

IOWA COMMUNITY COLLEGE COMPLETERS AND LEAVERS

A COMPARATIVE ANALYSIS

March
2019



**COMMUNITY COLLEGES &
WORKFORCE PREPARATION**
PROSPERITY THROUGH EDUCATION
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Iowa Community College Completers and Leavers: A Comparative Analysis

A statewide analysis of the impact of accumulated credit hours, program of study, and the industry of employment on success in the workforce for Iowa community college students who completed or left their community college program within academic year 2015-2016 (AY15-16).

Prepared by

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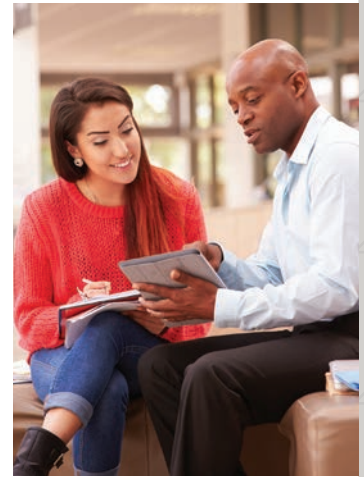


**COMMUNITY COLLEGES &
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TABLE OF CONTENTS

Introduction	1
<i>Defining Completers and Leavers</i>	3
<i>What to Find in this Report</i>	4
I. Distribution of Cohorts and Sub-Cohorts.	5
II. Profiles of Completers and Leavers	6
III. Time to Exit and Educational Value Upon Exit.	9
IV. In- and Out-of-State Transfers	12
V. Career Clusters of Completers and Leavers.	14
VI. Program of Study of Leavers	16
VII. Post-Exit Employment and Wages	20
VIII. Employment Rates, Wages by Demographics	24
IX. Employment Rates, Wages by Career Cluster	25
X. Wages by Program of Study (POS)	27
XI. Industry of Employment Related to POS	31
Conclusion	35
Methods	36
References	38



INTRODUCTION

Traditionally, the standard measure of student success has been the successful completion of a program of study (POS) within a prescribed amount of time. Specifically, the more students who complete the program they started, the better *graduation rate*, which is a key indicator of student success.

Graduation (especially, timely graduation) is considered the pinnacle of the educational experience with the notion that, upon graduation, a former student becomes a working professional earning a living wage. However, graduation rates published by the National Center for Education Statistics (NCES) only take into account first-time, full-time, degree-seeking undergraduates who complete their POS within 150 percent of the normal time. While this success measure captured the majority of Iowa community college students during the first decade of the college system (1965-1974) when nearly 85 percent of all students were enrolled full-time (at least 24 semester hours per year), that is no longer the case.

Over the past decade (2009-2018), the enrollment patterns of students at Iowa's community colleges have reversed. Today, over two-thirds (67.8 percent) of these students are enrolled on a part-time basis. This development has called for broadening definitions and expanding performance measures to better reflect student success and institutional effectiveness.

In addition to traditional graduation rates, researchers have introduced retention and transfer rates, as well as workforce outcomes as alternative indicators of student success. Retention rates, which measure the percent of students who return to the same institution the following year, are a measure of persistence and incremental success. Transfer rates, which measure the percent of community college students who transfer to a four-year college or university within the 150 percent of the normal time, recognize the successful transition of students from lower to upper division studies. The utilization of the National Student Clearinghouse (NSC) has facilitated the exchange of this data, which previously could only be captured through alumni surveys or local data exchange agreements.

Another measure of student success is how well they do upon entering the workforce. Historically, capturing the employment and earnings of graduates and non-graduates was cumbersome and primarily relied on alumni surveys. However, over the last decade, researchers have entered into comprehensive data exchange agreements that involve NSC for postsecondary enrollment and graduation data transfer and workforce development agencies that utilize Unemployment Insurance (UI) records to more accurately explore alumni employment and wage earnings.

Now that it is more feasible to follow students into the workforce, it is important to examine the outcomes of college leavers, as well as completers, to better understand the impact of varying levels of education on students' workforce success. This is particularly important, due in part, to the differing opinions on what constitutes educational success, and what level of education is necessary for entry-level employment.

The U.S. Bureau of Labor Statistics (BLS) research on employment trends¹ found that high school diplomas remain the most common entry-level requirement for employment (36.0 percent of all jobs), followed by bachelor's degrees (21.3 percent). Only 2.4 percent of jobs required an associate degree for entry-level employment. Non-degree certifications (i.e., for truck driving and licensed practical nurses) were required for 6.0 percent of all jobs. While these non-degree certifications are often granted through third-party organizations, the education component is predominantly provided by community colleges.

Alternatively, a study by the Federal Reserve Bank of St. Louis Community Development found associate degrees to have significant labor market value.² When compared to a similar person with only a high school diploma, a person with an associate degree earned between 16 to 27 percent more. The study also cited an increase in annual earnings of five to eight percent for each year of education completed at a community college, indicating that postsecondary education, even when a student fails to complete a program, has labor market value.

Other reports, such as the 2011 *Complete to Compete* report by the National Governors Association (NGA), call for increasing postsecondary degree and credential completion rates as the primary means for states to boost their economic competitiveness.³ The NGA awarded Iowa a grant in 2014 to expand statewide efforts to build a strong talent pipeline. The resulting goal of the "Future Ready Iowa" initiative is for 70 percent of Iowa's workforce to have education or training beyond high school by 2025.







It is important to examine the labor market value of completing some level of postsecondary education because students who leave prior to degree completion have often completed a significant portion of the program requirements. A recent analysis from Civitas Learning reported that nearly 22 percent of community college leavers were at or over the 75 percent threshold, and more than 15 percent were at or over the 90 percent threshold, in terms of earned credit hours required for completion.⁴ Assessing completers and leavers outcomes is not new for the Iowa Department of Education and Iowa Workforce Development. Earlier research (2009) conducted by the two agencies titled *Economic Returns and Career Transitions for Iowa Community College Students*⁵, tracked 2002 and 2006 Iowa community college graduates into the workforce for the subsequent seven and three years, respectively. The goal was to explore the individual returns on educational investment for a community college degree, compared to those students who left without a degree within the same time period.

The study found that leavers had the advantage of higher wages in the first year out of school while completers finished their degrees. However, the wages of completers overtook those of leavers within two years of graduation.

The current study looks to expand upon the prior research by exploring the impact of accumulated credit hours, POS, and the industry of employment on success in the workforce. These findings may provide insight for establishing efficient training programs that can more quickly meet industry needs, especially in high-demand occupations.

Defining Completers and Leavers

For the purpose of this research, the following definitions for completers and leavers are used:

<p>A COMPLETER is a non-high school student who successfully completed a POS in an Iowa community college within academic year 2015-2016. Graphically, this cohort will be represented with this icon:</p>	
<p>A LEAVER is a non-high school student who left an Iowa community college without completing a POS within academic year 2015-2016. Graphically, this cohort will be represented with this icon:</p>	
<p>A COMPLETER/LEAVER COHORT is a cohort of non-high school students who left an Iowa community college within academic year 2015-2016. Graphically, this cohort will be represented with this icon:</p>	
<p>A WORKFORCE-BOUND COMPLETER is a non-high school student who completed a POS in an Iowa community college and left postsecondary education within academic year 2015-2016. Graphically, this cohort will be represented with this icon:</p>	
<p>A WORKFORCE-BOUND LEAVER is a non-high school student who left an Iowa community college without completing a POS and left postsecondary education within academic year 2015-2016. Graphically, this cohort will be represented with this icon:</p>	
<p>A WORKFORCE-BOUND COMPLETER/LEAVER COHORT is a cohort of non-high school students who left an Iowa community college and postsecondary education within academic year 2015-2016. Graphically, this cohort will be represented with this icon:</p>	

In addition to these main groups, when needed for comparison, subgroups of leavers were explored; such as leavers who transferred to a four-year institution without completing a POS at an Iowa community college within the academic year. This analysis excludes students who were still in

high school from all cohorts because, while they were simultaneously receiving secondary and postsecondary credits, their primary goal was not to complete a postsecondary POS.

What to Find in this Report

This research will explore the outcomes of students who completed or left their community college program within academic year 2015-2016 (AY15-16). Researchers used the Iowa Department of Education’s community college management information systems (CC MIS) for the original set of student records, the National Student Clearinghouse (NSC) for enrollment into postsecondary education after leaving, and the Iowa Workforce Development (IWD) Unemployment Insurance (UI) records, to follow the leavers into employment in Iowa. Leavers were also followed into employment outside of Iowa with the help of the Wage Records Interchange System (WRIS). During all stages of this research, a comparative analysis of completers and leavers was attempted using the following research questions as a guide:

Question Number	Question	Goal
1	What is the annual proportion of “leavers” to “completers” within a tracking period?	To reveal best practices and longitudinal patterns.
2	What are the demographic and socio-economic characteristics of leavers and how do they differ from those of completers?	To reveal predictability patterns.
3	What are the rates and geographic distribution of completers and leavers who transferred to other postsecondary institutions upon exit?	To assess in-state retention patterns.
4	What are the high-level statistics related to leavers’ POS distributed by the NCES career clusters?	To reveal predictability patterns.
5	What are the granular-level statistics related to leavers’ POS, and is POS related to leavers’ rates?	To reveal predictability patterns.
6	Do leavers’ and completers’ demographics and socio-economic status correlate with their employability and/or wages? What are the similarities and differences between completers and leavers in such correlation patterns, if any?	To determine whether socio-economic status and/or demographics serve as predictability factors of employment outcomes success.
7	Do leavers’ POS correlate with their employability and/or wages?	To determine if POS as a variable influences employment outcomes success.
8	What are the differences and similarities of leavers and completers within the same POS/career cluster in terms of their employability and/or wages?	To assess consistency of POS or cluster-based patterns.
9	How POS correlates with industry of employments in terms of employability and wages?	To determine the value of employment within studied field.

I. DISTRIBUTION OF COHORTS AND SUB-COHORTS

Annually, a new group of students enters Iowa's community colleges, while a certain number leave with or without awards. A short inflow-outflow analysis was conducted to illustrate student movement in order to assess the impact of newcomers and leavers on overall enrollments.

Based on the latest five years of enrollment distributions within Iowa community colleges, freshmen comprise one third (between 31 and 35 percent) of all non-high school community college enrollments. In academic year (AY)15-16, close to 35 percent jointly enrolled (JE) high school students enrolled in Iowa's community colleges for the first time. During AY15-16, Iowa community colleges enrolled 100,772 students who were not jointly enrolled (JE) in high school.

The completer/leaver cohort (n = 61,691) comprised 61.2 percent of all non-high school enrollees during AY15-16. Within that completer/leaver cohort, leavers (n=45,965) comprised almost three-fourths (74.5 percent) (Figure 1-1).

The completer/leaver cohort that stayed in postsecondary education after receiving an award during AY15-16 or that left an original college of enrollment without an award during AY15-16 consisted of 27,973 students. Of this group, leavers (n=20,003) comprised nearly three-fourths (71.5 percent)(Figures 1-2).

