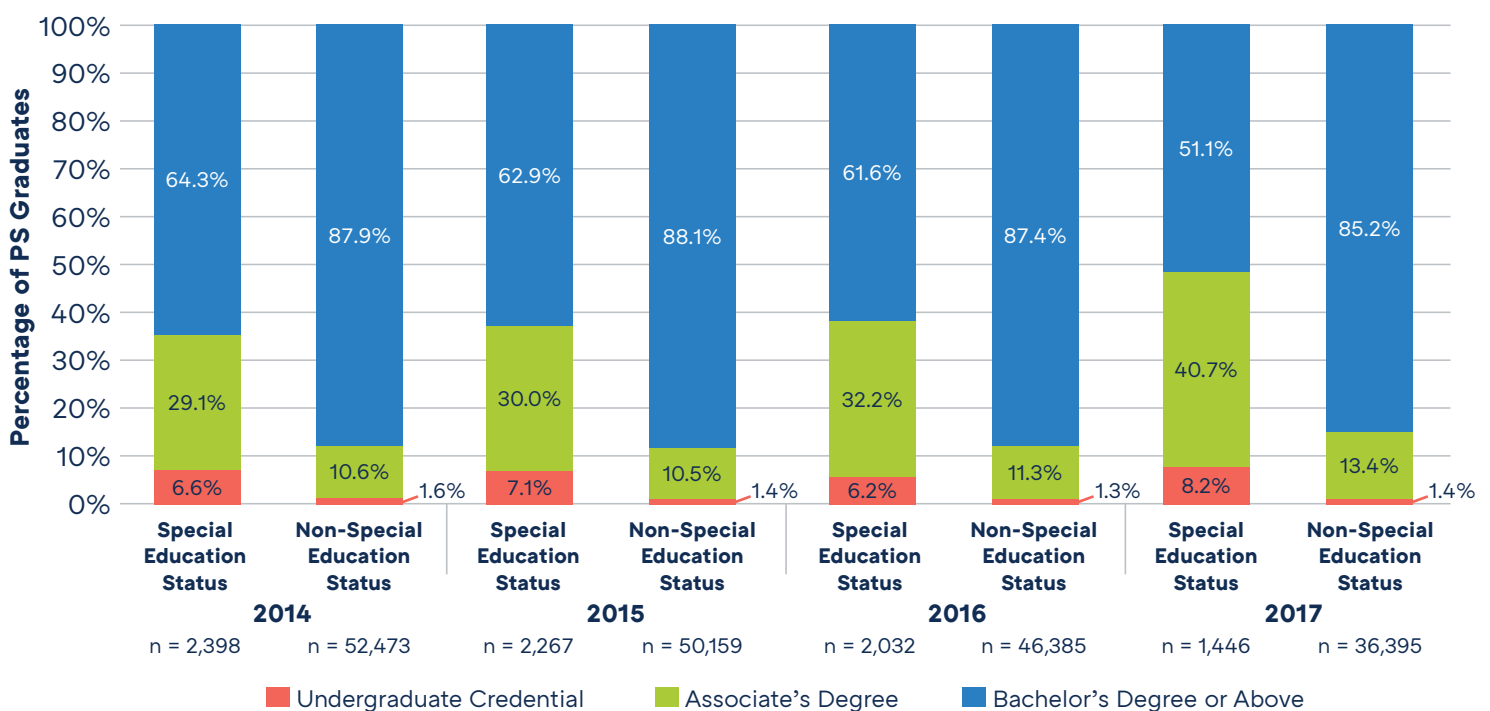
*Counts Too Low to Report for undergraduate certificate or associate’s degree

a. n=45,952; n=3,614; n=1,989; n=527; n=2,694; b. n=43,521; n=3,434; n=2,031; n=545; n=2,796; c. n=40,035; n=3,043; n=1,902; n=593; n=2,767; d. n=31,673; n=1,949; n=1,550; n=477; n=2,128

Highest Degree Earned and Special Education Status

Although a majority of both Special Education Status and non-Special Education students earned a bachelor's degree or above as their highest degree by December of 2021, Figure 5 shows that the percentage is significantly lower for Special Education Status students (51%–64%). For the 2014, 2015, and 2016 cohorts, about 30% of previously special education post-secondary graduates earned an associate's degree as their highest degree earned and 40.7% for the 2017 cohort. The rate of earning an associate's degree as highest degree earned was significantly higher for those who were previously Special Education Status compared to non-Special Education Status students and the overall average. Low percentages of Special Education Status graduates earned an Undergraduate Credential as their highest degree earned (6.2%–8.2%). However, Figure 5 shows that again these rates are slightly higher compared to those of non-Special Education Status students.

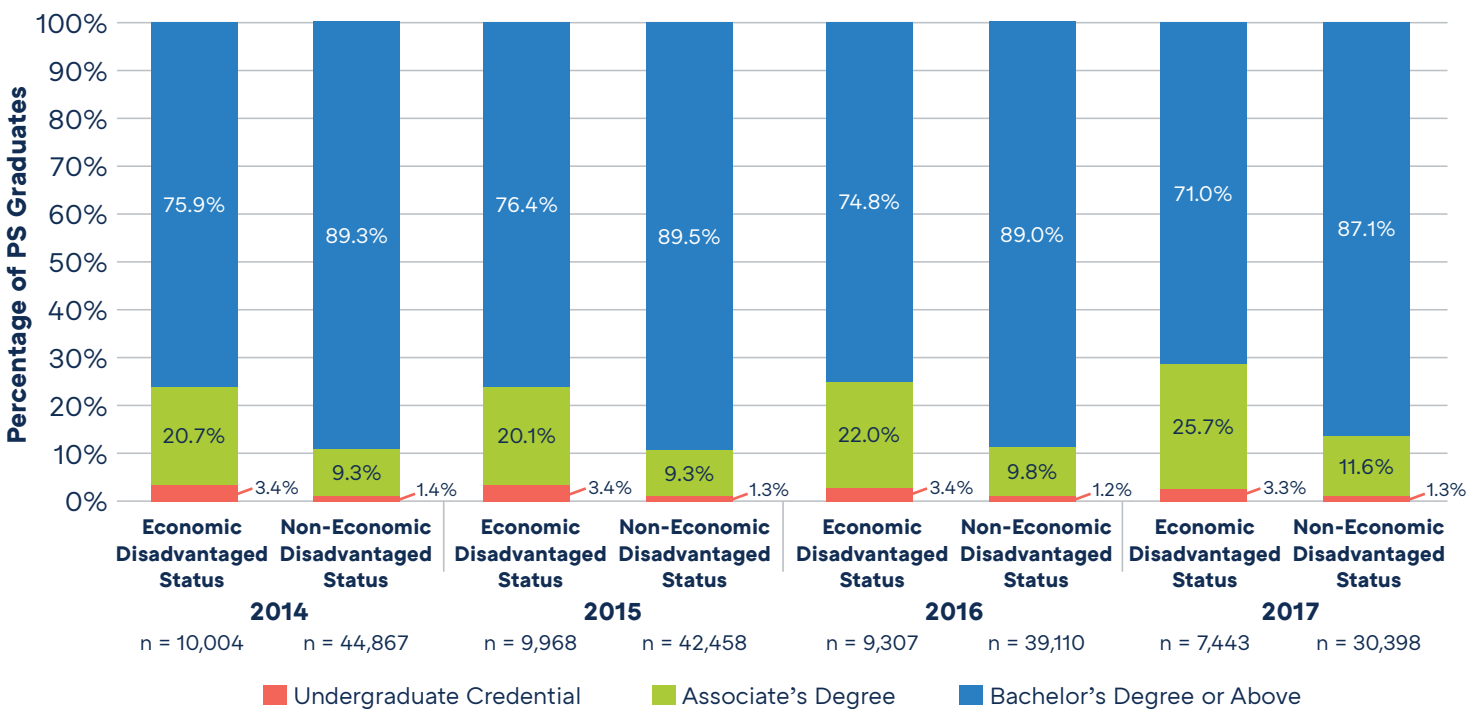
FIGURE 5. Highest Degree Earned by December of 2021 by Special Education Status



Highest Degree Earned and Economic Disadvantaged Status

The overall trend of highest degree earned attainment remains true for post-secondary graduates who were Economic Disadvantaged Status at the time of their high school graduation. In each cohort, the majority of previously Economic Disadvantaged Status and non-Economic Disadvantaged Status graduates earned a bachelor's degree or above as their highest degree by December of 2021. However, Figure 6 shows that compared to non-Economic Disadvantaged Status graduates, the percentages of previously Economic Disadvantaged Status graduates in each cohort earning a bachelor's degree or above as their highest degree was smaller. Further, the rates of Economic Disadvantaged Status graduates earning an undergraduate certificate or associate's degree were higher than non-Economic Disadvantaged Status graduates.

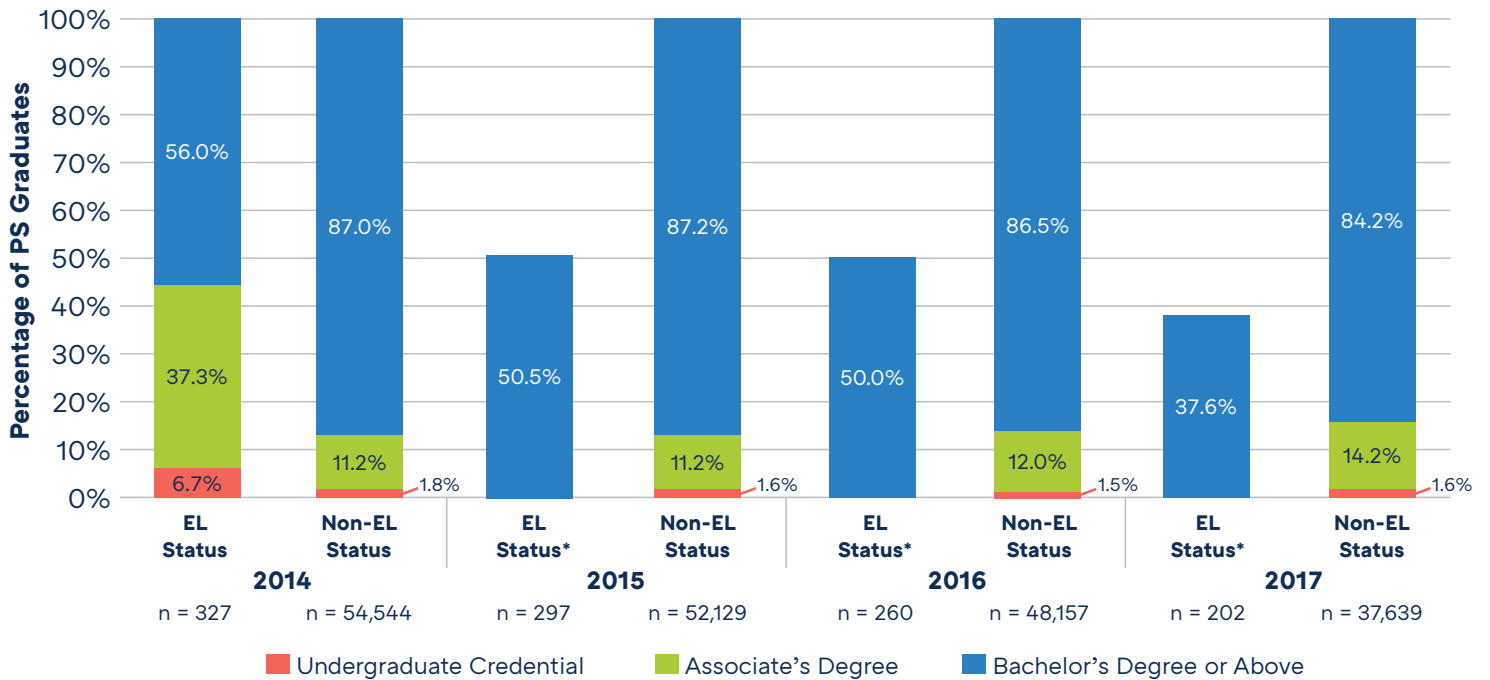
FIGURE 6. Highest Degree Earned by December of 2021 by Economic Disadvantage Status



Highest Degree Earned and EL Status

The previously described trend of highest degree attainment does not remain true for post-secondary graduates who were EL Status at the time of their high school graduation. About half of post-secondary graduates who were previously EL Status earned a bachelor’s degree or above as their highest degree in the 2014, 2015, and 2016 cohorts and less than half of the 2017 cohort did. Figure 7 illustrates that across cohorts, these percentages were significantly lower than those of non-EL Status graduates. The percentages of EL Status graduates who earned either an undergraduate certificate or an associate’s degree as their highest degree have been suppressed due to low counts.

FIGURE 7. Highest Degree Earned by December of 2021 by EL Status

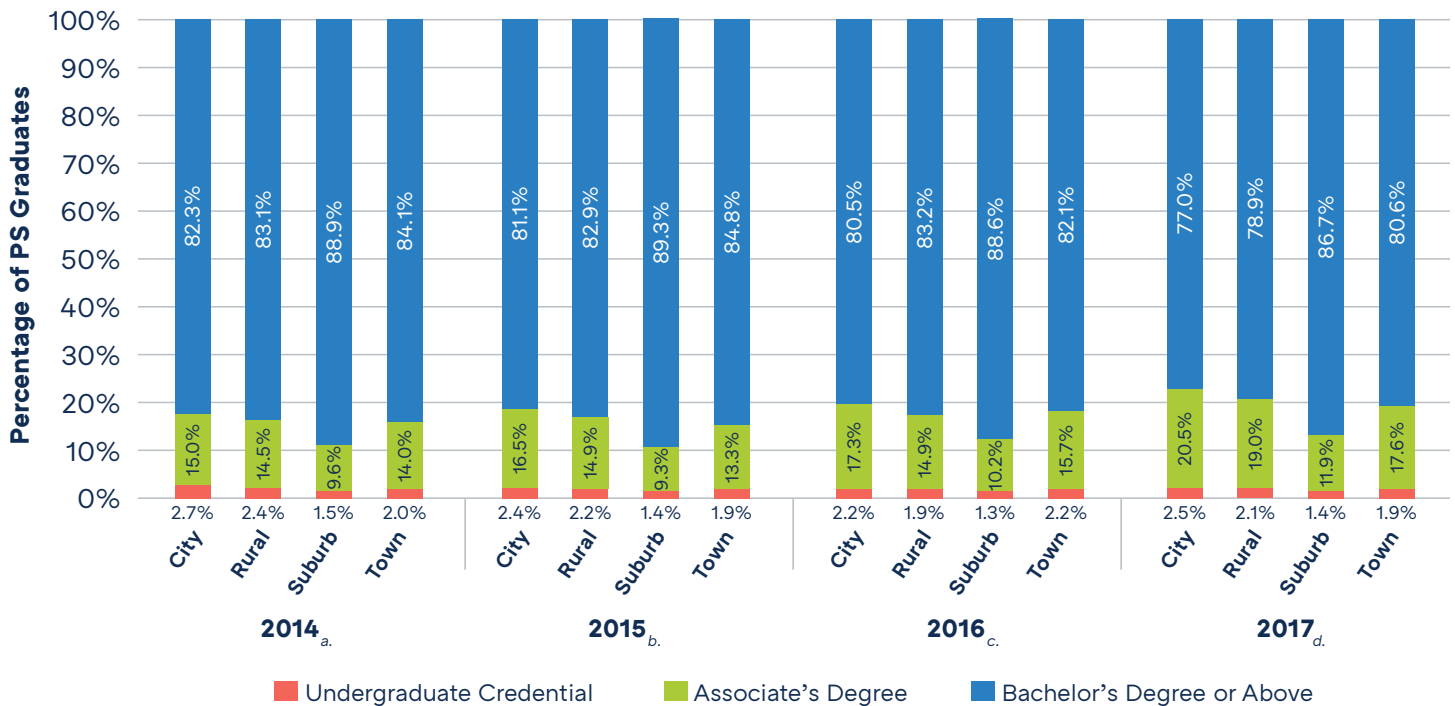


*Counts Too Low to Report for undergraduate certificate or associate’s degree

Highest Degree Earned and Geographic Region

Across all cohorts, a majority of post-secondary graduates earned a bachelor’s degree or above as their highest degree by December of 2021, regardless of geographic region. The highest rate of bachelor’s degree attainment was graduates from suburban high schools (87%+). Post-secondary graduates from cities consistently had the lowest rates of earning a bachelor’s degree or above as their highest degree (77–82%), compared to graduates from other geographic regions. Thus, graduates from cities consistently had higher rates of earning an associate’s degree as their highest degree (15–21%), compared to graduates from other geographic regions.

FIGURE 8. Highest Degree Earned by December of 2021 by Geographic Region



a. n=6,322; n=8,879; n=35,160; n=4,510; b. n=5,820; n=8,423; n=33,869; n=4,314; c. n=5,420 n=7,710; n=31,437; n=3,850; d. n=3,958 n=5,997; n=24,824; n=3,062

Transfer to Baccalaureate Program

As previously noted, three measurements were used to best capture rates of vertical transfers. Post-secondary credentials and institutions were categorized and tiered to indicate vertical transfer. Based on the data available, the three measurements are:

- **Initiated a Vertical Transfer:** *Enrollment* in a 4-year institution after having previously *graduated* from a 2-year institution(s). Only those whose first credential was earned from a 2-year institution were included in this analysis.
- **Completed a 4-Year Vertical Transfer:** *Graduation* from a 4-year institution after having previously *graduated* from a 2-year institution(s). Only those whose first credential was earned from a 2-year institution were included in this analysis.

- **Completed a bachelor’s degree Vertical Transfer:** *Earned* a bachelor’s degree after having previously *earned* an undergraduate certificate(s) or associate’s degree(s). Only those who had only earned an undergraduate certificate or an associate’s degree (henceforth referred to as “associate’s degree or below”) were included in this analysis.

As noted in each measurement, only post-secondary graduates who meet certain criteria related to the timing of graduation/enrollment are included in the crosstabulations. Table 2 reports the total number of post-secondary graduates included in each measure by cohort.

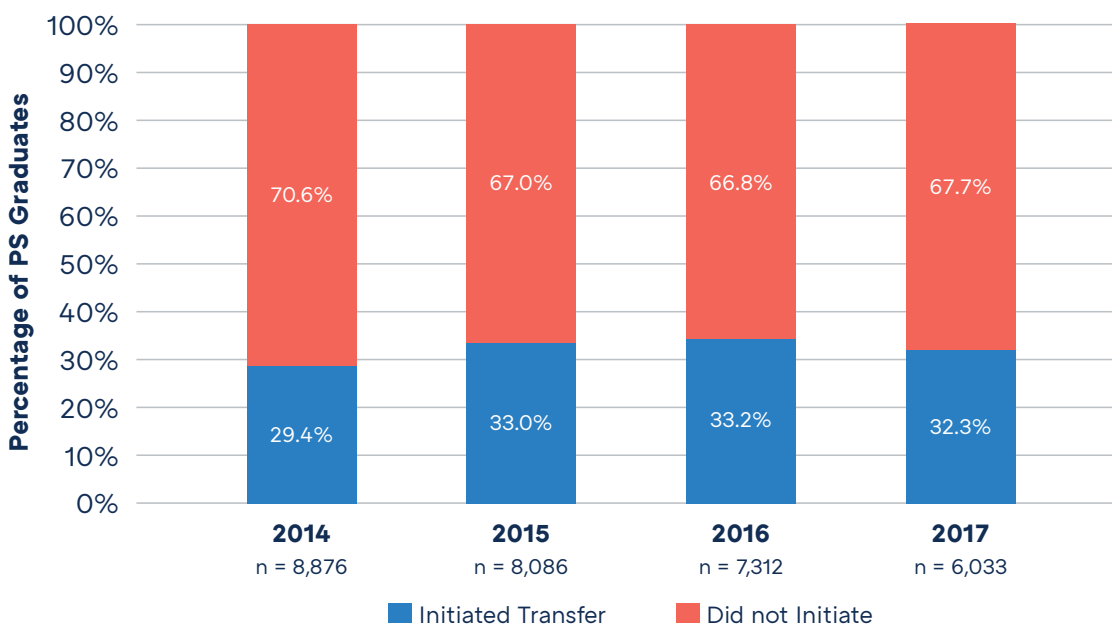
TABLE 2. Total Number of Post-Secondary Graduates Included in Vertical Transfer Analyses by Cohort

	Total number of post-secondary graduates whose first credential was earned from a 2-year institution	Total number of post-secondary graduates whose first credential was an undergraduate certificate or an associate’s degree
2014 cohort	8,876	11,657
2015 cohort	8,086	10,666
2016 cohort	7,312	9,592
2017 cohort	6,033	7,990

Initiating a Vertical Transfer

In each cohort, the majority of graduates of 2-year institutions did not initiate a vertical transfer by enrolling in a 4-year institution by December of 2021. Overall, 29–33% of students who first graduated from a 2-year institution in each cohort initiated a vertical transfer. Interestingly, Figure 9 also indicates that the percentage of 2-year institution graduates in each cohort who initiated a vertical transfer remains generally about the same for the 2015–2017 cohorts, while the 2014 cohort is slightly lower.

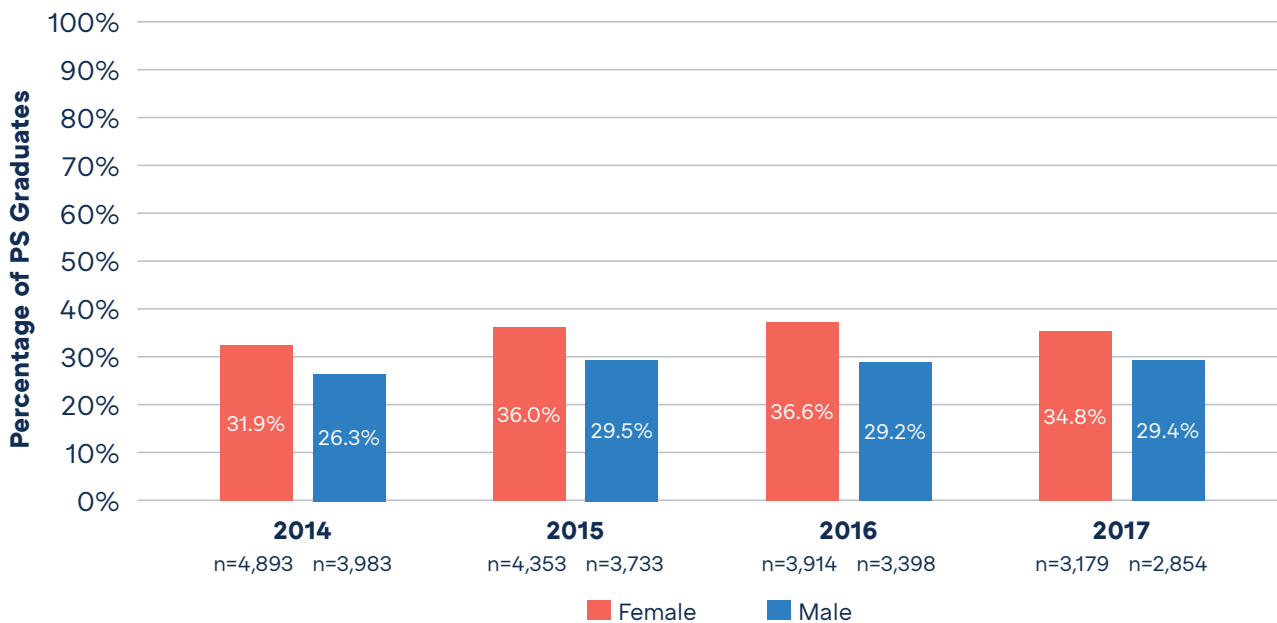
FIGURE 9. Initiated a Vertical Transfer by December of 2021 by Cohort



Initiated a Vertical Transfer and Gender

In each cohort, the majority of female and male post-secondary graduates from 2-year institutions did not go on to enroll in a 4-year institution by December of 2021. For female initial 2-year institution graduates, 32–37% of each cohort initiated a vertical transfer while the remaining 63–68% did not. Figure 10 indicates that across cohorts, female 2-year institution graduates consistently had higher rates of enrolling in a 4-year institution compared to male 2-year institution graduates and the overall average.

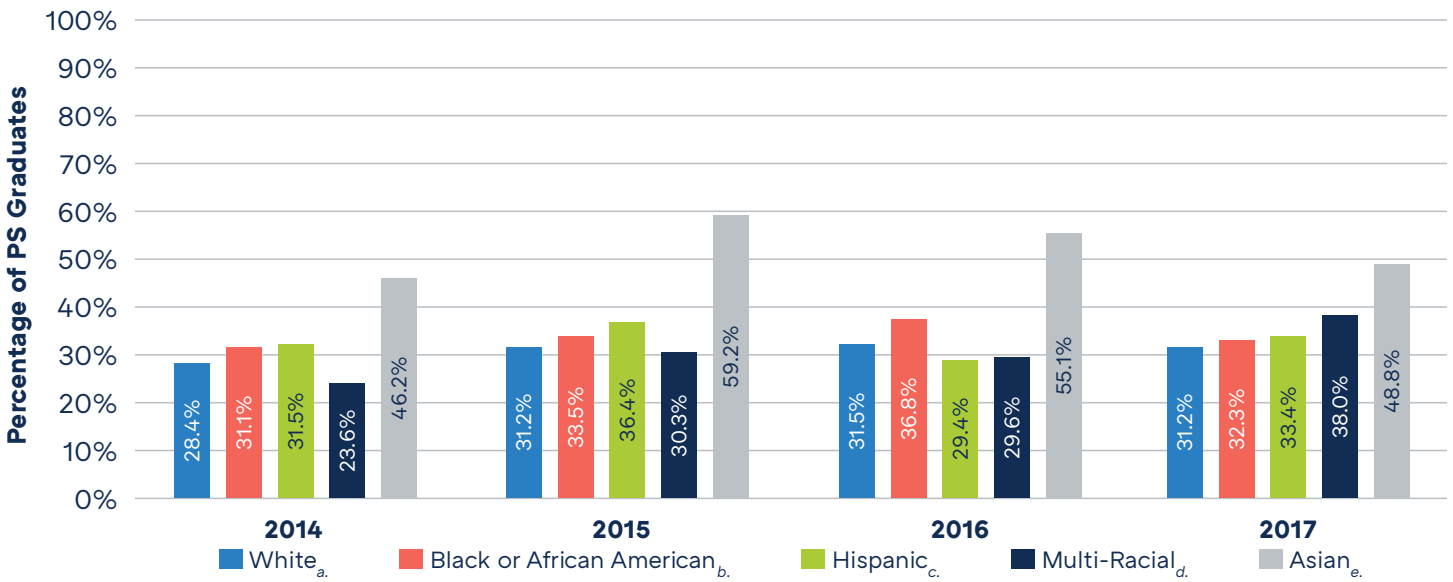
FIGURE 10. Initiated a Vertical Transfer by December of 2021 by Gender



Initiated a Vertical Transfer and Race/Ethnicity

Overall, Figure 11 shows patterns in the rates of each racial/ethnic student group initiating a vertical transfer by enrolling in a 4-year institution by December of 2021. The percentage of Asian 2-year institution graduates who initiated a vertical transfer in each cohort was consistently higher than those of other racial/ethnic groups, at 46–59%. The majority of White, Black or African American, Hispanic, and Multi-racial graduates did not initiate a vertical transfer. For Black or African American 2-year institution graduates, the rates of initiating a vertical transfer were consistently higher than or equal to the overall average (31–37%). For White and Hispanic graduates, the rates of initiating a transfer across cohorts were generally comparable to the overall averages, while the percentage of Multi-racial graduates who initiated in each cohort fluctuated above and below the overall average.