FIGURE 1-1: DISTRIBUTION OF THE ENTIRE COMPLETER/LEAVER COHORT

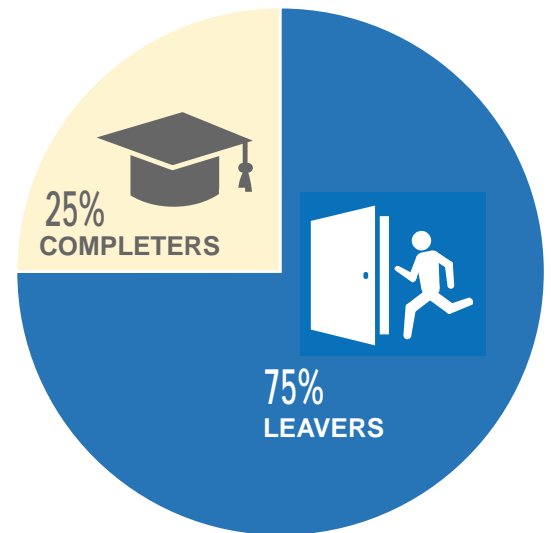
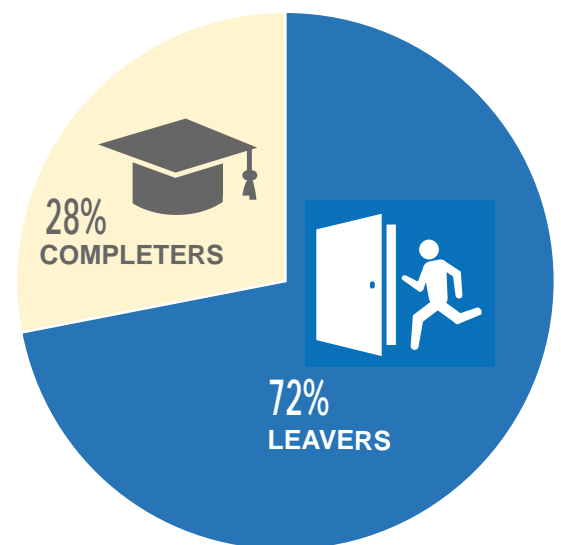


FIGURE 1-2: DISTRIBUTION OF THE COMPLETER/LEAVER COHORT THAT STAYED IN POSTSECONDARY EDUCATION





Implications for Future Research

Awardees comprised 25.6 percent of all students who left Iowa's community colleges in AY15-16. This percentage is close to the traditional graduation rate in Iowa's community colleges. For a comparison, the graduation rate for the latest five cohorts fluctuated between 27 and 35 percent. Further research might establish a certain correlation between completer/leaver and graduation rates, serving as a basis for early predictors of graduation rates.

Section I. Conclusion

Whether intending to transfer, or planning to join the workforce, three-fourths of all students who leave a community college during an academic year do so without having earned an award.

II. PROFILES OF COMPLETERS AND LEAVERS

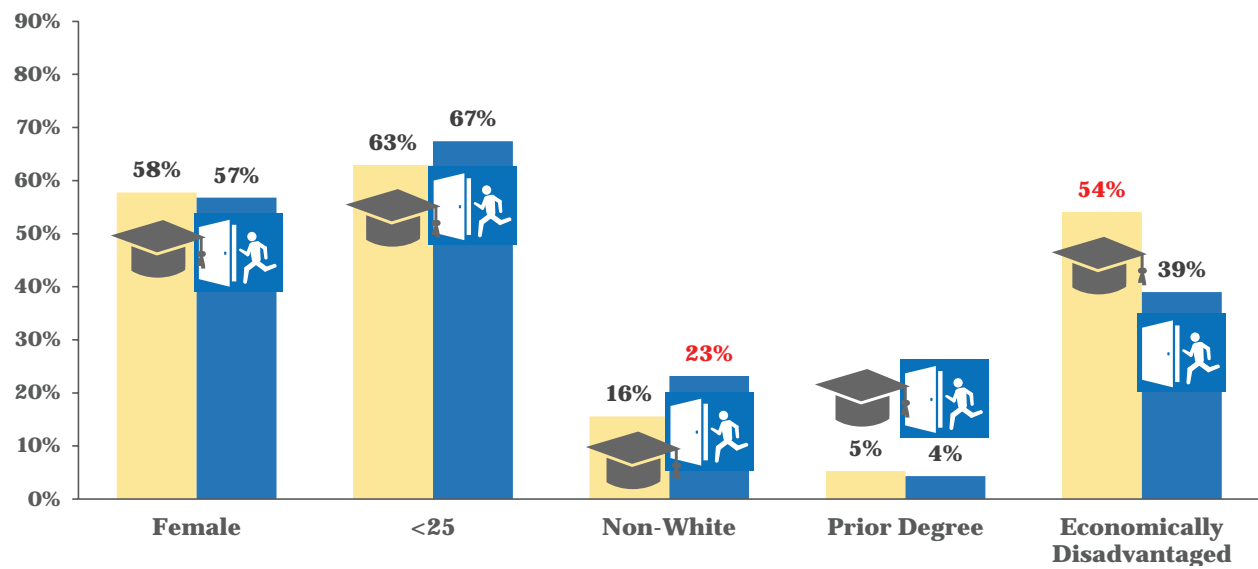
To reveal the predictability patterns and establish potential improvement areas, researchers explored the socioeconomic and demographic characteristics of completers and leavers. Both cohorts were disaggregated by gender, age groups ("traditional" age students under 25 years old and "non-traditional" age students 25 years or older), ethnic/racial groups, economically disadvantaged and non-economically disadvantaged, and students with prior college degrees (earned in other colleges) and those without degrees.

The analysis revealed the following statistics:

- » Over half of the completers and leavers were female (58.0 and 57.0 percent, respectively).
- » Two-thirds (67.0 percent) of leavers were traditional-age students (18 to 24 years old) and 63.0 percent of the completers were traditional-age students.
- » Racial/ethnic minorities were represented at higher rates among leavers (23.0 percent) as compared to among completers (16.0 percent).
- » Percentages of students with prior degrees earned at other institutions were low in both categories (five percent for completers and four percent for leavers).
- » Economically disadvantaged students were represented at significantly higher rates among completers (54.0 percent) as compared to among leavers (39.0 percent).

In summary, a typical **completer** was a white, economically disadvantaged female of traditional college age, without a prior degree. A typical **leaver** was a white, non-economically disadvantaged female of traditional college age, without a prior degree (Figure 2-1).

FIGURE 2-1: COMPARATIVE SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF ALL COMPLETERS AND LEAVERS*



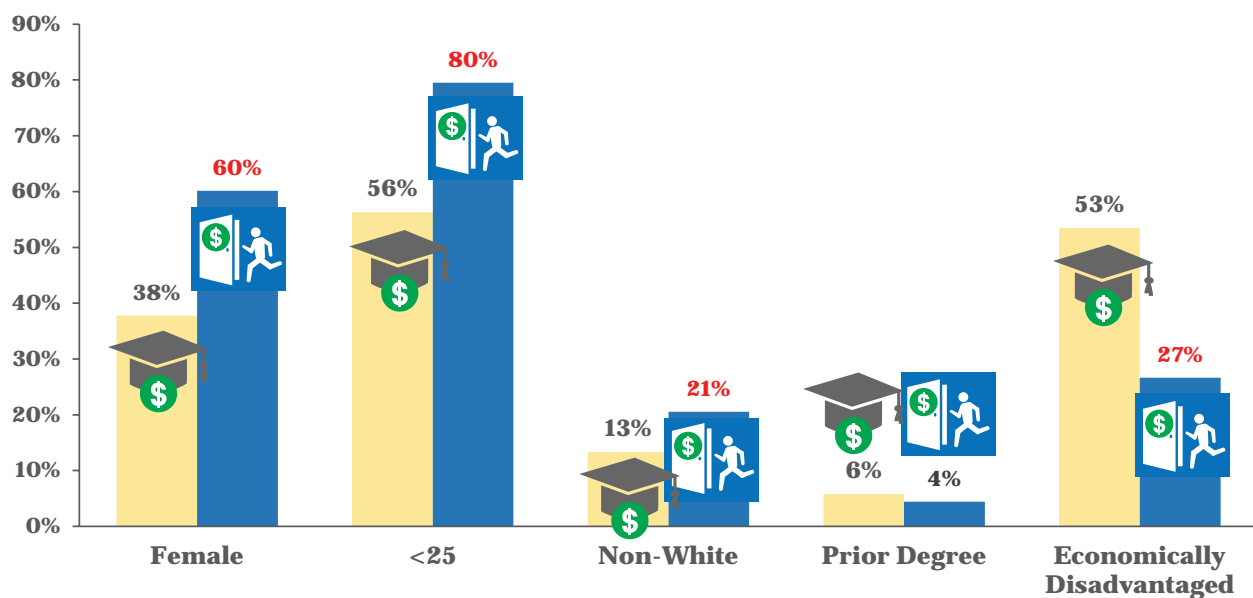
*Significant variances highlighted in red.

Similar analysis was conducted for the workforce-bound sub-cohort of completers/leavers. These students did not continue their education or training after leaving the community college. Although the overall distribution looked similar to the overall completer/leaver cohort, there were the following noticeable differences:

- » The proportion of female completers fell to 38.0 percent, while the proportion of female leavers grew to 60.0 percent.
- » The gap between completers and leavers in the traditional age distribution increased significantly. Among completers, 56.0 percent were of the traditional student age, while among leavers that age group comprised an overwhelming 80.0 percent.
- » Completers and leavers were represented by smaller percentages of racial/ethnic minorities, although the proportion remained similar (13.0 percent for completers, 21.0 percent for leavers).
- » The proportion of students with prior degrees remained low for both completers and leavers, at six percent and four percent, respectively.
- » The gap between the percentage of economically disadvantaged among completers and leavers grew significantly, with 53.0 percent for completers and only 27.0 percent for leavers.

Consequently, a typical workforce-bound completer can be described as a white economically disadvantaged male of traditional college age, without a prior degree from another college. A typical workforce-bound leaver was a white, predominantly not-economically disadvantaged female without a previously earned degree from another college (Figure 2-2).

FIGURE 2-2: COMPARATIVE SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF WORKFORCE-BOUND COMPLETERS AND LEAVERS*



*Significant variances highlighted in red.



Implications for Future Research

Explore correlation between socioeconomic status and program completion rates.

Section II. Conclusion

Compared to completers, leavers show a similar gender distribution, are slightly younger, more racially diverse, less economically disadvantaged, and have similar percentages of students with prior degrees. Workforce-bound leavers consist of more females than the workforce-bound completers, are significantly younger, and more racially diverse. Both groups demonstrate similar statistics regarding prior degree attainment, and only 27.0 percent of workforce-bound leavers are economically disadvantaged, as compared to 53.0 percent of workforce-bound completers.

III. TIME TO EXIT AND EDUCATIONAL VALUE UPON EXIT

Iowa Code stipulates the length of time for the completion of community college programs. Associate degrees should not exceed two years of full-time study, while diploma and certificate programs are designed to be completed within one year. Some short-term programs (typically, under 22 credit hours) can be completed in under one year. Practical experience, however, demonstrates that, on average, only an estimated 40 percent of Iowa community college awardees complete associate degrees within two years. Approximately the same average percentages are true for the completion of diplomas and certificates within a year.

In addition to length of time, Iowa Code stipulates the number of credit hours each program type requires. Associate degrees range from 60 to 86 credit hours, while diploma and certificate programs may not exceed 48 credit hours. To become a program completer, a student must successfully complete all prescribed credit hours. It is possible, therefore, to conduct a comparative analysis of both the time to award for completers and time to exit for leavers. Additionally, it is possible to analyze the amount of accumulated credits upon exit for both the completers and leavers. Such an assessment may reveal certain predictability patterns to boost retention efforts for potential leavers.

Both completers and leavers were tracked back to their first day of enrollment in a community college as non-high school students. The award date for completers and the latest course end date for leavers were used as the exit dates. The time to exit was then calculated as the number of years between the start and exit dates. Additionally, the number of earned credits was assigned for completers, based on the number of credit hours required for completion of their awards. For the leavers, all earned credit hours at the time of exit were used. Moreover, the average credit hour gain per student in the entire and workforce-bound cohorts were calculated.

Based on the results, a typical completer from the entire completer/leaver cohort earned an award in 2.7 years with an average of 56.5 earned credit hours. The entire completer cohort earned a total of 865,826 credit hours upon exit. On the other hand, a typical leaver from the entire completer/leaver cohort earned 28.2 credit hours upon exit and had stayed in the original college for an average of 1.9 years. The entire leaver cohort exited with a total of 1,360, 966 earned credit hours (Figure 3-1).

A typical completer from the workforce-bound completer/leaver cohort earned an award in 2.8 years with an average of 60.2 earned credit hours, while the entire workforce-bound completer cohort earned a total of 446,446 credit hours upon exit. A typical leaver from the workforce-bound completer/leaver cohort earned 27.9 credit hours upon exit and stayed in the original college for an average of 1.7 years. The entire workforce-bound leaver cohort earned a total of 588,242 credit hours upon exit (Figure 3-1).

There are a number of ways to interpret the significantly higher total number of credit hours earned by leavers, and the dramatically lower average number of earned credits per leaver as compared to completers. To avoid misinterpretations, the group of leavers with zero earned credit hours was analyzed further, since that specific group could have negatively impacted the average number of earned credits per leaver.