FIGURE 11. Initiated a Vertical Transfer by December of 2021 by Race/Ethnicity



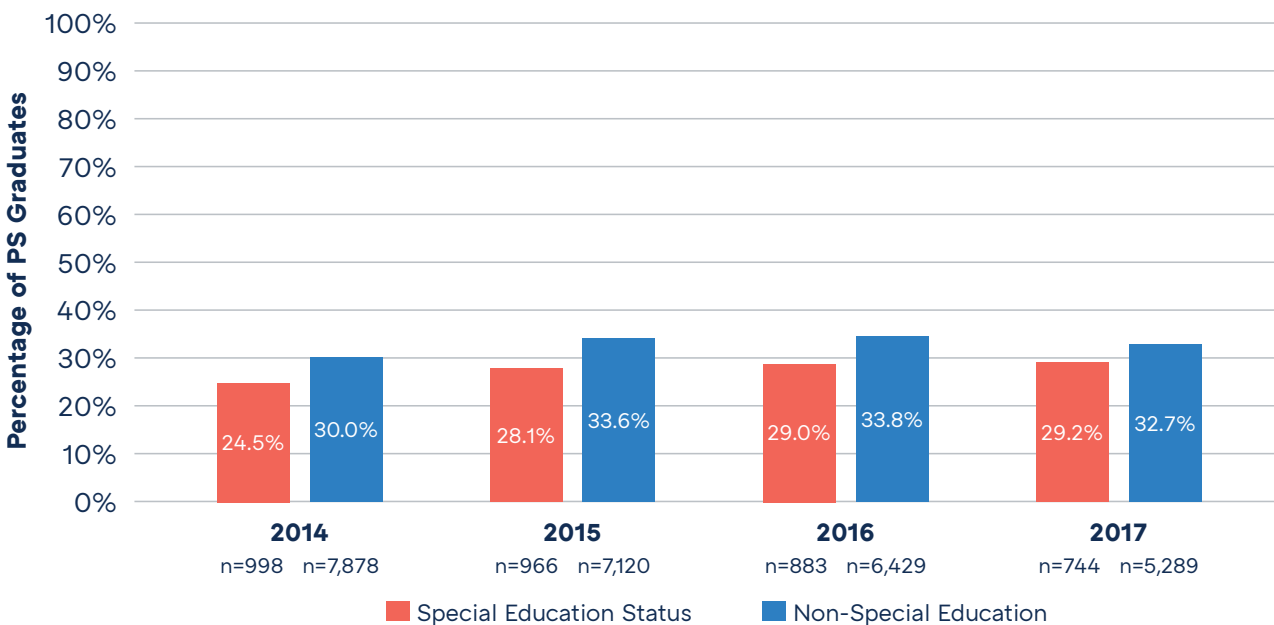
Initiated Totals as Reported in Figure 9: 29.4%; 33.0%; 33.2%; 32.3%

a. n=6,910; n=6,208; n=5,496; n=4,652; b. n=852; n=817; n=761; n=508; c. n=677; n=638; n=641; n= 548; d. n=106; n=89; n=108; n=100; e. n=316; n=316; n=287; n=211

Initiated a Vertical Transfer and Special Education

For 2-year post-secondary graduates who were Special Education Status at the time of their high school graduation, the percentage of students who initiated a vertical transfer was lower compared to the overall averages and non-Special Education Status graduates in each cohort. Additionally, Figure 12 shows that the majority of 2-year post-secondary graduates in each cohort did not enroll in a 4-year institution by December of 2021, regardless of Special Education Status. Beginning with the 2014 cohort, the percentage of previously Special Education Status 2-year institution graduates who enrolled in a 4-year institution increased gradually through 2017.

FIGURE 12. Initiated a Vertical Transfer by December of 2021 by Special Education Status

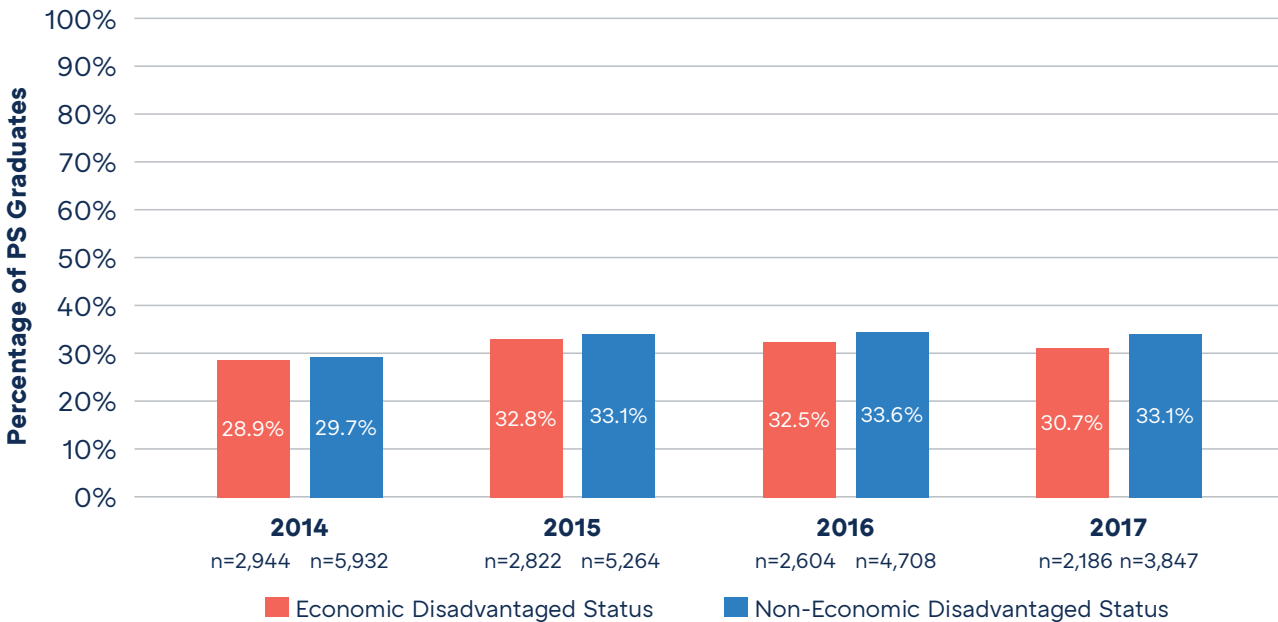


Initiated Totals as Reported in Figure 9: 29.4%; 33.0%; 33.2%; 32.3%

Initiated a Vertical Transfer and Economic Disadvantaged Status

Figure 13 shows that the rate of initiating a vertical transfer in each cohort was comparable for Economic Disadvantaged Status and non-Economic Disadvantaged graduates. Comparable to the overall trend, the majority of post-secondary graduates from 2-year institutions did not initiate a vertical transfer by enrolling in a 4-year institution by December of 2021, regardless of Economic Disadvantaged Status.

FIGURE 13. Initiated a Vertical Transfer by December of 2021 by Economic Disadvantaged

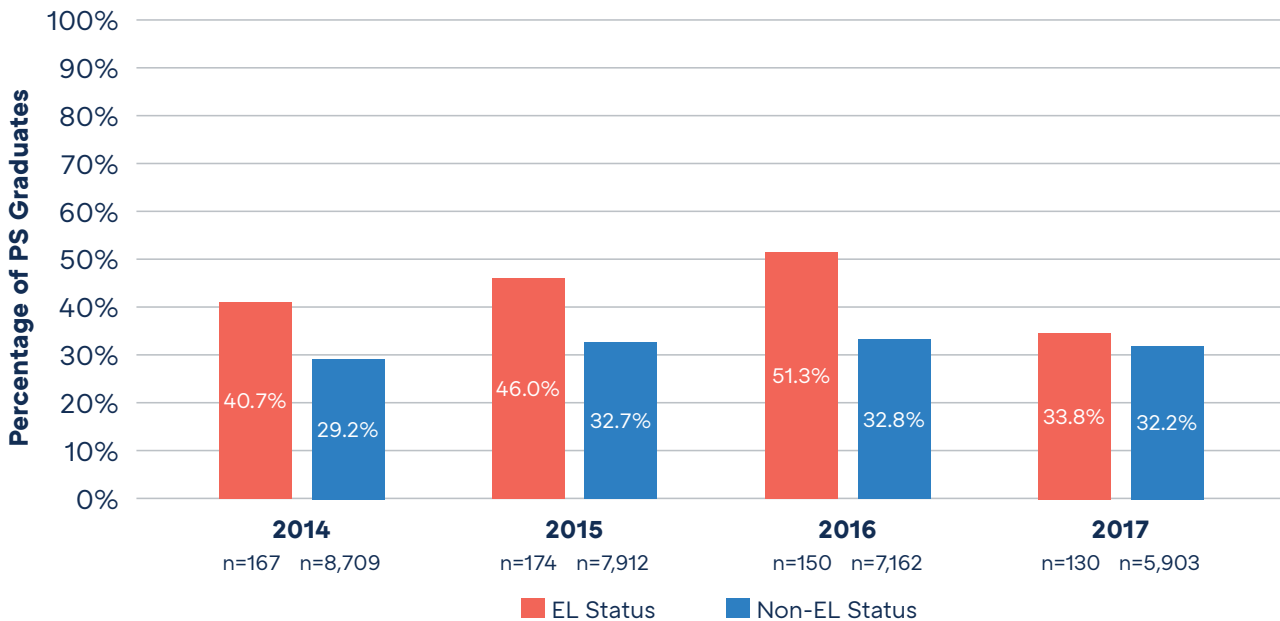


Initiated Totals as Reported in Figure 9: 29.4%; 33.0%; 33.2%; 32.3%

Initiated a Vertical Transfer and EL Status

Figure 14 shows that the percentage of EL Status post-secondary graduates from 2-year institutions who initiated a vertical transfer by enrolling in a 4-year institution was notably higher than non-EL Status post-secondary graduates and the overall average. For post-secondary graduates from 2-year institutions who were EL Status at the time of their high school graduation, the percentage of students who initiated a vertical transfer by enrolling in a 4-year institution by December of 2021 varied in each cohort (41%; 46%; 51%; 34%) but was larger than the vertical transfer rates of non-EL Status students for the 2014–2016 cohorts.

FIGURE 14. Initiated a Vertical Transfer by December of 2021 by EL Status

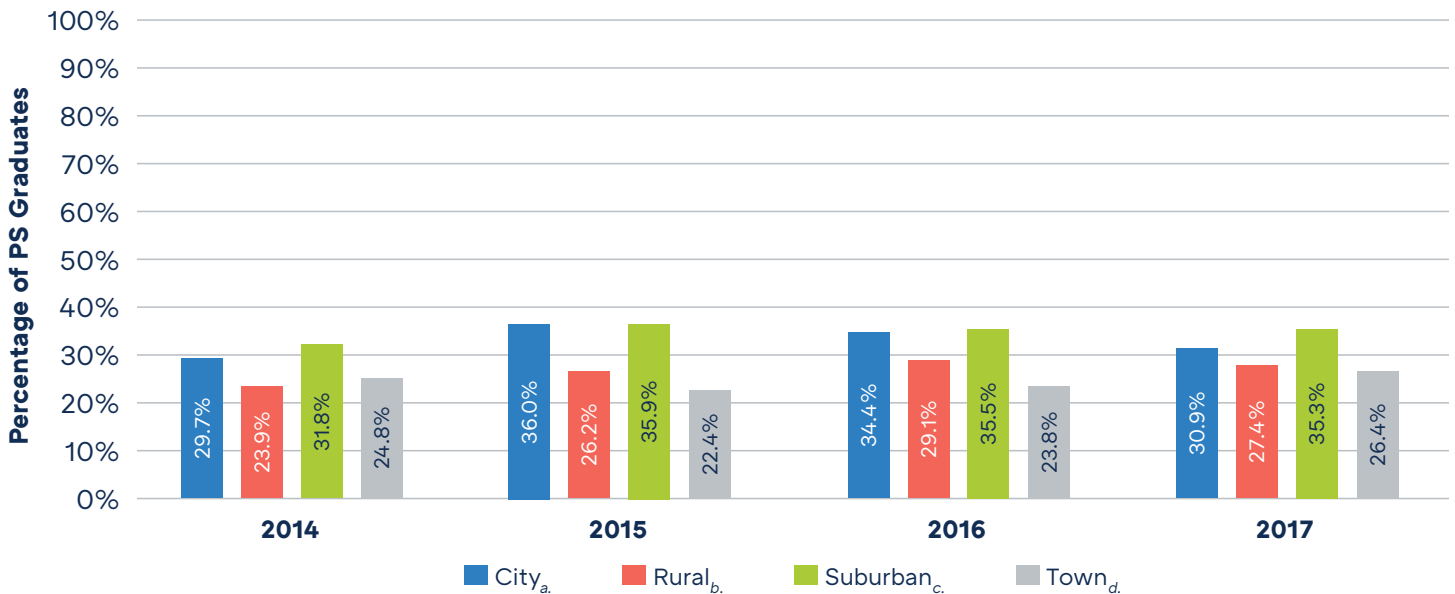


Initiated Totals as Reported in Figure 9: 29.4%; 33.0%; 33.2%; 32.3%

Initiated a Vertical Transfer and Geographic Region

Across all cohorts, the majority of 2-year institution graduates from any geographic region did not initiate a vertical transfer by enrolling in a 4-year institution by December of 2021. Less than 30% of 2-year institution graduates in each cohort from towns or rural high schools initiated a vertical transfer. Overall Figure 15 shows that graduates from towns and rural areas consistently had the lowest rates of initiating a vertical transfer. Thirty to thirty-six percent of 2-year institution graduates in each cohort from cities and suburban high schools initiated a vertical transfer. The percentage of 2-year institution graduates from suburban areas initiating a vertical transfer was consistently higher than that of other geographic regions and the overall average of each cohort.