The analysis of this zero earned credit sub-group of leavers established that they comprised 9.3 percent of all leavers (n = 4,279). When compared to all leavers, they had similar gender and age distribution; however, there were nearly twice as many students who identified as racial/ethnic minority (45.0 percent), a lower number of students who had previously earned degrees, a significantly higher percentage of economically disadvantaged students (50.0 versus 39.0 percent) and nearly two-third of traditional age students. The entire cohort of leavers exited after an average of 1.9 years, while those with no credit hours exited in only 0.5 years on average (Figure 3-2).

FIGURE 3-1: TIME TO AWARD/EXIT, TOTAL EARNED CREDIT HOURS, AND AVERAGE EARNED CREDIT HOURS FOR COMPLETERS AND LEAVERS

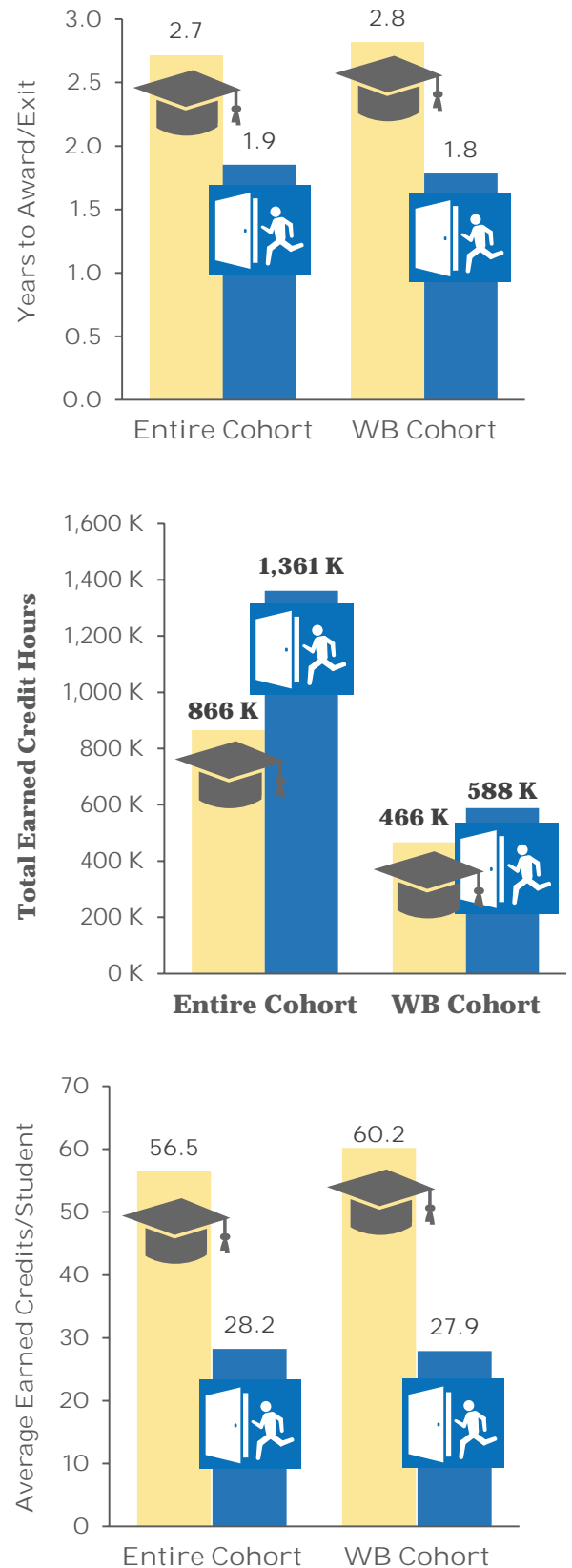
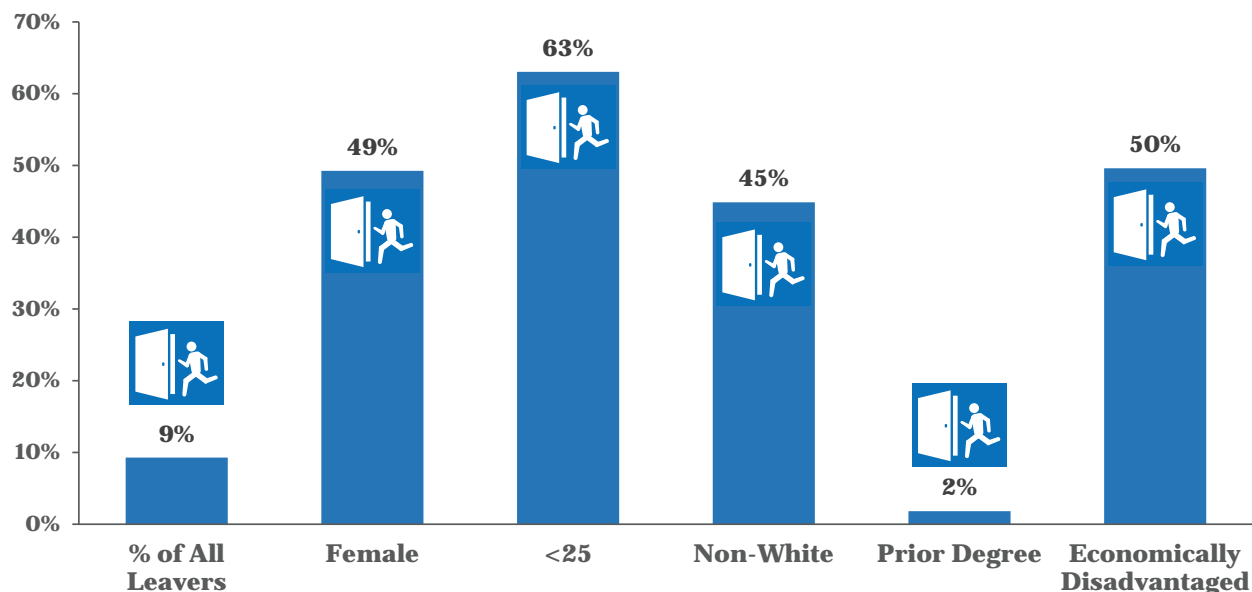


FIGURE 3-2: SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF LEAVERS WHO EXITED WITH NO EARNED CREDIT HOURS



Implications for Future Research

For further research: Demographics and economic status as factors impacting time to degree/ time to exit, and the amount of accumulated earned credit hours.

Section III. Conclusion

As expected, leavers' time to exit is shorter than completers' time to award, and they leave with half of the credit hours earned by completers. Nevertheless, in mass, they are responsible for the majority of completer/leaver cohort credit hours, both in the entire and in workforce-bound cohorts. Leavers earned nearly two-thirds (61.1 percent) of completer/leaver cohort earned credit hours, and over half (56.0 percent) of completers/leavers workforce-bound cohort earned credit hours. Compared to all leavers, leavers with no earned credit are significantly more economically disadvantaged, contain significantly higher percentages of racial/ethnic minorities, and exit, on average, during their first half year of enrollment.

IV. IN- AND OUT-OF-STATE TRANSFERS

This section describes another completer/leaver sub-cohort: students who, upon exiting their original college, transferred to another college. Exploring various pathways for this sub-cohort would easily serve as a stand-alone report; however, for the purposes of this report, only the volume of in- and out-of-state transfers for AY15-16 completers and leavers was analyzed.

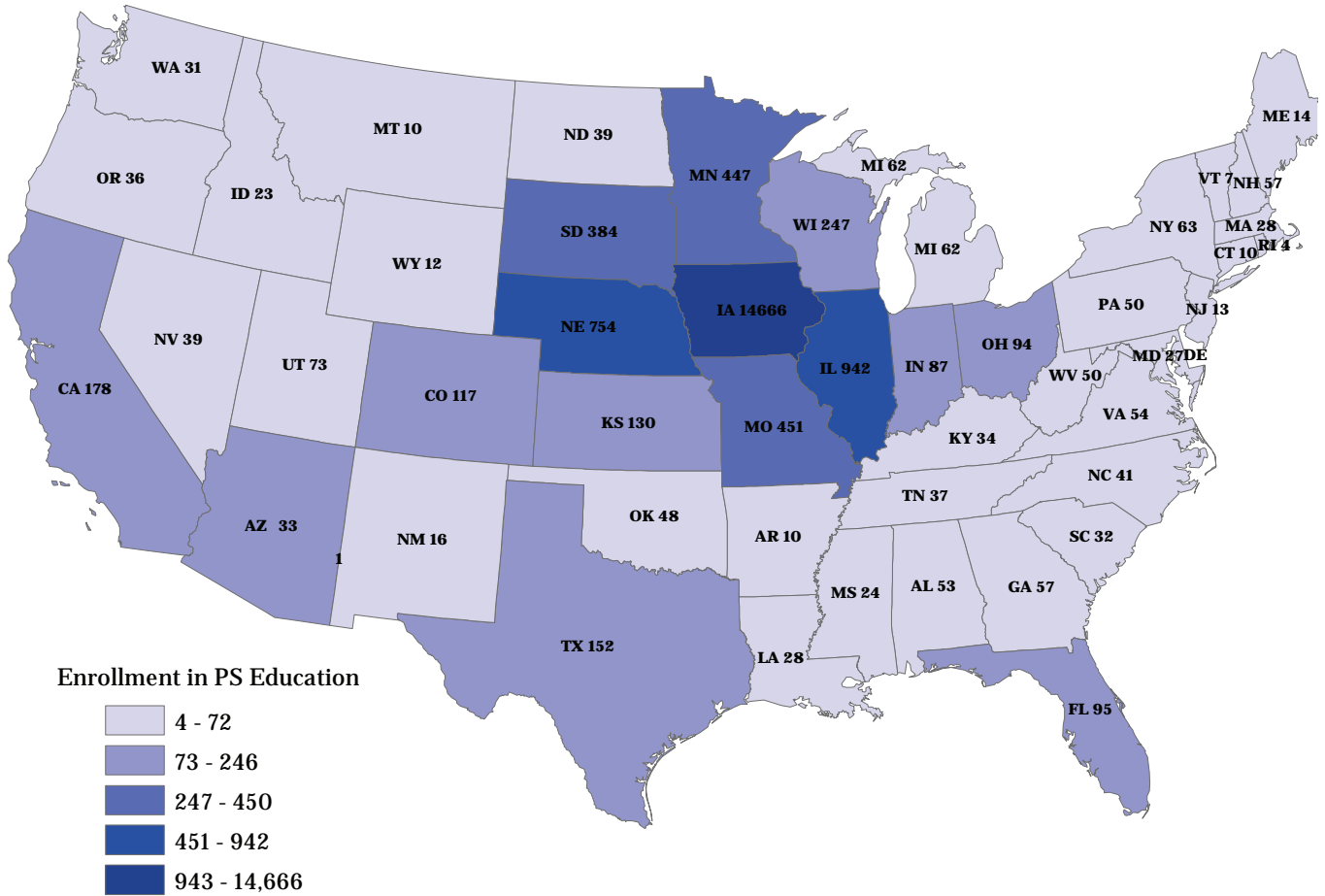
Overall, the completers transferred at lower rates than the leavers. Half (49.7 percent) of completers and over half (56.5 percent) of leavers transferred to other postsecondary institutions. This finding is not surprising as a significant number of community college students in college-parallel programs actually plan to transfer without completing their associate degrees. Nor is it surprising that the completers transferred within Iowa at higher rates (79.9 percent) than leavers (73.3 percent), since Iowa's public colleges and universities maintain articulation agreements that allow for more seamless transfer for associate of arts or science degree completers.

The higher rate of leavers transferring to four-year institutions (76.2 percent, compared to 61.6 percent of completers) was also expected. Most of career and technical education (CTE) program completers never plan to continue their postsecondary education, while most of the leavers who intended to transfer to a four-year institution accumulated credit hours in transferable arts and science coursework.

Due to the geographic proximity, most of the leavers who transferred were found in adjacent states. The majority transferred to colleges in Illinois (942), Nebraska (754), Missouri (451), Minnesota (447), South Dakota (384), and Wisconsin (247). Others transferred to states much further away, such as California (178) and Texas (152) (Figure 4-1).



FIGURE 4-1: GEOGRAPHIC DISTRIBUTION OF LEAVERS WHO TRANSFERRED TO ANOTHER POSTSECONDARY INSTITUTION UPON EXIT



Section IV. Conclusion

Compared to completers, leavers transfer at higher rates (56.5 percent) than completers (49.7 percent). Leavers also transfer at significantly higher rates to four-year institutions (76.2 percent compared 61.6 percent). However, completers transfer in-state more often (79.9 percent) than leavers (73.3 percent).

V. CAREER CLUSTERS OF COMPLETERS AND LEAVERS

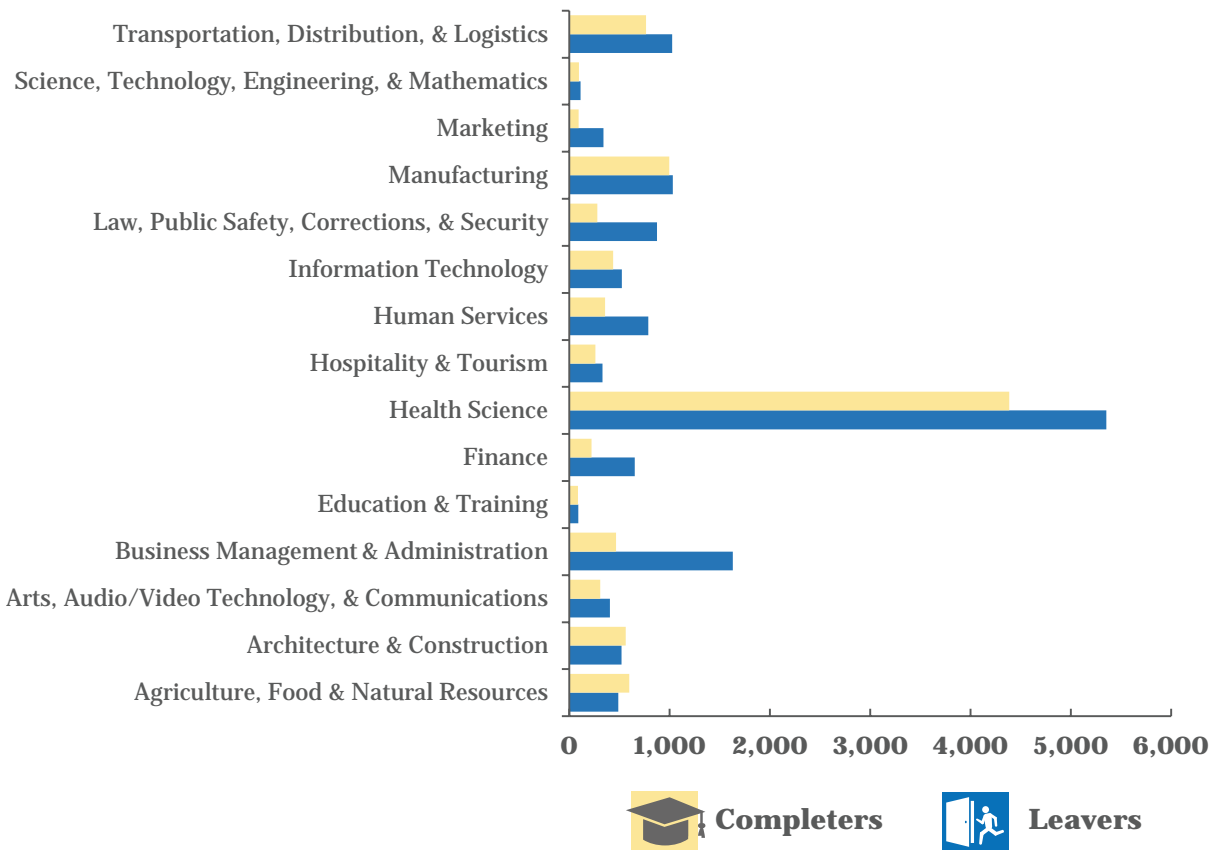
The U.S. Department of Education maintains the framework of career clusters through its National Center for Educational Statistics (NCES). NCES recognizes 16 career clusters⁶, encompassing the distribution of existing Classification of Instructional Program (CIP) framework. Distribution of all programs of study within the existing framework of NCES career clusters allows for a quick assessment of similarities and differences in POS patterns for completers and leavers.

Before engaging in a career cluster analysis, it is important to note that over one-third of AY15-16 completers (37.3 percent) graduated with a liberal arts and science degree, which is traditionally viewed as a non-technical POS and not classified within a career cluster. This especially impacts the leavers analysis, as 69.1 percent of those who left were either enrolled in a liberal arts and science program or were not enrolled in any POS. Students classified as “no POS” typically take credit courses with no program affiliation either because they have not decided upon a POS or are not seeking to complete a degree program.

When analyzing the remainder of leavers and completers who were enrolled in CTE programs, the largest percentage were enrolled in programs associated with the health science career cluster (44.0 percent of CTE completers and 38.0 percent of leavers). The smallest percentage of completers (one percent) and leavers (2.4 percent) belonged to the marketing, sales, and service career cluster. There were significantly more leavers in the business, management, and administration cluster (11.5 percent, vs. 4.7 percent completers); and in the law, public safety, corrections, and security cluster (6.2 percent vs. 2.8 percent completers).

There were more completers represented in the architecture and construction (5.7 percent vs. 3.7 percent leavers); and in the agriculture, food, and natural resources career clusters (6.0 percent vs. 3.5 percent for leavers) (Figure 5-1).

FIGURE 5-1: DISTRIBUTION OF CTE COMPLETERS AND LEAVERS PROGRAM OF STUDY BY CAREER CLUSTER



Implications for Future Research

Reasons behind the differences between leavers and completers in distribution of POS by career clusters.

Section V. Conclusion

While most completers (62.7 percent) left with an award in a career and technical education (CTE) programs, most leavers (69.1 percent) were enrolled in a liberal arts and science program or were not enrolled in any specific program of study (POS). The health science POS was dominant among both CTE completers and leavers (44.0 percent and 38.0 percent, respectively). CTE leavers were significantly more active in the business, management, and administration career cluster than completers (11.5 percent and 4.7 percent, respectively).

VI. PROGRAM OF STUDY (POS) OF LEAVERS

Analyzing student choices on the granular level of their attempted POS may allow for identification of some reasons for a departure from original enrollment. Therefore, while it might be interesting to continue the comparison between completers and leavers, concentrating on leavers' POS analysis might provide practical conclusions for improvement of retention and completion rates. All cohorts and sub-cohorts of leavers were explored by program distribution using the entire cohort, transferred leavers, and workforce-bound leavers.

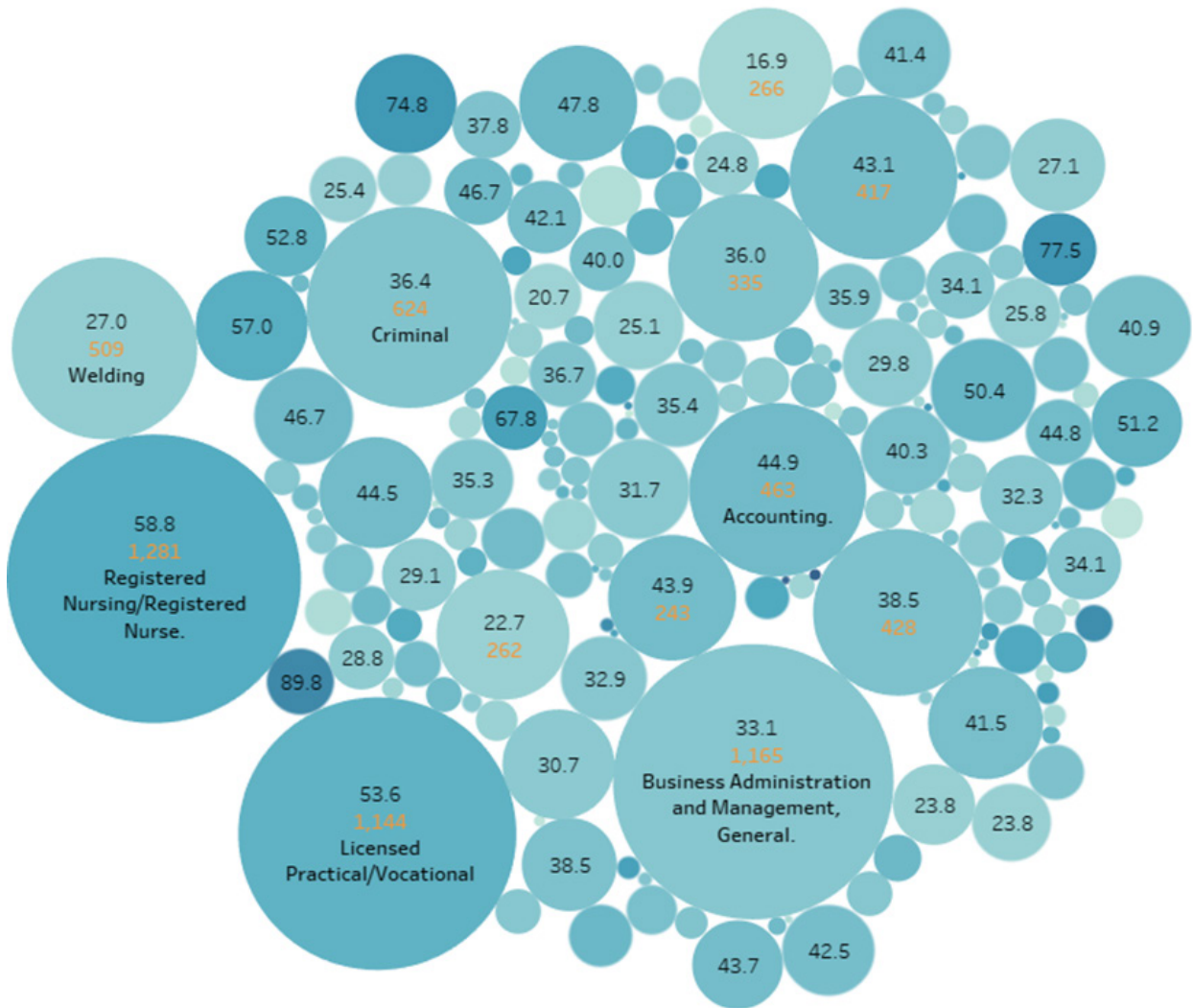
The highest per-program volume of leavers belonged to the combined category of liberal arts and sciences and no-POS students. Therefore, it was not surprising that the same category was the highest when disaggregated by sub-categories (67.7 percent of all leavers, 80.3 percent of transfer leavers, and 59.2 percent of workforce-bound leavers). For reasons discussed earlier, we expected the significantly higher percentages of those who had been enrolled in liberal arts and science among transferred leavers.

In contrast to no-POS and liberal arts and science programs, the career and technical education (CTE) programs of study presented a varied distribution. There were 190 CTE POS shared by leavers during AY15-16; however, registered nursing, licensed practical nursing, business administration, criminal justice, accounting, and welding POS leavers comprised close to 37.0 percent of all CTE leavers.

Figure 6-1 is an illustration of each CTE POS with the size of each bubble visually representing the number of leavers. Wherever bubble size permits, the number of leavers is displayed in orange and the average number of earned credits is displayed in black, with the darker shading of the bubbles representing higher number of average credits per leaver.

The POS with the largest enrollments also had a relatively high number of earned credits per student. Overall, there seemed to be no correlation between the number of leavers and the number of earned credit hours per leaver per CTE POS ($R = 0.03$). Overall, the correlation between the number of CTE leavers and the number of earned credit hours per leaver by CTE POS was not statistically significant ($R = 0.1$), but was higher than when compared to all leavers.

FIGURE 6-1: DISTRIBUTION OF ALL CTE LEAVERS BY PROGRAM OF STUDY



When analyzing each group separately, leavers who transferred comprised over 30 percent of all CTE leavers; however, they were concentrated in fewer POS compared to all CTE leavers. While this group was represented in 156 CTE programs, the majority of students in this CTE leavers who transferred cohort were concentrated in five programs. The remaining 151 programs of study contained under 100 leavers each.

Top five programs by enrollment for CTE leavers who transferred were:

- » Nursing/Registered Nurse (n=488, average credit per student=62.8)
- » Licensed Practical/Vocational Nurse (n=421, average credit per student = 53.7)
- » Business Administration (n=281, average credit per student=36.8)
- » Criminal Justice (n=168, average credits per student=46.4)
- » Accounting (n=130, average credits per student=52.9)

Overall, the correlation between the number of CTE leavers who transferred and the number of earned credit hours per leaver by CTE POS was not statistically significant ($R = 0.1$), but was higher when compared to all leavers.