FIGURE 15. Initiated a Vertical Transfer by December of 2021 by Geographic Region



Initiated Totals as Reported in Figure 9: 29.4%; 33.0%; 33.2%; 32.3%

a. n=1,355; n=1,318; n=1,200; n=947; b. n=1,663; n=1,499; n=1,302; n=1,205;

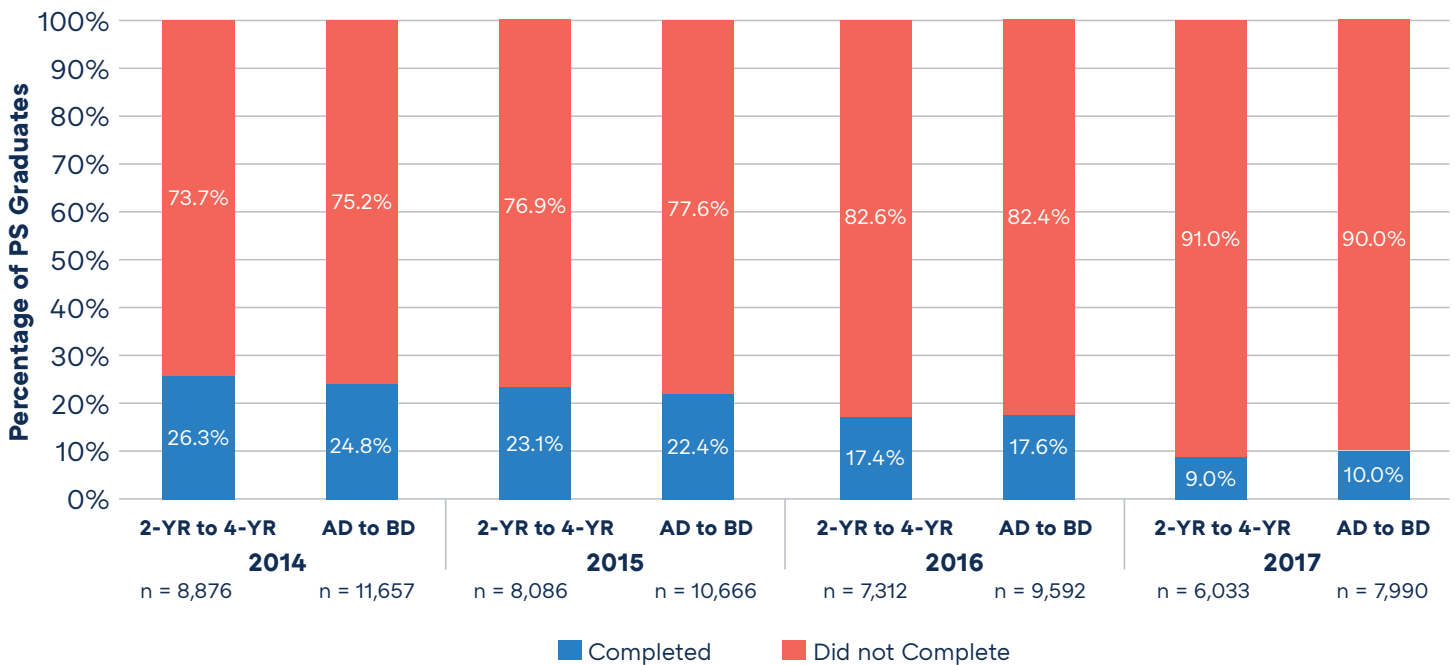
c. n=5,101; n=4,567; n=4,184; n=3,362; d. n=757; n=702; n=626; n=519

Completed a Vertical Transfer

For purposes of analysis, the measurements of “Graduation from a 4-year institution after having previously graduated from a 2-year institution(s)” and “Earned a bachelor’s degree after having previously earned an undergraduate certificate(s) or associate’s degree(s)” are reported simultaneously to explore trends in completing a vertical transfer by either measure.

In this study, the majority of post-secondary graduates in each cohort did not complete a vertical transfer by December of 2021. Figure 16 shows that the rates of each cohort completing a vertical transfer, by either measurement, are comparable. By both indicators, the 2014 cohort had the highest rates of completing a vertical transfer by December of 2021. Twenty-six percent of 2-year institution graduates in the 2014 cohort completed a vertical transfer by graduating from a 4-year institution by December of 2021, while 23.1%, 17.4%, and only 9.1% of 2-year institution graduates completed a 4-year vertical transfer in the 2015, 2016, and 2017 cohorts, respectively. Similarly, 24.8% of post-secondary graduates who earned at least an undergraduate certificate or associate’s degree in the 2014 cohort completed a vertical transfer by earning a bachelor’s degree by December of 2021. Further, 22.4%, 17.6%, and 10% of earners of an associate’s degree or less completed a bachelor’s degree vertical transfer in the 2015, 2016, and 2017 cohorts, respectively.

FIGURE 16. Completed a Vertical Transfer Through December of 2021 by Cohort

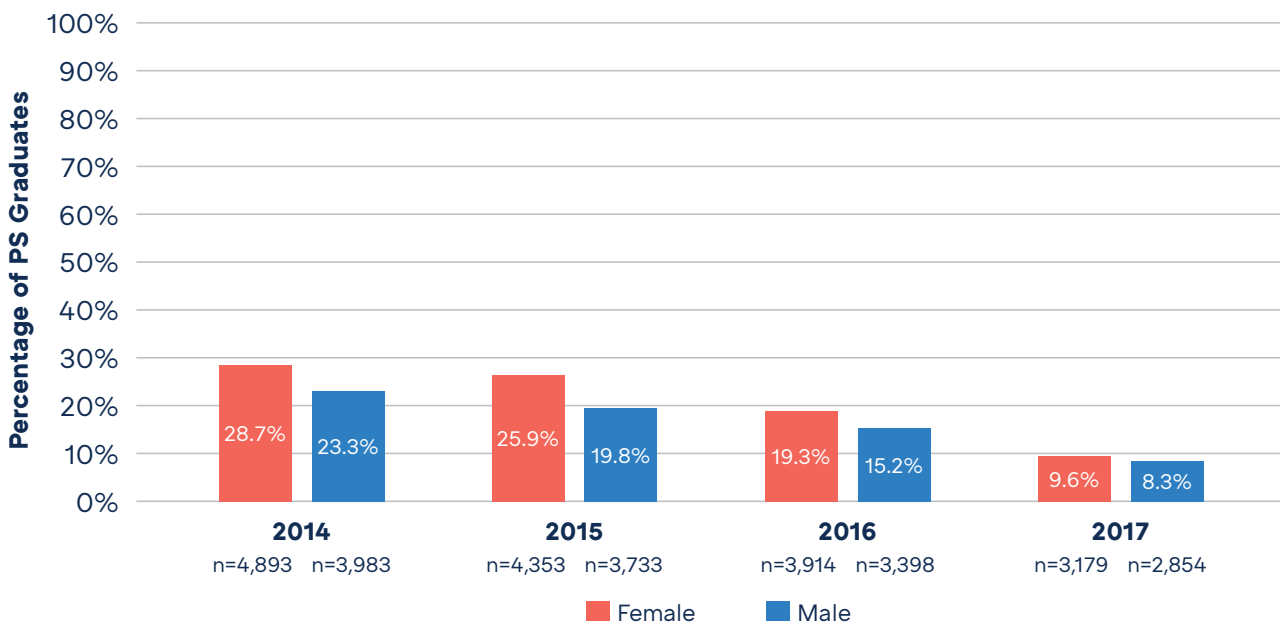


Completed a Vertical Transfer and Gender

In each cohort, the majority of female and male post-secondary graduates from 2-year institutions did not graduate from a 4-year institution by December of 2021. For the 2014 and 2015 cohorts, 20–29% of both male and female graduates completed a vertical transfer by then graduating from a 4-year institution, while 8–19% of the 2016 and 2017 cohorts did.

Most notably, in each cohort, the rate at which male 2-year graduates subsequently graduated from a 4-year institution is notably lower than that of both female 2-year graduates and the overall average. Figure 17 illustrates that in each cohort, female 2-year institution graduates consistently had higher rates of completing a vertical transfer by graduating from a 4-year institution than their male counterparts and the overall average.

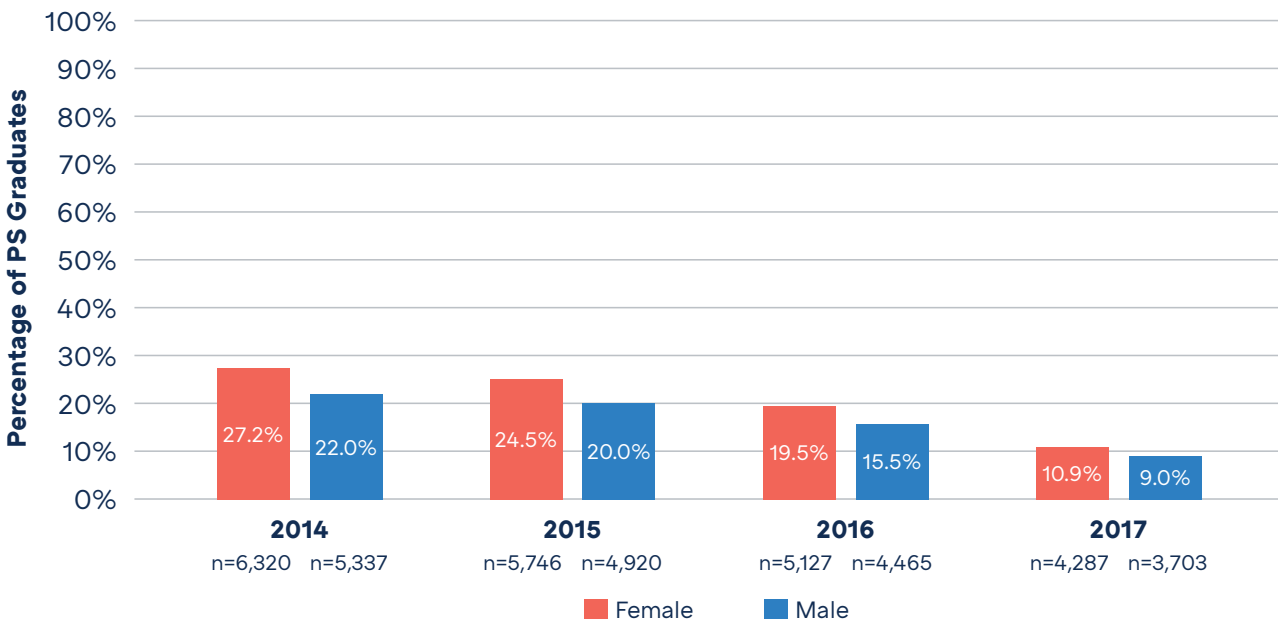
FIGURE 17. Completed a Vertical Transfer: 2YR to 4YR Through December of 2021 by Gender



2YR-4YR Completed Totals as Reported in Figure 16: 26.3%; 23.1%; 17.4%; 9.0%

Similarly, in each cohort, the majority of female and male post-secondary graduates who earned an associate’s degree or below did not subsequently earn a bachelor’s degree by December of 2021. About 20–27% of male and female earners of an associate’s degree or below in the 2014 and 2015 cohorts completed a vertical transfer by then earning a bachelor’s degree, while less than 20% of females or males in the 2016 and 2017 cohorts did. Consistent with the first measure of completing a 4-year vertical transfer, Figure 18 indicates that male earners of an associate’s degree or below in each cohort had lower rates of subsequently earning a bachelor’s degree than women and the overall average.

FIGURE 18. Completed a Vertical Transfer: AD to BD Through December of 2021 by Gender

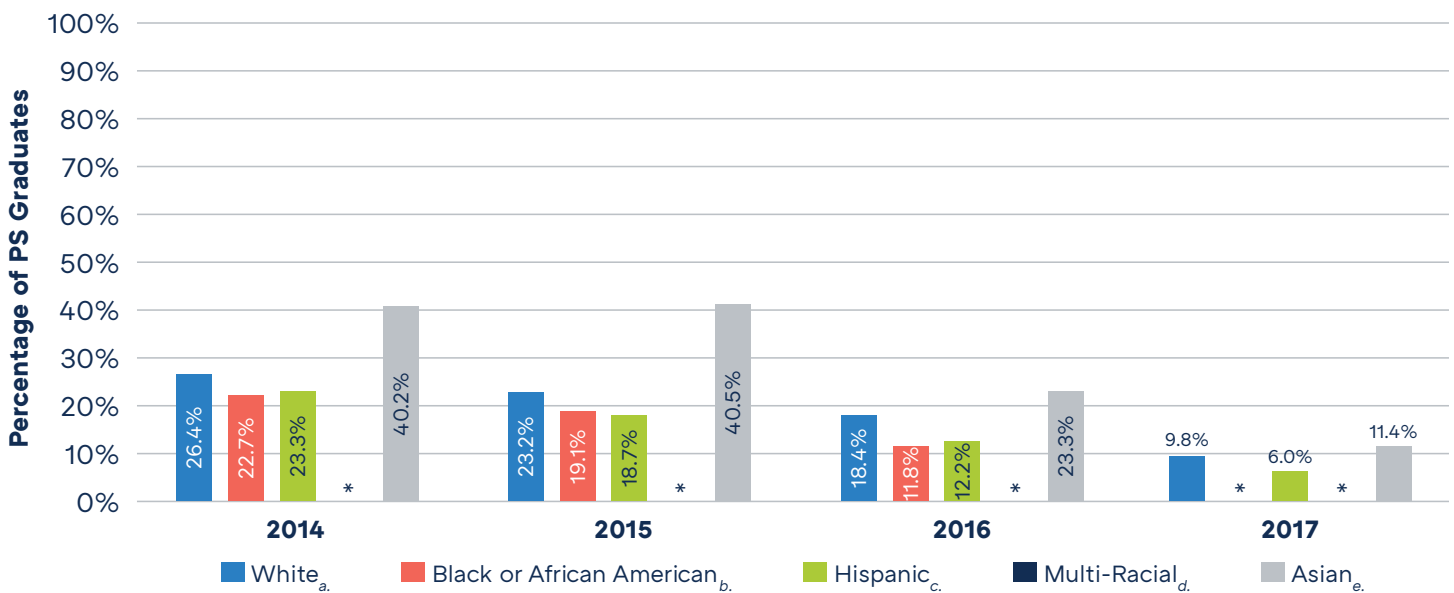


AD-BD Completed Totals as Reported in Figure 16: 24.8%; 22.4%; 17.6%; 10.0%

Completed a Vertical Transfer and Race/Ethnicity

Across cohorts, the majority of White, Black or African American, Hispanic and Asian post-secondary graduates from 2-year institutions did not complete a vertical transfer by subsequently graduating from a 4-year institution by December of 2021. Additionally, across all four cohorts, the number of Multi-racial 2-year institution graduates who completed a 4-year vertical transfer was too low to report. Figure 19 shows that the rate at which Asian 2-year institution graduates in each cohort completed a vertical transfer (11-41%) was notably higher than those of other racial/ethnic groups. The rate of White post-secondary 2-year institution graduates who completed a 4-year vertical transfer was comparable to the overall average of each cohort. Finally, Figure 19 also shows that Black or African American and Hispanic 2-year institution graduates in each cohort completed vertical transfers at rates consistently lower than Asian and White graduates.