CTE workforce-bound leavers comprised close to 70 percent of all CTE leavers. Even though the number of POS (187) in this category was comparable to transferred cohort, the concentration was quite different with 25 POS containing over 100 leavers, comprising over 65 percent of these leavers. The overall correlation between the number of workforce-bound leavers and the number of earned credit hours per leaver per CTE POS was weak ($R = 0.01$).

Top four programs by enrollment comprised 31.0 percent of all CTE workforce-bound leavers:

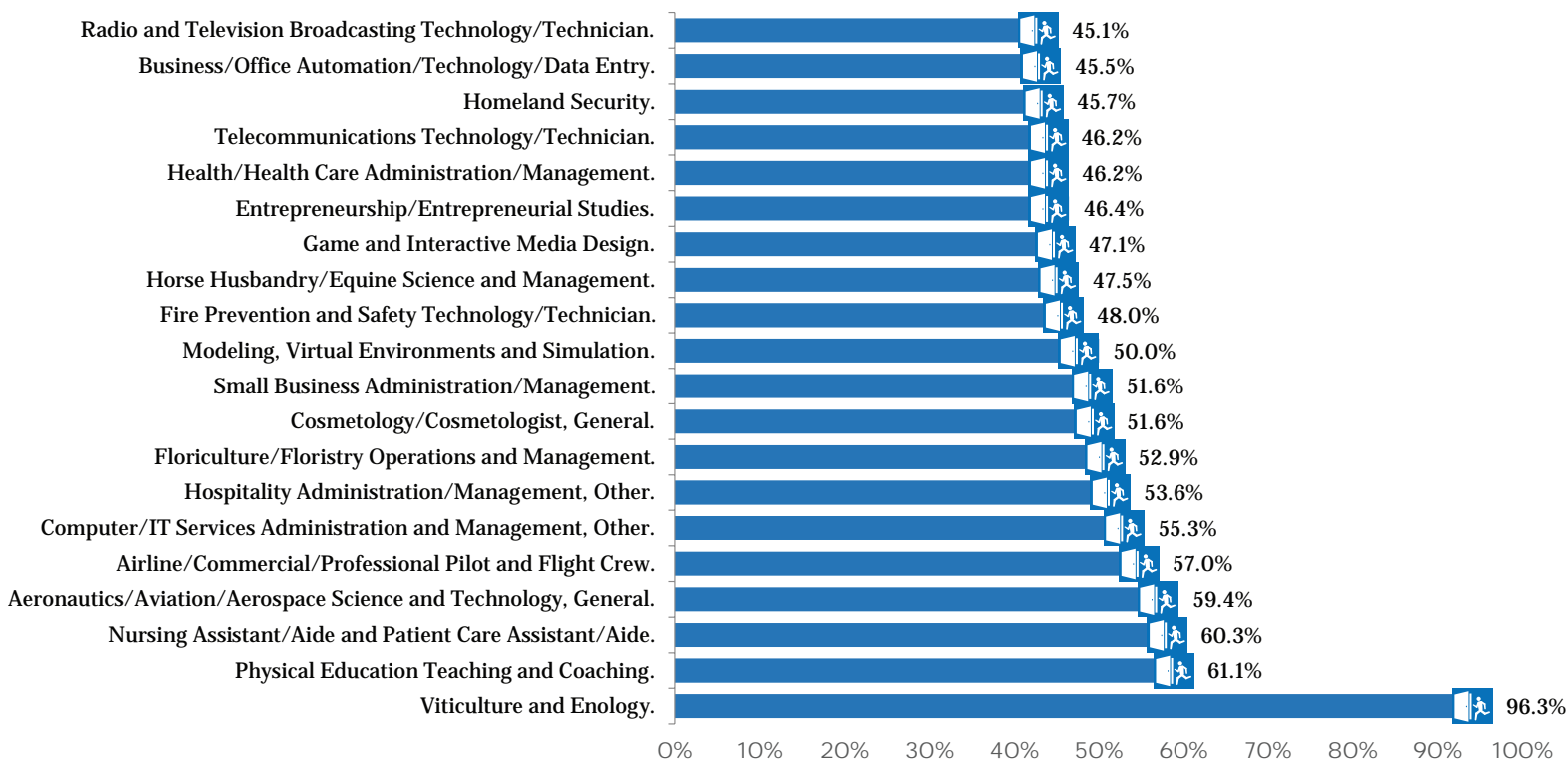
- » Business Administration (n=884, average credits per student=31.9)
- » Registered Nurse (RN) (n=793, average credit per student=56.3), licensed practical nurse (LPN) (n=723, average credit per student=53.6)
- » Welding (n=458, average credit per student=26.5)
- » Criminal Justice (n=456, average credit per student=32.7)

Theoretically, one might assume that the number of leavers would be proportional to the total enrollment per POS. To test this theory, CTE programs with enrollments of at least 10 students statewide were explored.

The resulting set consisted of 164 CTE programs with the proportion of leavers ranging from 96.3 to 4.9 percent (with an average of 32.5 percent and median of 31.9 percent). The numbers of enrollees per programs ranged from 11 in the vehicle maintenance and repair technologies program, to 4,323 enrolled in the registered nursing/registered nurse program. There were programs that had nearly all of their students leave without an award during AY15-16, such as viticulture and enology where 96.3 percent of enrollees left without an award, and physical education teaching and coaching program at 61.1 percent. The motorcycle maintenance and repair POS demonstrated the lowest percentages of leavers at 4.9 percent.

Per program exit rates were not linear, meaning the largest POS did not necessarily present the highest percentages of leavers as illustrated in Figure 6-2 (programs with large enrollment such as RN, LPN, accounting, and welding were not among the top 20).

FIGURE 6-2: PERCENTAGES OF LEAVERS PER TOTAL NON-HIGH SCHOOL ENROLLMENTS IN CAREER AND TECHNICAL EDUCATION PROGRAMS OF STUDY (TOP 20)



Implications for Future Research

The reasons behind variances in rates of leavers from specific programs of study (POS).

Section VI. Conclusion

On average, close to one-third of each CTE POS consists of students who leave education without earning an award. The percentage of leavers per CTE program ranges from 4.9 to 96.3 percent. Liberal arts and science and students with no POS transfer at the highest rate (82.6 percent). The percentage of leavers per CTE program is not directly related to the enrollment in those programs.

VII. POST-EXIT EMPLOYMENT AND WAGES

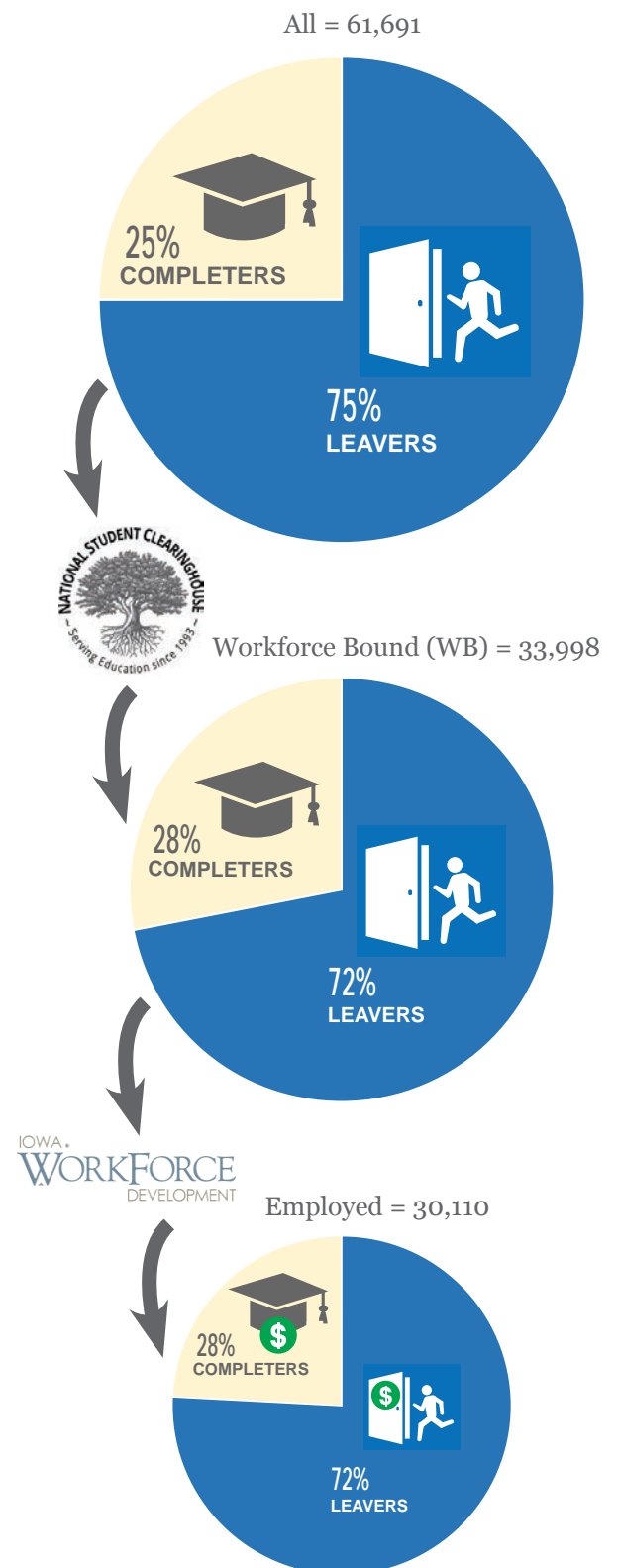
A comparative analysis of post-exit employment and wages leads to important conclusions about the value of POS completion vs. not earning an award. The initial completer/leaver cohorts and sub-cohorts were processed in a task-specific order using several third-party databases.

The initial completer/leaver cohort (n=61,691), where leavers and completers comprised 75.0 percent and 25.0 percent respectively, was processed through the National Student Clearinghouse (NSC) to identify the students who continued to postsecondary education after they left their college of original enrollment. Those not found in the NSC comprised the workforce-bound (WB) cohort (n=33,998). Similar to overall completer/leaver cohort distribution, the WB cohort consisted of 72.0 percent of leavers and 28.0 percent of completers.

The WB completer/leaver cohort was then processed through the unemployment insurance (UI) database maintained by the Iowa Workforce Development and its nationwide partners to establish the rates of employment and wage ranges for all WB completers and leavers. This last stage found 30,110 completers and leavers in employment during their first post-exit year (Figure 7-1).

Once the employed WB completer/leaver cohort was established, a comparative analysis of completers/leavers employability and wages was conducted. The completers were additionally disaggregated by the size of the award, reflected by the prescribed completion time and the number of required credit hours: two-year degrees, one-year, and less-than-

FIGURE 7-1: IDENTIFYING POST-EXIT EMPLOYMENT OF LEAVERS AND COMPLETERS



one-year awards. For leavers, earned credit hour award equivalents were created. The students were grouped by those who had earned 60 or more credit hours (an equivalent of a two-year award), 22-48 earned credit hours (one-year award), less than 22 earned credit hours (less-than-one-year award). Those who left prior to earning any credits (“zero-earned credit hours” group) were analyzed as a separate category.

The analysis revealed that 91.5 percent of completers and 87.7 percent of leavers were found in employment during the first year post exiting education. Their median wages were significantly different: \$30,920 per year for completers and \$22,827 per year for leavers. “Zero earned credit hours” leavers demonstrated the lowest rate of employment compared to all analyzed cohorts and sub-cohorts with 85.6 percent employed and a median annual wage of \$14,724.

The completers and the leavers demonstrated the highest similarity on the two-year degree level, with slightly higher median annual wages for completers (\$32,128 versus \$30,301 for leavers) and slightly higher employability rates (91.3 percent versus 89.4 percent for leavers).

Similarly, completers had significantly higher wages and somewhat higher employability rates for two other award types. In the one-year award category, 92.5 percent of completers were employed with an annual median wage of \$25,399, while 87.6 percent of leavers were employed in the same category with an annual median wage of \$23,585. The under-one-year award category yielded 90.8 percent of employment and \$25,399 annual median wage for completers, and 97.4 percent employment earning an annual median wage of \$21,039 for leavers (Figure 7-2).