FIGURE 19. Completed a Vertical Transfer: 2YR to 4YR Through December of 2021 by Race/Ethnicity



2YR-4YR Completed Totals as Reported in Figure 16: 26.3%; 23.1%; 17.4%; 9.0%

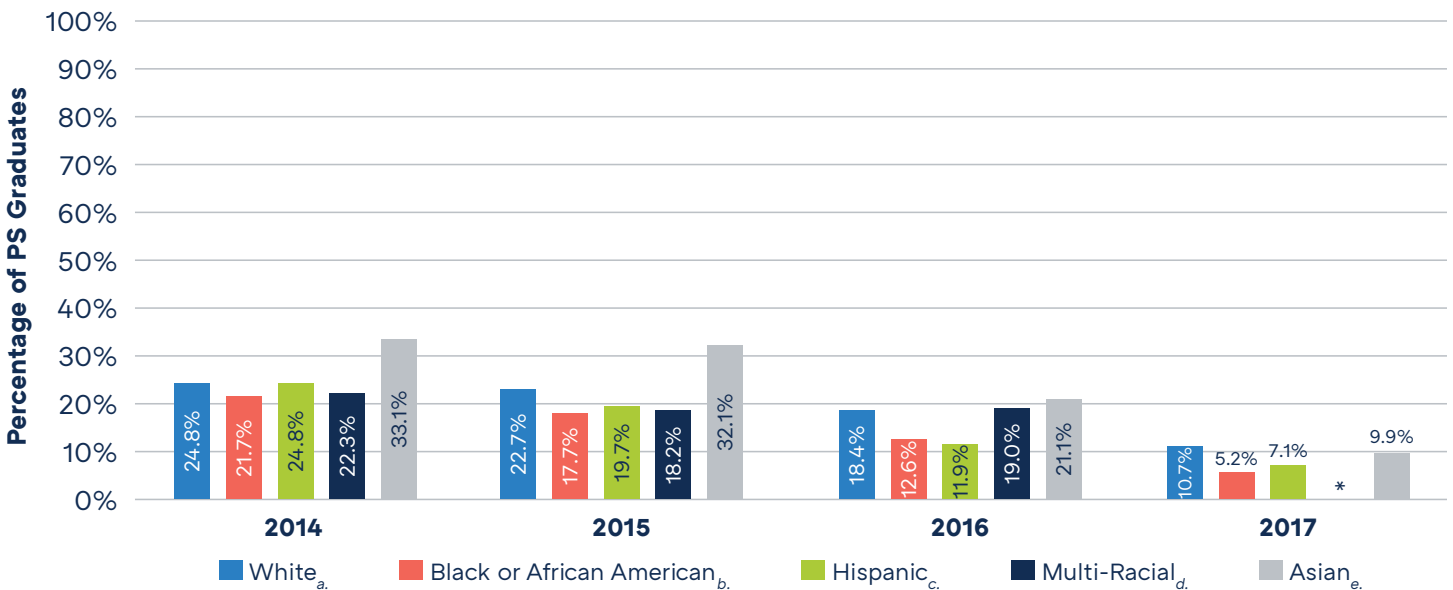
*Counts Too Low to Report

a. n=6,910; n=6,208; n=5,496; n=4,652; b. n=852; n=817; n=761; n=508;

c. n=677; n=638; n=641; n=548; d. n=106; n=89; n=108; n=100; e. n=316; n=316; n=287; n=211

Comparable to the 4-year vertical transfer outcomes described above, the majority of post-secondary graduates of any racial/ethnic group who earned an associate’s degree or below did not subsequently earn a bachelor’s degree by December of 2021. Asian earners of an associate’s degree or below in the 2014–2016 cohorts completed vertical transfers at much higher rates than the overall average. Figure 20 shows that across cohorts, White, Hispanic, and Multi-racial graduates’ rates of completing a vertical transfer fluctuated, but generally were comparable to the overall averages. Interestingly, in the 2017 cohort, a slightly higher percentage of White students who earned an associate’s degree or below completed a vertical transfer compared to Asian graduates. Further, Black or African American earners of an associate’s degree or below completed a bachelor’s degree vertical transfer at lower rates than the overall average.

FIGURE 20. Completed a Vertical Transfer: AD to BD Through December of 2021 by Race/Ethnicity



AD-BD Completed Totals as Reported in Figure 16: 24.8%; 22.4%; 17.6%; 10.0%

* Counts Too Low to Report

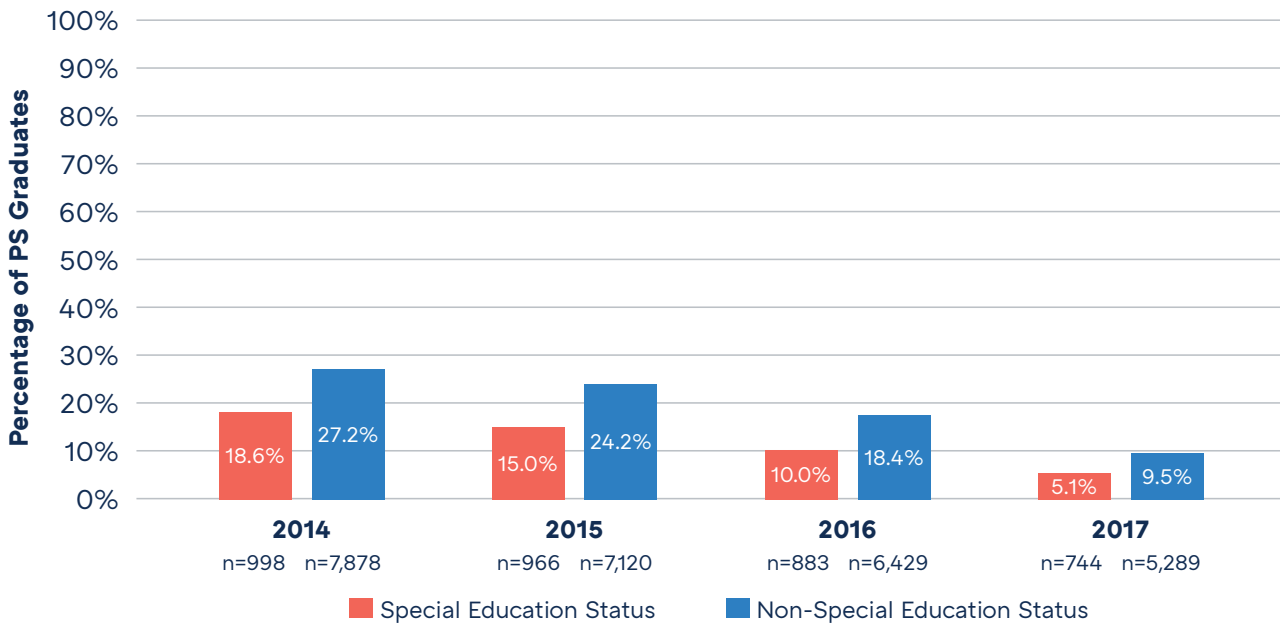
a. n=9,315; n=8,438; n=7,473; n=6,358; b. n=987; n=910; n=820; n=561;

c. n=781; n=732; n=720; n=609; d. n=130; n=121; n=137; n=120; e. n=426; n=442; n=418; n=322

Completed a Vertical Transfer and Special Education Status

Figure 21 highlights that compared to non-Special Education Status graduates and the overall average for each cohort, the percentages of previous Special Education Status 2-year institution graduates who completed a vertical transfer by graduating from a 4-year institution were notably lower. For post-secondary graduates from 2-year institutions who were Special Education Status at the time of their high school graduation, the majority of each cohort did not complete a vertical transfer by graduating from a 4-year institution by December of 2021. Ten to fifteen percent of previously Special Education Status graduates in the 2014–2016 cohorts completed a vertical transfer, and 5% in the 2017 cohort did. Beginning with the 2014 cohort, the percentage of previously Special Education Status graduates of 2-year institutions who subsequently graduated from a 4-year institution steadily decreased in each cohort.

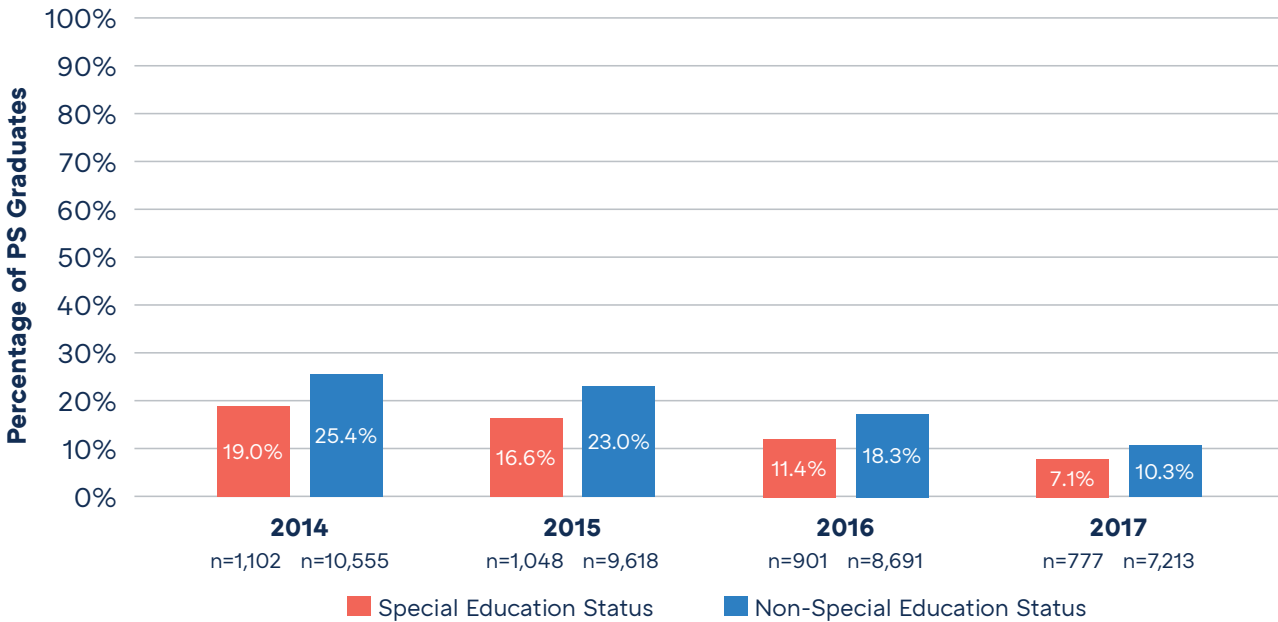
FIGURE 21. Completed a Vertical Transfer: 2YR to 4YR Through December of 2021 by Special Education Status



2YR-4YR Completed Totals as Reported in Figure 16: 26.3%; 23.1%; 17.4%; 9.0%

Figure 22 shows that compared to non-Special Education Status graduates and the overall average for each cohort, the percentages of previously Special Education Status associate's degree or below earners who completed a vertical transfer were notably lower. Less than 20% of previously Special Education Status associate's degree or below earners in each cohort completed a vertical transfer.

FIGURE 22. Completed a Vertical Transfer: AD to BD Through December of 2021 by Special Education Status

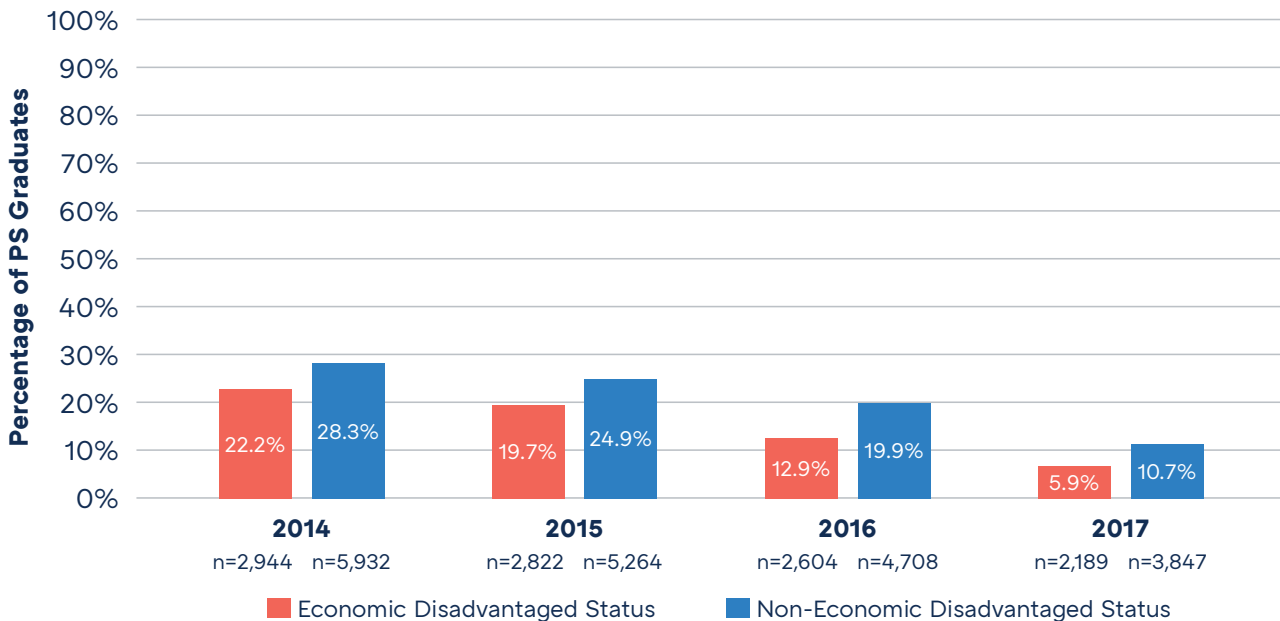


AD-BD Completed Totals as Reported in Figure 16: 24.8%; 22.4%; 17.6%; 10.0%

Completed a Vertical Transfer and Economic Disadvantaged Status

Although the rate of completing a vertical transfer was low regardless of Economic Disadvantage Status, Economic Disadvantaged Status graduates' rates were consistently lower than the overall average for each cohort and non-Economic Disadvantaged Status graduates. Consistent with the overall trend, the majority of post-secondary graduates from 2-year institutions who were Economic Disadvantaged Status at the time of their high school graduation did not complete a vertical transfer by graduating from a 4-year institution by December of 2021. Specifically, 13–22% of 2-year institution graduates in the 2014–2016 cohorts who were previously Economic Disadvantaged Status completed a vertical transfer and 6% in the 2017 cohort did. In fact, Figure 23 illustrates that starting with the 2014 cohort, the percentage of previously Economic Disadvantaged Status 2-year institution graduates who then graduated from a 4-year institution decreased gradually in each cohort.

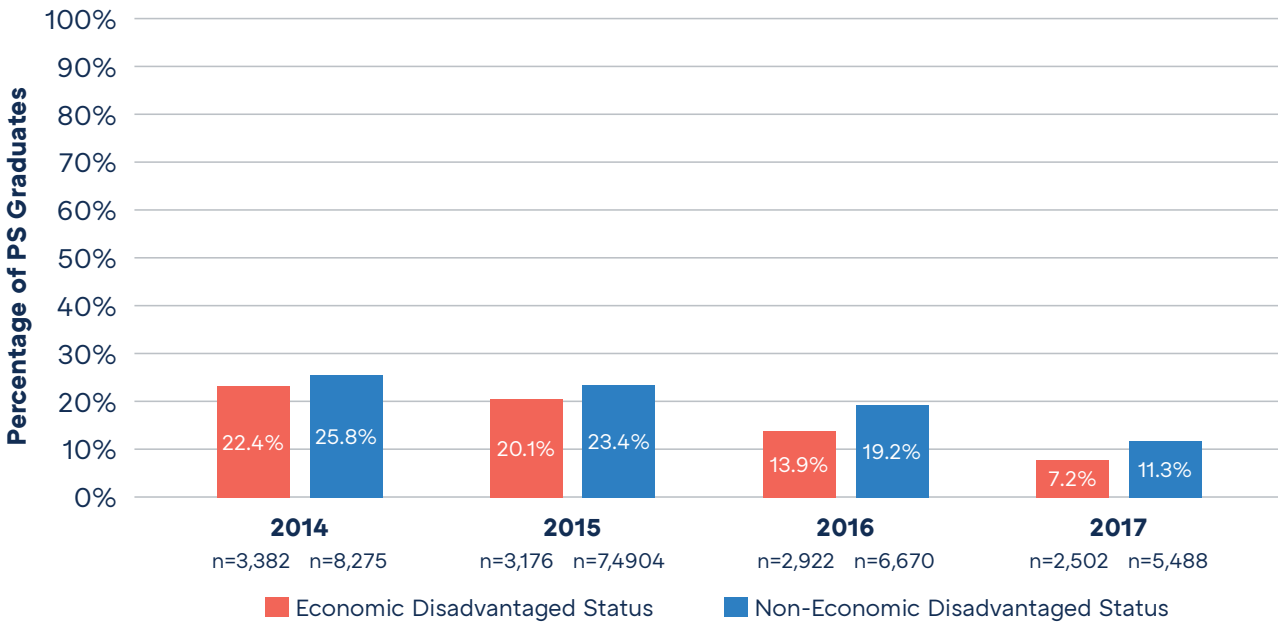
FIGURE 23. Completed a Vertical Transfer: 2YR to 4YR Through December of 2021 by Economic Disadvantage Status



2YR-4YR Completed Totals as Reported in Figure 16: 26.3%; 23.1%; 17.4%; 9.0%

Regardless of Economic Disadvantage Status, the majority of associate’s degree or below earners in each cohort did not complete a vertical transfer by earning a bachelor’s degree by December of 2021. However, Figure 24 shows that in each cohort the rate at which previously Economic Disadvantaged Status associate’s degree or below earners completed a vertical transfer was lower than that of non-Economic Disadvantaged students and the overall average. In the 2014–2016 cohorts 14–22% of previously Economic Disadvantaged Status associate’s degree or below earners completed a vertical transfer and 7% in the 2017 cohort did.

FIGURE 24. Completed a Vertical Transfer: AD to BD Through December of 2021 by Economic Disadvantaged Status

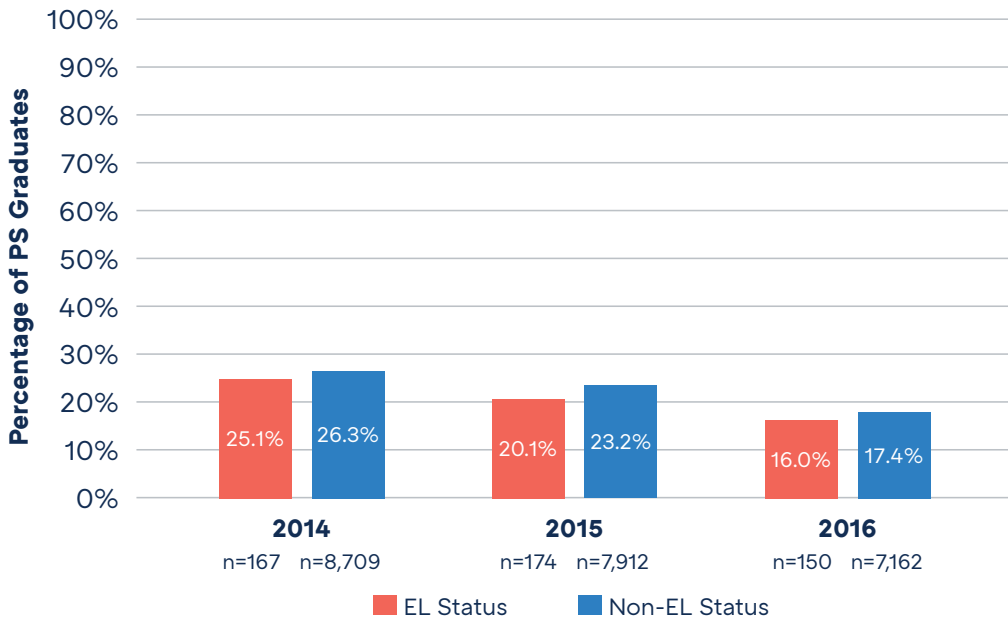


AD-BD Completed Totals as Reported in Figure 16: 24.8%; 22.4%; 17.6%; 10.0%

Completed a Vertical Transfer and EL Status

Figure 25 indicates that for the 2014–2016 cohorts, the rate of previously EL Status 2-year institution graduates who completed a vertical transfer by then graduating from a 4-year institution was only slightly lower than the rate of non-EL Status graduates. Specifically, 16–25% of previously EL Status 2-year post-secondary graduates subsequently graduated from a 4-year institution, compared to 17–26% of non-EL Status students. For the 2017 cohort, the number of 2-year institution graduates who were previously EL Status was too low to report.

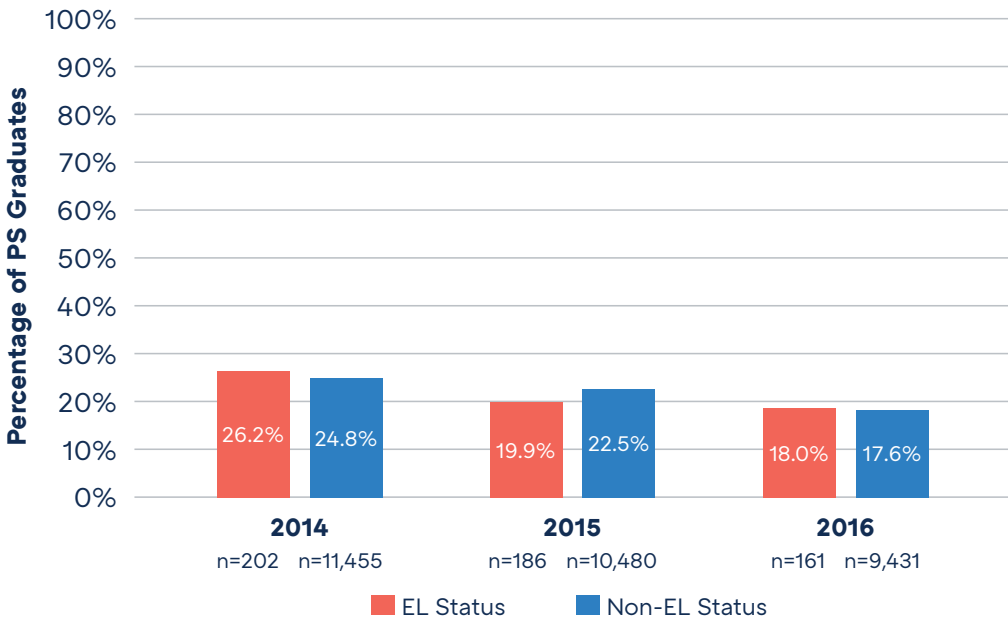
FIGURE 25. Completed a Vertical Transfer: 2YR to 4YR Through December of 2021 by EL Status



2YR-4YR Completed Totals as Reported in Figure 16: 26.3%; 23.1%; 17.4%; 9.0%

Figure 26 shows that the rate at which previously EL Status associate’s degree and undergraduate certificate earners in the 2014 cohort completed a vertical transfer was comparable to the rates for non-EL Status graduates and the overall average. Although the percentages fluctuate slightly, the differences across cohorts are minimal. For associate’s degree and undergraduate certificate earners the majority in each cohort did not complete a vertical transfer by earning a bachelor’s degree by December of 2021, regardless of EL Status. Again, the number of previously EL Status associate’s degree and undergraduate certificate earners in the 2017 cohort was too low to report.

FIGURE 26. Completed a Vertical Transfer: AD to BD Through December of 2021 by EL Status

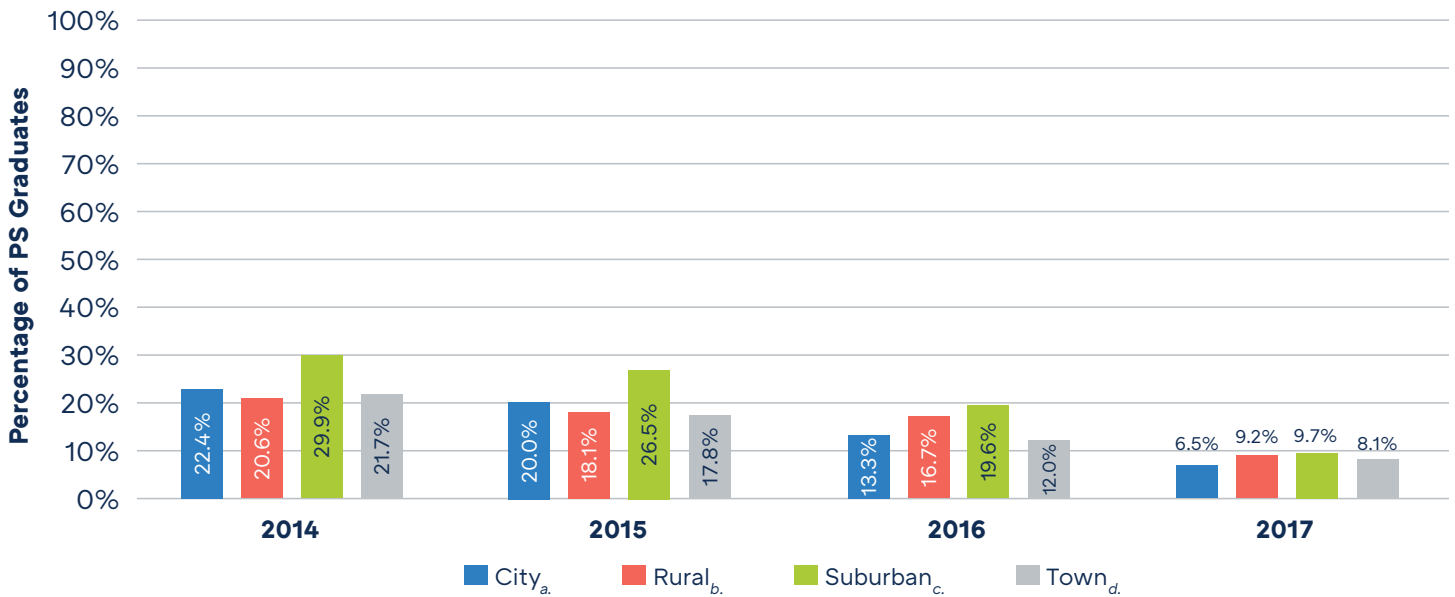


AD-BD Completed Totals as Reported in Figure 16: 24.8%; 22.4%; 17.6%; 10.0%

Completed a Vertical Transfer and Geographic Region

Across all four cohorts, the majority of post-secondary 2-year institution graduates from each geographic region did not complete a vertical transfer by then graduating from a 4-year institution by December of 2021. Specifically, Figure 27 shows that the percentages of 2-year institution graduates from cities and towns who completed a vertical transfer were consistently lower than the overall average of each cohort. Further, for 2-year institution graduates from rural high schools in the 2014 and 2015 cohorts, the rate of completing a vertical transfer was slightly lower than the overall average, while for the 2016 and 2017 cohorts, the rates were comparable to the average. However, 2-year institution graduates from suburban areas completed a vertical transfer at rates consistently higher than those of other geographic regions.