Similar to the transfer geography distribution (Figure 4-1), most of the WB completers and leavers stayed in Iowa. The bulk (83.6 percent) of completers remained in Iowa after postsecondary education exit, while 69.1 percent of leavers found employment in Iowa. The remaining 30.9 percent of leavers were located around the nation with the largest numbers in adjacent states, California, or Texas. The highest median annual wage for the out-of-state leavers were earned in the District of Columbia (\$42,051), and the lowest in Hawaii (\$1,156). Those that remained in Iowa earned an annual median wage of \$23,319, which is above the nationwide median wage of \$20,327. Correlation between the number of employed and the size of their wages was low ($R=0.04$) (Figure 7-3).

FIGURE 7-2: COMPLETERS' (LEFT) AND LEAVERS' (RIGHT) EMPLOYABILITY RATES (% , BOTTOM) AND MEDIAN ANNUAL WAGES BY AWARD CATEGORY OF AWARD, FIRST YEAR FOLLOWING EDUCATION

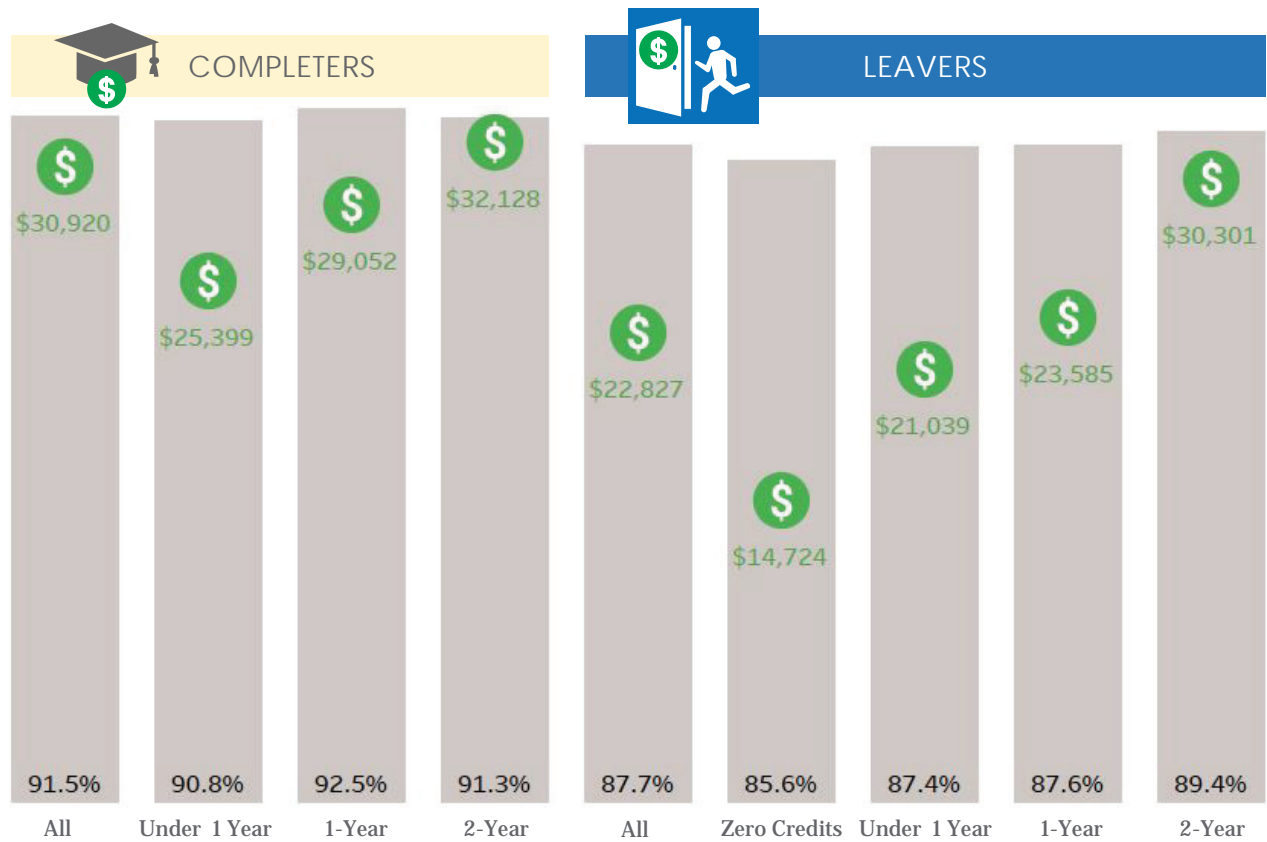
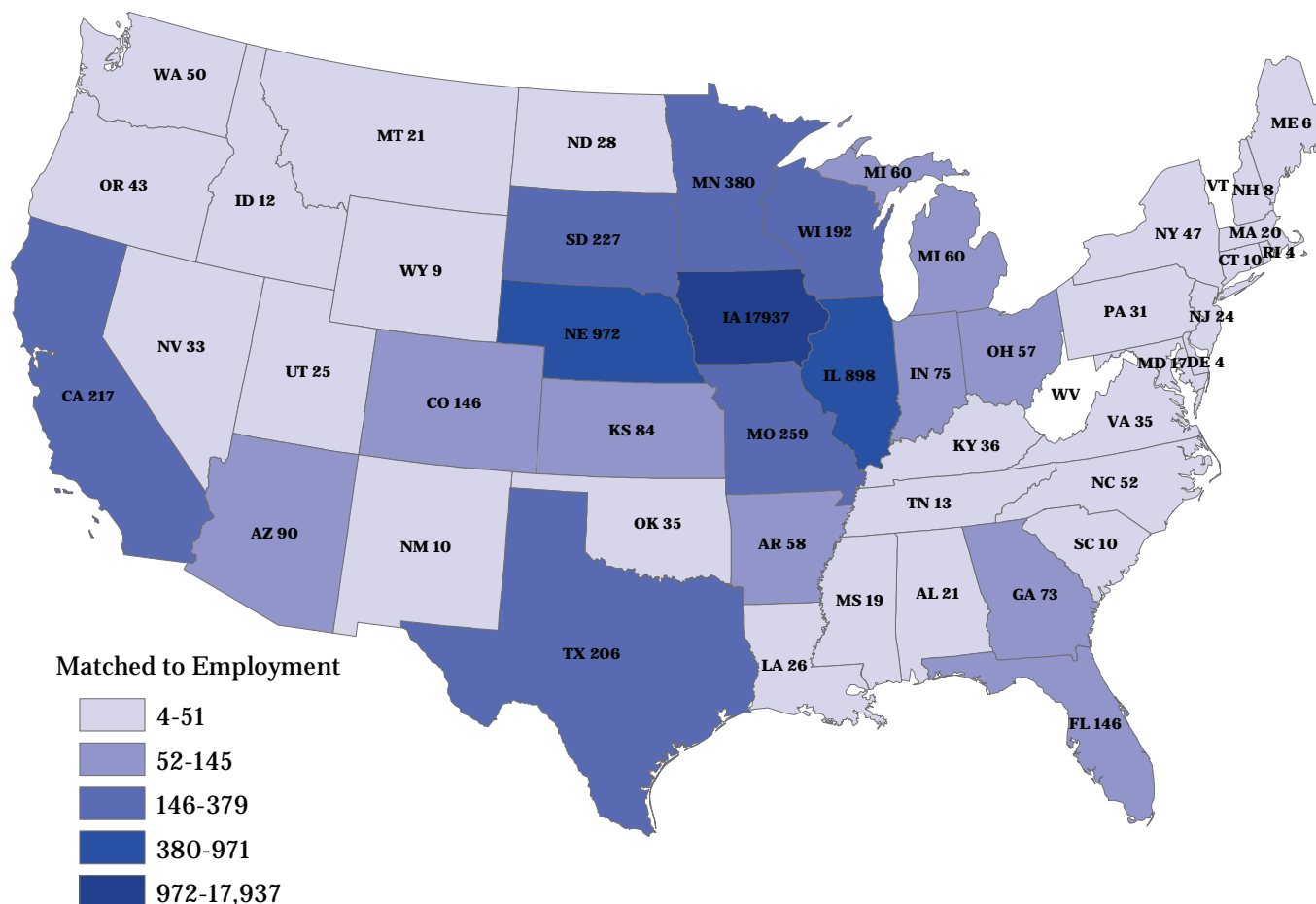


FIGURE 7-3: GEOGRAPHIC DISTRIBUTION OF LEAVERS FOUND IN EMPLOYMENT DURING THEIR FIRST YEAR FOLLOWING EXIT



Implications for Future Research

The reasons behind variances in rates of leavers from specific programs of study.

Section VII. Conclusion

Overall, the completers earned 26.2 percent higher wages during the first year of employment and were found in employment at close to four percent higher rates. Those who completed a two-year degree earned the highest wages, although leavers with a two-year degree equivalent of earned credit hours earn close to completers' wages (only about six percent less). The majority of completers also remain in Iowa for employment (83.6 percent), whereas a lower percentage of leavers remained in Iowa (69.1 percent). Additionally, leavers with a smaller award equivalent earn significantly less when compared to completers.

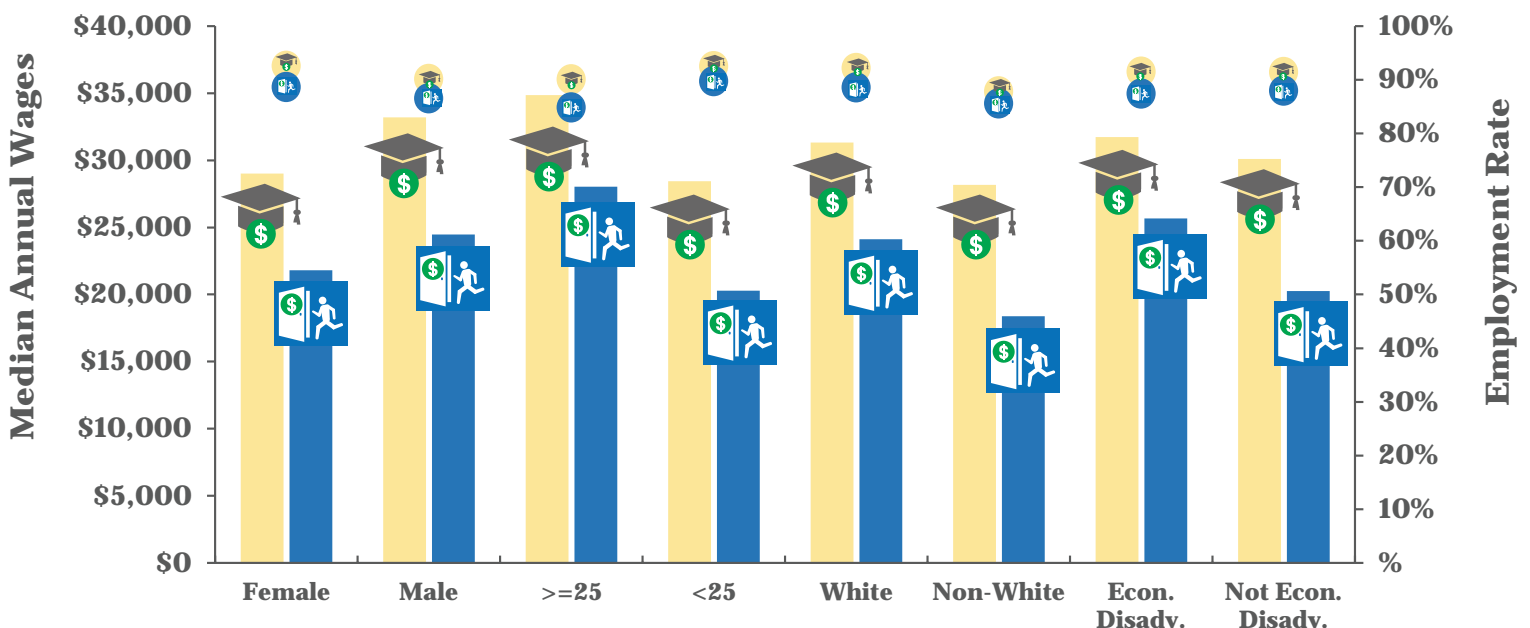
VIII. EMPLOYMENT RATES, WAGES BY DEMOGRAPHICS

Similar to the overall distribution of completers and leavers, their employment and wage data has been analyzed by demographics and economic status. The overall analysis demonstrated that the wages of completers in every category were consistently higher than those of leavers. However, the white economically disadvantaged male completers of non-traditional college age received the highest wages during the first year of employment after completing of their POS.