FIGURE 27. Completed a Vertical Transfer - 2YR to 4YR Through December of 2021 by Geographic Region



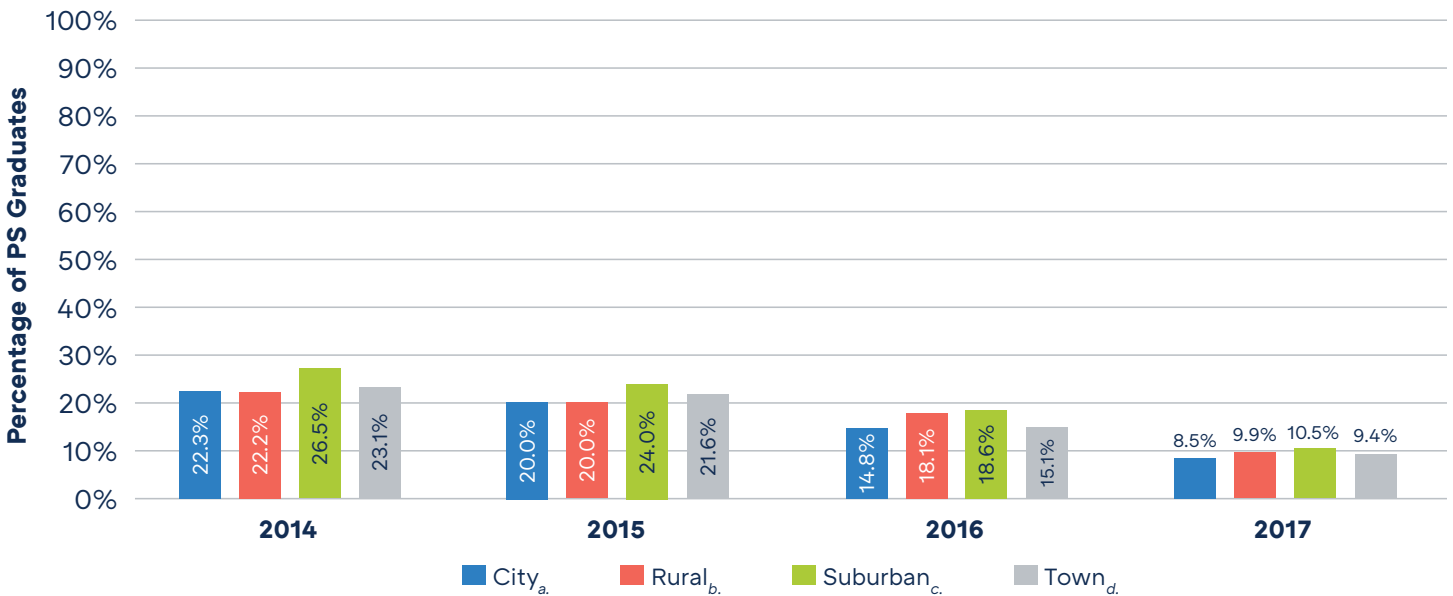
2YR-4YR Completed Totals as Reported in Figure 16: 26.3%; 23.1%; 17.4%; 9.0%

a. n=1,355; n=1,318; n=1,200; n=947; b. n=1,663; n=1,499; n=1,302; n=1,205;

c. n=5,101; n=4,567; n=4,184; n=3,362; d. n=757; n=702; n=626; n=519

Similarly, in each cohort, the majority of associate’s degree and undergraduate certificate earners who previously graduated from each geographic region did not complete a vertical transfer by then earning a bachelor’s degree by December of 2021. Overall, Figure 28 shows that for associate’s degree and undergraduate certificate earners from cities and towns, the rate of completing a vertical transfer was consistently slightly lower than the overall average in each cohort. Associate’s degree or below earners from rural high schools completed a bachelor’s degree vertical transfer at rates slightly lower than or equal to the overall average. However, for associate’s degree or below earners from suburban areas, the rate of completing a vertical transfer was consistently slightly higher than those of other geographic regions.

FIGURE 28. Completed a Vertical Transfer – AD to BD Through December of 2021 by Geographic Region



AD-BD Completed Totals as Reported in Figure 16: 24.8%; 22.4%; 17.6%; 10.0%

a. n=1,607; n=1,520; n=1,385; n=1,114 b. n=2,236; n=2,093; n=1,767; n=1,558
 c. n=6,743; n=6,084; n=5,509; n=4,572; d. n=1,071; n=969; n=931; n=746

■ IS CREDENTIAL EARNING DIFFERENT BY SECTOR (2-YEAR/4-YEAR OR PUBLIC/PRIVATE)?

Figure 29 shows that the majority of those who initially enrolled in a 2-year institution did not earn a credential of any kind by December of 2021, only 23-33% did. However, 52-72% of those who initially enrolled in a 4-year institution earned a credential by December of 2021. Further, Figure 30 indicates that of those who initially started at a 2-year institution and went on to earn a degree, the majority (55-82%) earned an associate’s degree or below as their highest degree earned. Across cohorts, about 95% of degree earners who started at a 4-year institution earned a bachelor’s degree or above as their highest degree by December of 2021. Overall, those who started their post-secondary career by enrolling in a 4-year institution had higher rates of degree attainment, both in completing a degree and the highest degree earned, than those who initially began at a 2-year institution.

FIGURE 29. Credential Earning Through December of 2021 by 2-YEAR/4-YEAR Initial Enrollment

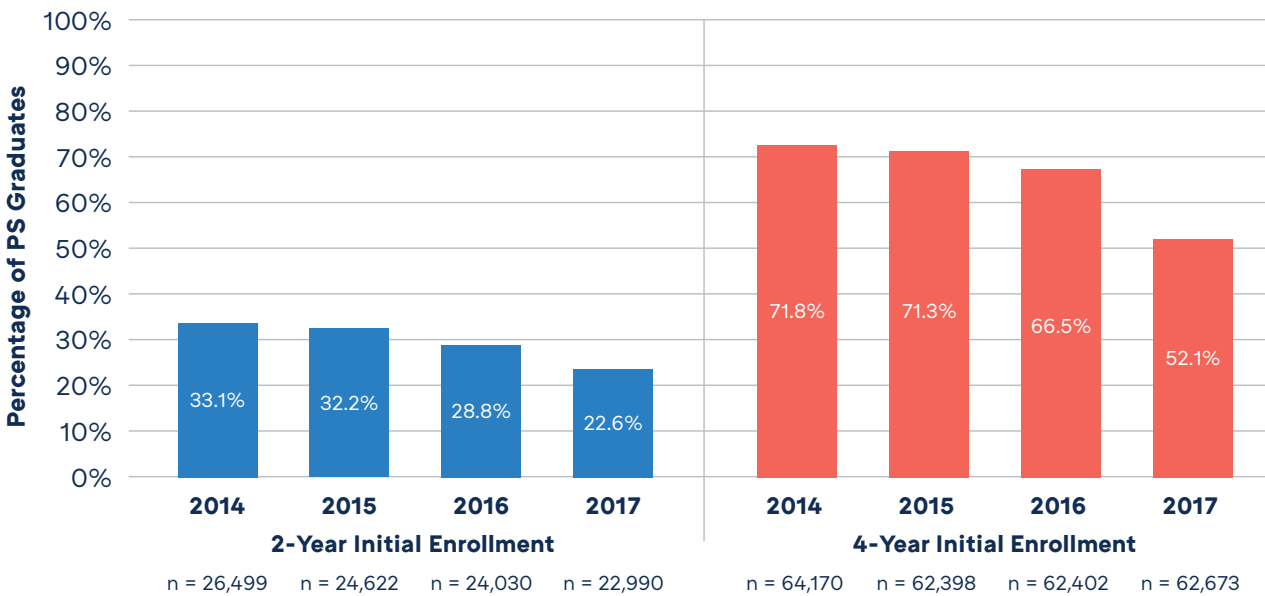
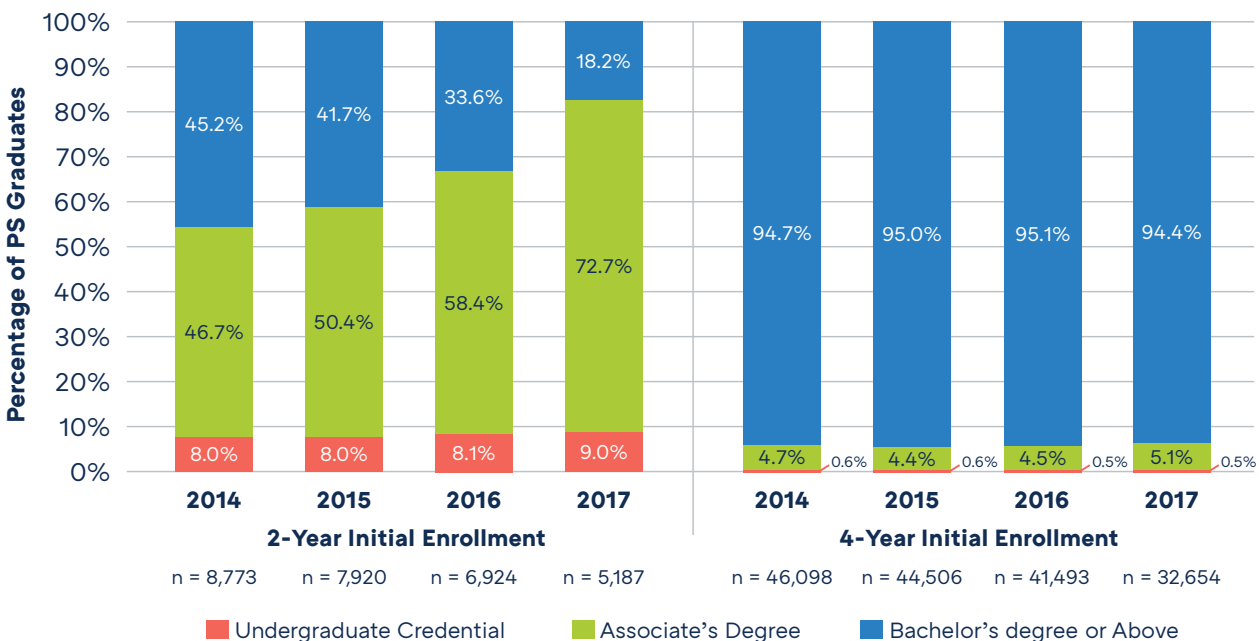


FIGURE 30. Highest Degree Earned by December of 2021 by 2-YEAR/4-YEAR Initial Enrollment



Overall, those who initially enrolled in a private institution had slightly higher rates of educational attainment, both in completing a degree and the highest degree earned, than those who started at a public institution. Figure 31 shows that the majority of students who initially enrolled in a private institution earned a credential by December of 2021 (52–69%) and 92% of the students who earned a credential earned a bachelor’s degree or above as their highest degree (see Figure 32). Although high percentages of students earned a credential of any kind by December of 2021, the rates were slightly lower for students who initially enrolled in a public institution (41–58%) compared to a private institution (52–69%). Figure 32 shows that of students who initially enrolled in a public institution and earned a credential by December of 2021, 80–85% earned a bachelors’ degree or above as their highest degree compared to 92% for students who initially enrolled in private institutions.

FIGURE 31. Credential Earning Through December of 2021 by Public/Private Initial Enrollment

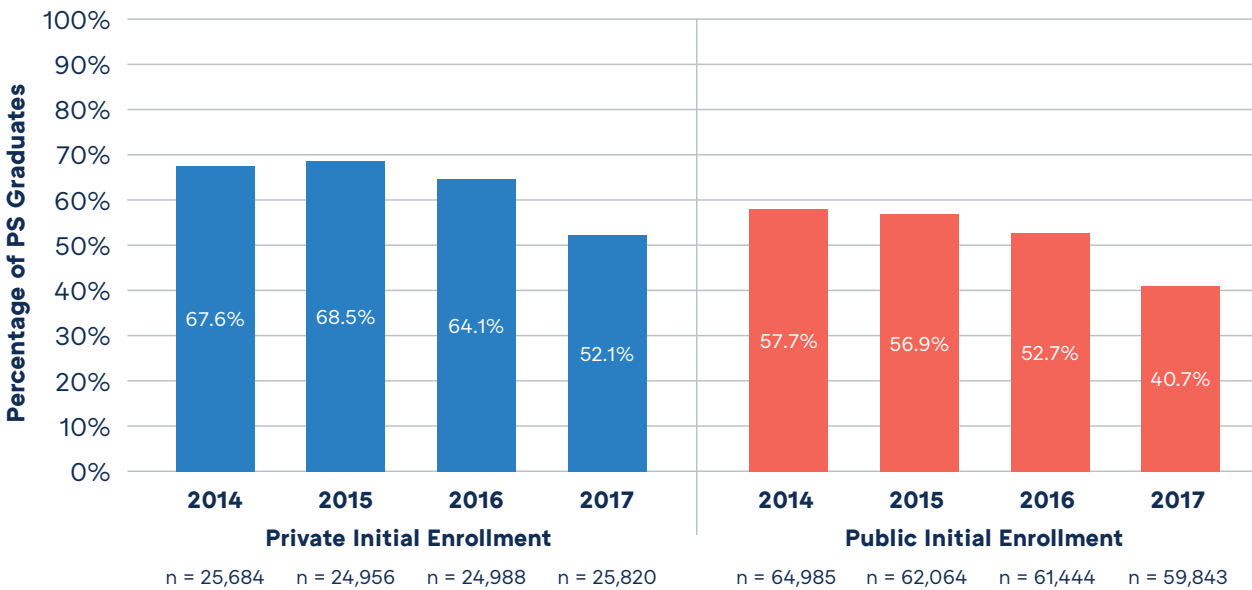
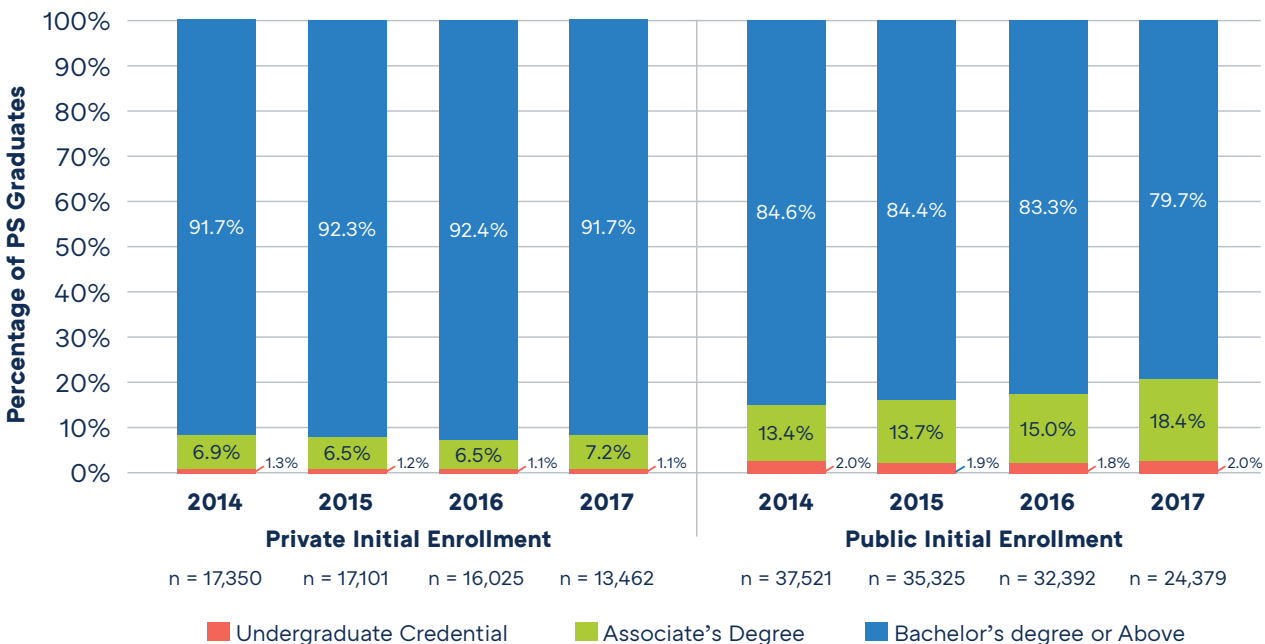


FIGURE 32. Highest Degree Earned by December of 2021 by Public/Private Initial Enrollment



Discussion of Results and Conclusions

Several key findings emerged in the exploration of rates of degree attainment and transfers to baccalaureate programs for four cohorts of high school graduates who subsequently earned a post-secondary degree/credential. The majority of post-secondary graduates earned one credential by December of 2021, with the 2014 and 2015 cohorts having the highest percentages of earning multiple credentials (25.8% and 21.6%, respectively). In terms of highest degree earned, the majority of post-secondary graduates in each cohort earned a bachelor's degree or above as their highest degree by December of 2021. Although the majority of the 2017 cohort had earned a bachelor's degree or above, compared to the other cohorts they had the lowest rate and had a slightly higher rate of earning an associate's degree as highest degree earned. As noted throughout the report, this is likely due to the December 2021 cut-off date being only 4.5 years after the 2017 graduates' high school graduation. These graduates' post-secondary enrollment and persistence were also likely impacted by the Covid-19 Pandemic.

The majority of post-secondary 2-year institution graduates in each cohort did not initiate a vertical transfer by enrolling in a 4-year institution, but approximately 30% of each cohort did. The latter cohorts (2015, 2016, and 2017) had slightly higher rates of initiating a vertical transfer (33.0%; 33.2%; 32.3%) compared to the 2014 cohort (29.4%). The earlier cohorts, (2014 and 2015), had higher rates of completing a vertical transfer, by either measure, compared to the 2016 and 2017 cohorts. Although, this is unsurprising as the December 2021 cut-off date is 7.5 and 6.5 years after the 2014 and 2015 cohorts graduated high school (respectively), allowing more time to complete the transfer.

Gender

At least 84% of both male and female post-secondary graduates in each cohort earned a bachelor's degree or above as their highest degree by December of 2021. However, female post-secondary graduates had slightly higher rates of earning a bachelor's degree or above as their highest degree across cohorts compared to male post-secondary graduates (86–88% vs 81–86%). Further, while the majority of each cohort did not initiate a vertical transfer by December of 2021, the rate of female 2-year institution graduates who initiated a vertical transfer (32–37%) was slightly higher than that of males in each cohort (26–30%). Female post-secondary graduates also completed vertical transfers, by both measures, at slightly higher rates than males. These findings are consistent with a trend over the last decade of women generally reaching higher levels of degree attainment (National Center for Education Statistics, 2022a), and more recent findings of women having shorter average time to degree completion than their male counterparts (Velez et al., 2019). Additionally, regarding vertical transfers, the findings of this study were consistent with those of Shapiro et al. (2017) who found that women have higher rates of transferring out of 2-year institutions (with or without earning a credential) than their male counterparts.

Although the majority of the 2017 cohort had earned a bachelor's degree or above, compared to the other cohorts they had the lowest rate. This is likely due to the December 2021 cut-off date being only 4.5 years after the 2017 graduates' high school graduation.

Special Education Status at High School Graduation

While the majority of post-secondary graduates who were Special Education Status at the time of their high school graduation earned a bachelor's degree or above as their highest degree earned by December of 2021 (51–64%), compared to non-Special Education Status graduates (85–88%) the rate was much lower. Previously Special Education Status graduates in this study also had significantly higher rates of earning an associate's degree (29–41%) as their highest degree compared to non-Special Education Status graduates across cohorts (11–13%). Further, compared to their counterparts, across cohorts, Special Education Status graduates had much lower rates of both initiating and completing a vertical transfer (either measure).

Economic Disadvantaged Status at High School Graduation

The majority of post-secondary graduates who were Economic Disadvantaged Status at the time of their high school graduation earned a bachelor's degree or above as their highest degree by December of 2021 (71–76%), but across cohorts, the rates were lower than the rates of non-Economic Disadvantaged Status graduates (87–90%). Conversely, the percentages of previously Economic Disadvantaged Status graduates in each cohort who earned an associate's degree (20–26%) as their highest degree were higher compared to non-Economic Disadvantaged Status graduates (9–12%). Although the rates of initiating a vertical transfer for previously Economic Disadvantaged Status graduates (29–33%) were comparable to those of non-Economic Disadvantaged Status graduates in each cohort, the rates of completing a vertical transfer, by either measure, were slightly lower.

EL Status at High School Graduation

About half of post-secondary graduates who were EL Status at the time of their high school graduation in the 2014–2016 cohorts earned a bachelor's degree or above as their highest degree by December of 2021, however, these rates were significantly lower than non-EL Status graduates (84–87%). Although unsurprising within the context provided throughout this report, only 38% of previously EL-Status graduates in the 2017 cohort had earned a bachelor's degree or above as their highest degree as of December of 2021. Interestingly, previously EL Status graduates in the 2014, 2015, and 2016 cohorts initiated vertical transfers at rates significantly higher than non-EL Status graduates, while for the 2017 cohort, the rate was comparable to the average. Finally, the rates at which previously EL Status graduates in the 2014, 2015, and 2016 cohorts completed either measure of a vertical transfer was comparable to the average rate of each cohort. The higher rates of earning an associate's degree and initiating vertical transfers may indicate that previously EL Status graduates in PA are pursuing vertical transfer pathways to bachelor's degree attainment at higher rates than their counterparts. Although EL Status students may be initiating vertical transfers at a higher rate than non-EL status students, the rates of completing either measure of vertical transfer were comparable between student groups.

The higher rates of earning an associate's degree and initiating vertical transfers may indicate that previously EL Status graduates in PA are pursuing vertical transfer pathways to bachelor's degree attainment at higher rates than their counterparts.

Race/Ethnicity

Across all cohorts, a majority of post-secondary graduates earned a bachelor's degree or above as their highest degree by December of 2021, regardless of race/ethnicity. Asian post-secondary graduates consistently had the highest rates of earning a bachelor's degree or above as their highest degree as well as initiating and completing a vertical transfer by December of 2021. Such findings are consistent with previous findings of Asian students having higher post-secondary educational attainment outcomes than students of other racial/ethnic backgrounds (Espinosa et al., 2019; National Center for Education Statistics, 2022a). White graduates achieved each outcome at rates consistent with the overall averages. Further, Black or African American, Hispanic, and Multi-Racial graduates all had lower than average rates of earning a bachelor's degree or above as their highest degree, and rates of initiating a vertical transfer that were consistent with the overall average. However, with regards to completing vertical transfers by either measure, the rates for these student groups were consistently lower. Previous literature indicates a national trend of Black or African American, Hispanic, and Multi-racial graduates taking longer to earn a bachelor's degree, on average, than students of other racial/ethnic backgrounds (Velez et al., 2019). The findings of this study, when examined with the findings of Velez et al. (2019), may indicate that in PA, Black or African American, Hispanic, and Multi-racial post-

secondary students are potentially utilizing vertical pathways, thus taking longer to reach bachelor's degree attainment. Future research in PA could more closely examine this trend.

Geographic Region

While the majority of graduates from each geographic region earned a bachelor's degree or above as their highest degree by December of 2021 (77%+), post-secondary graduates from suburban high schools consistently had the highest rates of earning a bachelor's degree or above as their highest degree (87–89%). Further, post-secondary graduates from cities consistently had the highest rates of earning an associate's degree as their highest degree (15–21%), compared to other regions. Greater percentages of suburban graduates initiated and completed vertical transfers, indicating that in PA, suburban graduates had greater overall educational outcomes compared to graduates of other geographic regions. Post-secondary graduates from urban and rural high schools initiated and completed vertical transfers at rates comparable to or lower than the overall average, while graduates from towns consistently had lower than average rates of initiating and completing vertical transfers.

Is credential earning different by sector?

In this study, PA high school graduates who started their post-secondary career by enrolling in a 4-year institution had higher rates of degree attainment, both in degree completion and highest degree earned, than those who initially began at a 2-year institution. Only 23–33% of students who initially enrolled in a 2-year institution earned a credential of any kind by December of 2021, compared to a majority of students who initially enrolled in a 4-year institution (52–72%). Further, although the majority of students who initially enrolled at a 2-year institution and graduated earned an associate's degree or below (47–73%), a significant portion also went on to earn a bachelor's degree or above. The vast majority (95%) of degree earners who started at a 4-year institution earned a bachelor's degree or above as their highest degree.

This study also found that PA high school graduates who initially enrolled in a private institution had slightly higher rates of educational attainment than those who started at a public institution. Approximately 52–69% of those who started at a private institution earned a credential of any kind by December of 2021 and of those who did earn a credential, 92% earned a bachelor's degree or above as their highest degree. Lower rates of those who started at a public institution earned a credential of any kind (41–58%). High rates of those who initially enrolled in a public institution earned a bachelors' degree or above as their highest degree (80–85%) but compared to those who began at a private institution, the rate was slightly lower.

Conclusion

Today, navigating higher education can look much different than it has in the past. Across the nation, rates of overall educational attainment have been increasing (De Brey et al., 2021; Espinosa et al., 2019), and students are choosing various pathways to achieve their desired post-secondary outcomes. Additionally, today's post-secondary students continue to be affected by the Covid-19 pandemic, which not only disrupted in-person learning, but impacted rates of persistence, enrollment (National Student Clearinghouse, 2021) and vertical transfers (Causey et al., 2022). Overall, this study presented descriptive findings to identify some pathways to degree attainment for different student groups in PA. Future research should continue to examine the post-secondary pathways of recent high school graduates in this current landscape of higher education.

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Appendix

TABLE 1. Cohorts by Highest Degree Earned

	2014	2015	2016	2017
Total # of Degree Earners	100.0 (54,871)	100.0 (52,426)	100.0 (48,417)	100.0 (37,841)
Undergraduate Credential	1.8 (987)	1.7 (875)	1.5 (748)	1.7 (627)
Associate's Degree	11.4 (6,244)	11.4 (5,953)	12.2 (5,889)	14.4 (5,450)
Bachelor's Degree or Post-Bach Certificate	74.5 (40,903)	78.6 (41,196)	82.2 (39,802)	83.4 (31,560)
Master's Degree/Doctorate	12.3 (6,737)	8.4 (4,402)	4.1 (1,973)	0.5 (204)

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- ECE Early Childhood Education
- K12 K-12 Education
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