Figure 8-1 illustrates the median wages of the WB cohort (shown by bars, wages on the left axis) and employment percentages (demonstrated by circles, percentages on the right axis). Employment rates were high, regardless of the completion status or a student's demographics. However, the range was narrow: between 85 percent (completers, 25 years and older) and 93 percent (female completers), even though completers were higher in every category.

The white female completers under 25 years of age had the highest percentages of employment and non-white students, in general, earned the lowest wages. The economic status played practically no role for completers-to-leavers comparison; however, the economically disadvantaged group earned more than those who were not economically disadvantaged (Figure 8-1).

FIGURE 8-1: EMPLOYMENT RATE (BUBBLES, RIGHT AXIS) AND MEDIAN ANNUAL WAGES (BARS, LEFT AXIS) OF COMPLETERS AND LEAVERS DISAGGREGATED BY DEMOGRAPHIC CATEGORIES AND ECONOMIC STATUS



IX. EMPLOYMENT RATES, WAGES BY CAREER CLUSTER

Paralleling the completer/leaver comparative analysis, the analysis of wages and employment for completers and leavers was conducted based on the career cluster of the students' programs of study (POS). The analysis might shed some light on completers/leavers career success based on the type of training and the industry in which they became employed. Figure 9-1 presents the reference table for career clusters.

FIGURE 9-1: THE NATIONAL CAREER CLUSTERS® FRAMEWORK

Number	National Career Cluster
1	Agriculture, Food, and Natural Resources
2	Architecture and Construction
3	Arts, A/V Technology, and Communications
4	Business Management, and Administration
5	Education and Training
6	Finance
7	Government and Public Administration
8	Health Science
9	Hospitality and Tourism
10	Human Services
11	Information Technology
12	Law, Public Safety, Corrections, and Security
13	Manufacturing
14	Marketing
15	Science, Technology, Engineering, and Mathematics
16	Transportation, Distribution, and Logistics

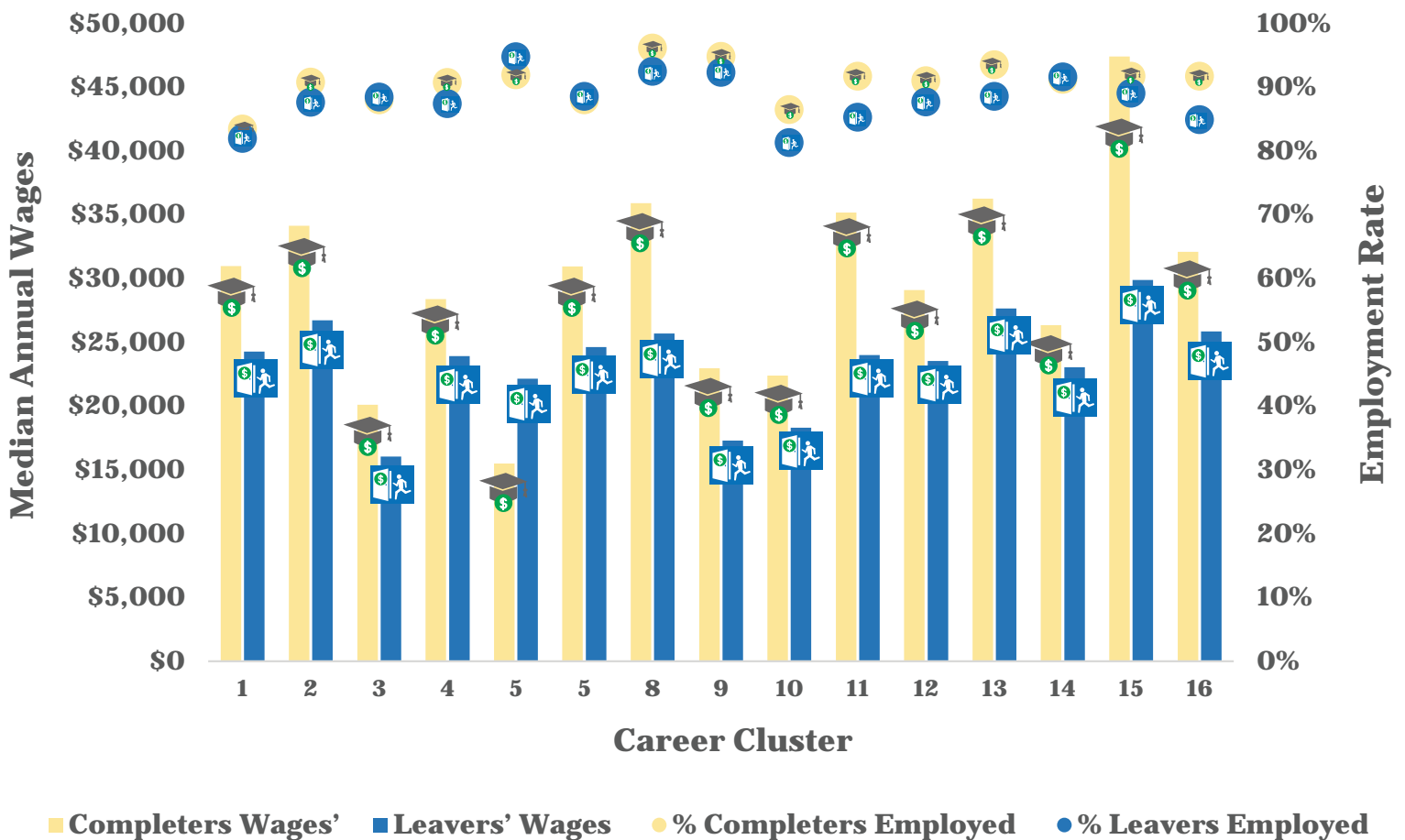
To start this analysis, 87.8 percent of the liberal arts and science (A&S) program completers and 86.9 percent of A&S program leavers were found in employment.

For those students who completed a career and technical education (CTE) program, the health science cluster had the highest employment percentage (96.1 percent) and agriculture was the lowest (83.4 percent). However, an important caveat should be noted for the workers associated with the agriculture industries. Since employment and wages are gathered through the unemployment insurance records, the resulting data only include employers who pay UI taxes and do not include self-employed entities such as family farms.

CTE leavers in the education and training cluster (#5) had the highest employment percentage at 94.7 percent, while the lowest percent employed was in the human services cluster (#10) at 81.3 percent (Figure 9-2).

Liberal A&S completers and leavers earned \$24,643 and \$21,799, respectively. For CTE POS students, both completers and leavers earned the highest wages in the science, technology, engineering and mathematics (STEM) cluster (#15): \$47,415 (completers) and \$29,887 (leavers). On average, the CTE program completers earned a median annual wage of \$29,519 and leavers earned \$23,426 (20.6 percent less than completers). With the exception of the education and training cluster, completers earned more in every cluster (Figure 9-2).

FIGURE 9-2: EMPLOYMENT RATES (BUBBLES, RIGHT AXIS) AND WAGES OF COMPLETERS AND LEAVERS (BARS, LEFT AXIS) BY CAREER CLUSTER





Implications for Future Research

Reasons for the large gap between completers' and leavers' earnings within the STEM career cluster. Reasons for higher wages for leavers in the education and training career cluster.

Section IX. Conclusion

With the exception of the education and training cluster, completers earn more in every CTE career cluster. CTE completers and leavers earn more than liberal arts and science completers and leavers, however the difference is more noticeable for completers (17.4 percent vs. 7.4 percent higher, respectively). CTE completers earn 20.6 percent higher wages than CTE leavers and both completers and leavers earn the highest wages in the Science, Technology, Engineering and Mathematics (STEM) cluster (\$47,416 and \$29,887, respectively).

X. WAGES BY PROGRAM OF STUDY (POS)

As discussed earlier, the granular analysis of wages, descending on POS levels, can be used to inform new program planning, existing program modifications, and overall program improvement. Perhaps, more importantly, this information can help establish and maintain an appropriate, healthy balance between industry needs and program enrollment and completion.

This supply and demand balance between a qualified workforce and existing jobs is a key topic for workforce development. Hence, an analysis of POS and related wages, both for completers and leavers, adds to the existing information in this area of research.

As established earlier, the completers with two-year degrees and leavers with comparable (50+ earned technical core credit hours) earned comparable wages: \$32,128 and \$30,301, respectively. Comparisons between CTE two-year degree completers and comparable leavers' demographics and socioeconomic state have been explored as well.

Additionally, per-program earning comparisons have been conducted between two-year CTE degree completers and those leavers who earned 50+ technical core credit hours. The focus on technical core courses is needed because these courses present the occupationally specific set of competencies

required for CTE POS completion. For a valid comparison, the scope of POS was limited to those where both leavers and completers were found during AY15-16. The resulting set consisted of 43 CTE two-year degree (or credit hour equivalent for leavers) programs of study.

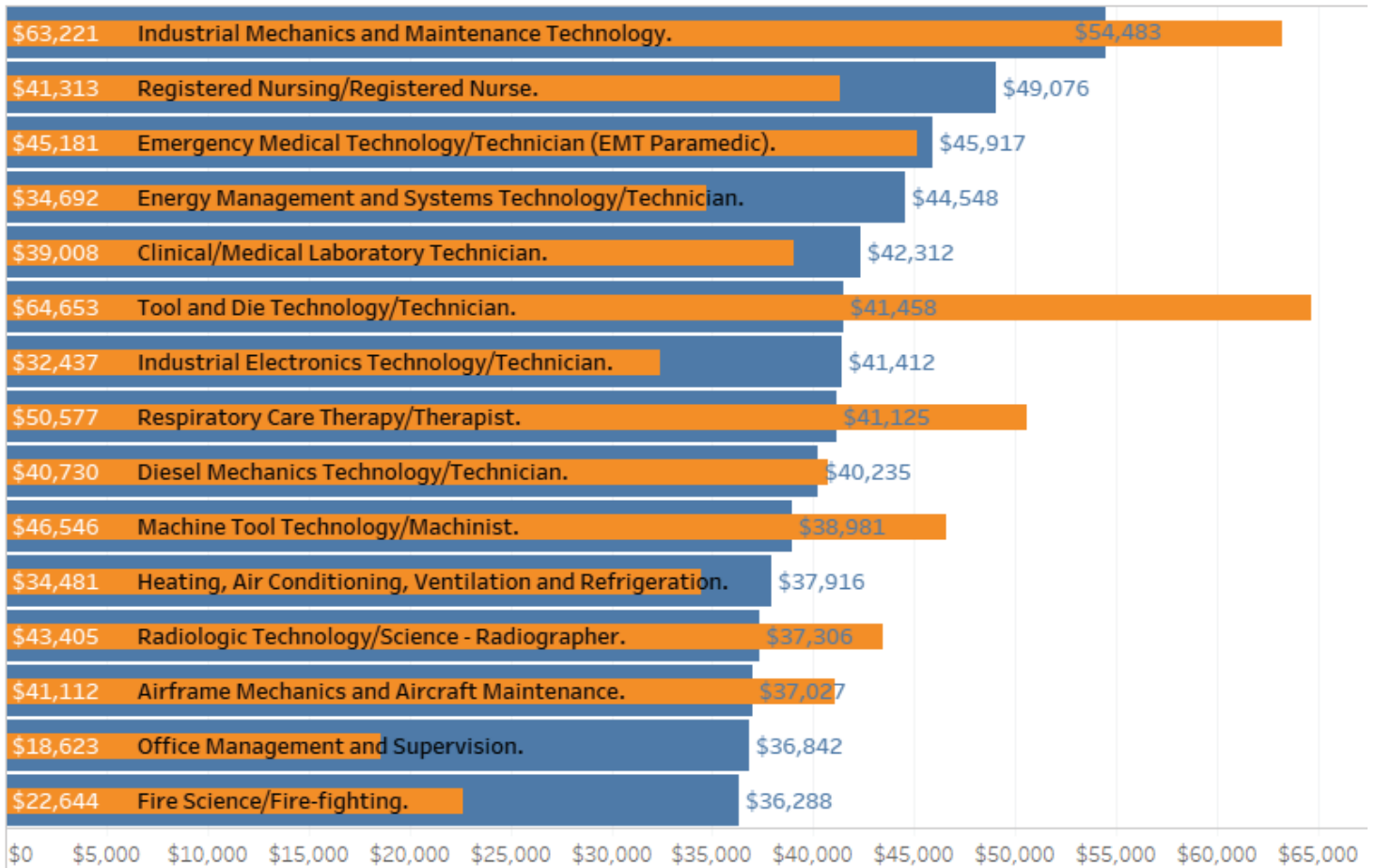
In summary, such concentration allowed researchers:

- a. to create a program-to-program comparative list by including only common POS for leavers and completers;
- b. to focus on the workforce-oriented programs by including CTE POS only; and
- c. to increase the consistency of comparison in terms of the required number of credit hours.

The resulting comparison presented a variety of distributions, with 24 out of the 43 CTE programs demonstrating higher wages for leavers who had completed 60+ technical core courses. Figure 10-1 displays data for top 15 programs by earnings, where programs are represented by the National Center for Educational Statistics (NCES) Classification of Instructional Programs (CIP) numbers. The top earning POS for leavers was tool and die technology, where leavers received a median annual salary of \$63,221, which was higher than the wages earned by completers (\$54,483). Respiratory care and power transmission programs also belong to examples where leavers earned more than completers. Completers earned more than leavers in registered nursing (\$49,076 and \$41,313, respectively), energy management (\$44,548 and \$34,692, respectively), and six other programs in the top 15 (Figure 10-1).



FIGURE 10-1: WAGES OF COMPLETERS (BLUE) AND LEAVERS (ORANGE) BY COMPLETED/ATTEMPTED TWO-YEAR CTE DEGREE POS, TOP 15 PROGRAMS



These statistics allow for the “at-face-value” conclusions that most of the two-year technical degree completers earn smaller wages, compared to those who completed 50+ technical credits. However, a closer look at the components for this ratio computation reveals a number of factors that call for further consideration:

- a. A small number of leavers per program. Within the 24 programs where leavers had higher wages, they comprised on average only 36.2 percent of completers in the same programs. Nine out of these 24 programs were represented by more than 10 leavers; seven programs were represented by fewer than five leavers.
- b. Close to 31.9 percent of leavers in those 24 programs had a previous two-year or higher degree.

- c. The pursuit for validity dictated the limitation of exploring two-year/POS equivalents with both completers and leavers in AY15-16.
- d. Out of 171 unique POS where leavers accumulated over 50 technical core credits, 53 POS were not included in this comparison due to low numbers found in employment (under three, suppressed for employee confidentiality).

All these factors could impact the comparison and deserve further research. However, some programs demonstrated higher wages for leavers while having comparable components. The radiologic technology program, for example, had 71 leavers with a two-year degree equivalent in earned technical core credit hours and 57 two-year degree completers. Among the leavers, there were 15 previous degree holders which might account for the leavers' wages exceeding the completers' by 14.1 percent.



Implications for Future Research

Explore reasons why leavers with comparable educational experience earned more than completers in select POS.

Section X. Conclusion

While leavers seem to demonstrate higher wages in close to 56 percent of the selected two-year CTE programs, there are a number of factors beyond the scope of this analysis that impact such a distribution.

XI. INDUSTRY OF EMPLOYMENT RELATED TO POS

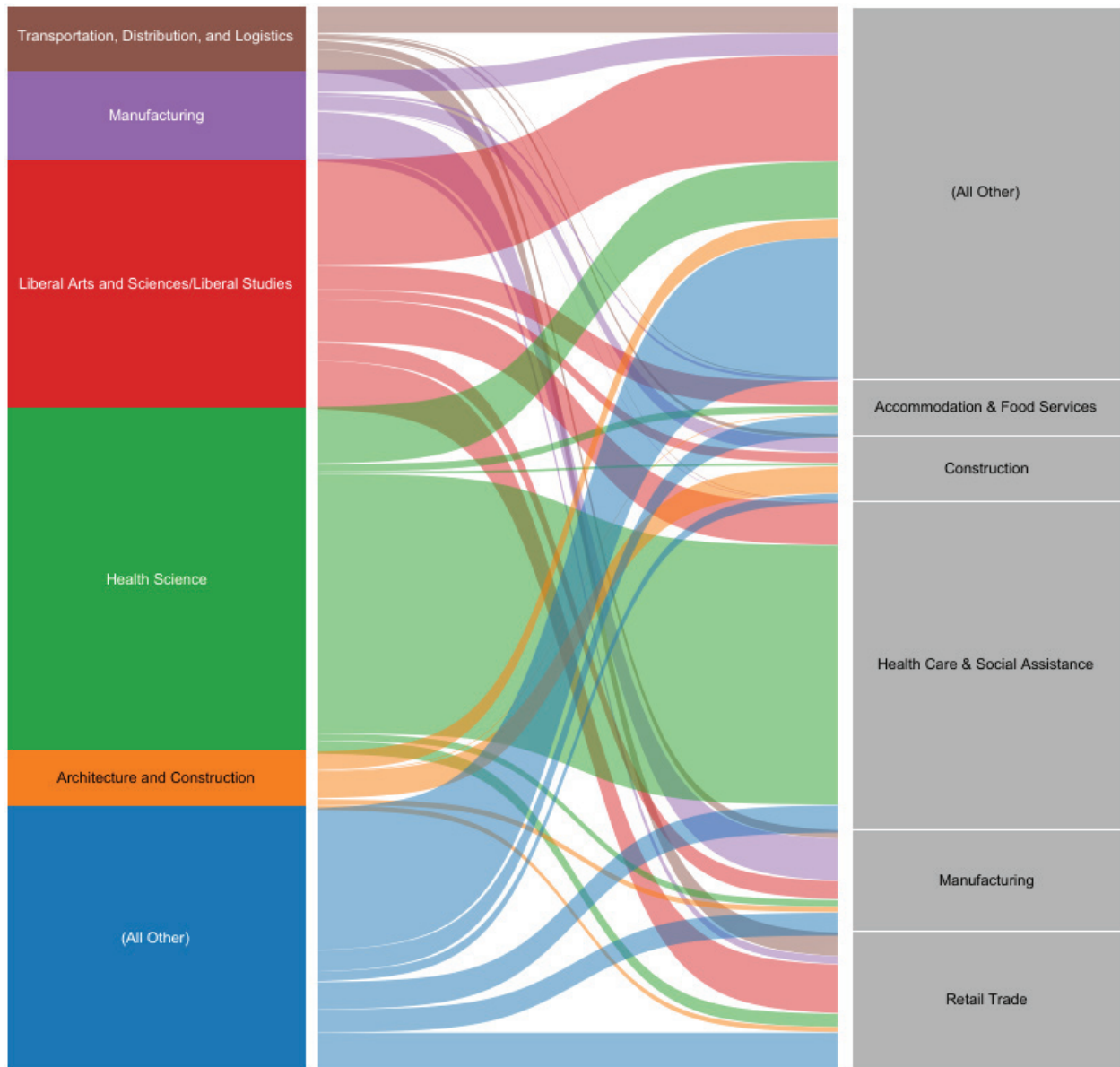
The balance between supply of workers and employment demand has always been both important and hard to achieve. It is critical, therefore, to be able to measure whether students who received training have found employment in relevant occupations. Data availability limitations preclude precise matching of POS to occupations of completers and leavers; however, it is possible to establish the relationships between career clusters of the completers/leavers POS and the industry of their employment. While 20 of the main industry types do not necessarily match each of the 16 career clusters, it is possible to approximate what clusters falls under specific industry types.

Upon analysis, it was found that some POS yielded higher employment rates within corresponding industries than others. In some cases, it is more visibly apparent when a cluster falls into an industry with a higher precision. For example: the health science cluster matches closely to the health care and social assistance industry; the manufacturing cluster contains training programs designed to support the manufacturing industry; the education and training cluster matches perfectly with the educational services industry; and architecture and the construction matches with construction industry. On the other hand, the STEM cluster training programs match a number of industry types and contain a broad variety of training programs which are found in nearly, if not all, industries.

Manufacturing, health care and social assistance, retail trade, and educational service related industries make up the majority of employment in Iowa (761,150 or 48.9 percent) based on data collected at Iowa Workforce Development through the Quarterly Census of Employment and Wages⁷ submitted quarterly by Iowa employers. Due to the ongoing demand of employers across the state in these industries, it is not surprising that those students who completed health science, manufacturing, architecture and construction, or education and training programs, became employed in similar industries at higher rates than in other industries. Though the same logic applies to leavers, however, their concentration in similar industries is higher than that of the completers'. In other words, leavers are employed in industries which are similar to their POS more often than completers. Overall, career cluster to industry of employment frequencies present an intricate picture of many-to-many relationships (Figure 11-1).

Another important assumption to test is the hypothesis that a direct match of POS to industry of employment results in higher wages, compared to employment in less related industries. Divided by 16 career clusters, wages for both completers and leavers were higher, in general, when employment was acquired in the industry that closely matched a career cluster of completed or attempted POS.

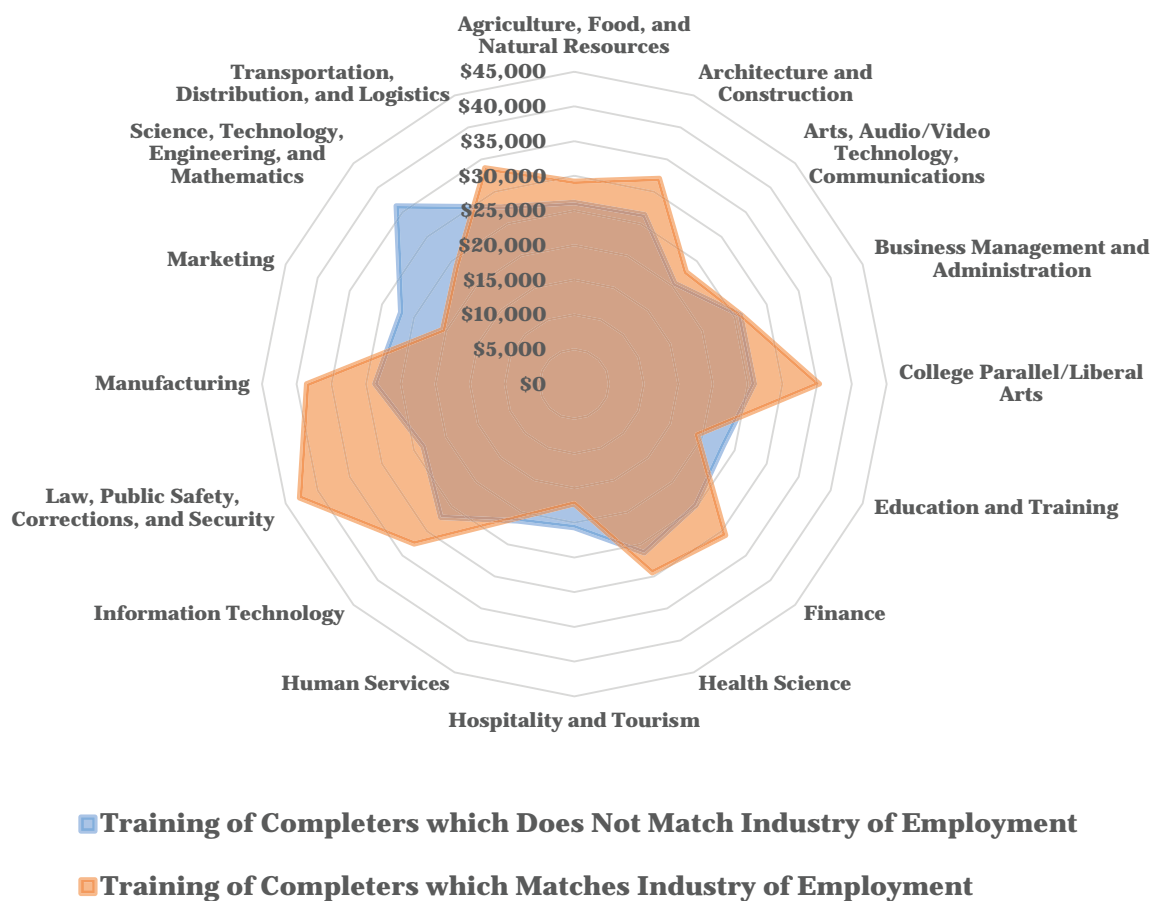
FIGURE 11-1: LEAVERS' CAREER CLUSTERS AND INDUSTRY OF EMPLOYMENT, TOP FIVE CLUSTERS AND INDUSTRIES



*Other clusters and industries are represented in the “All Other” section.

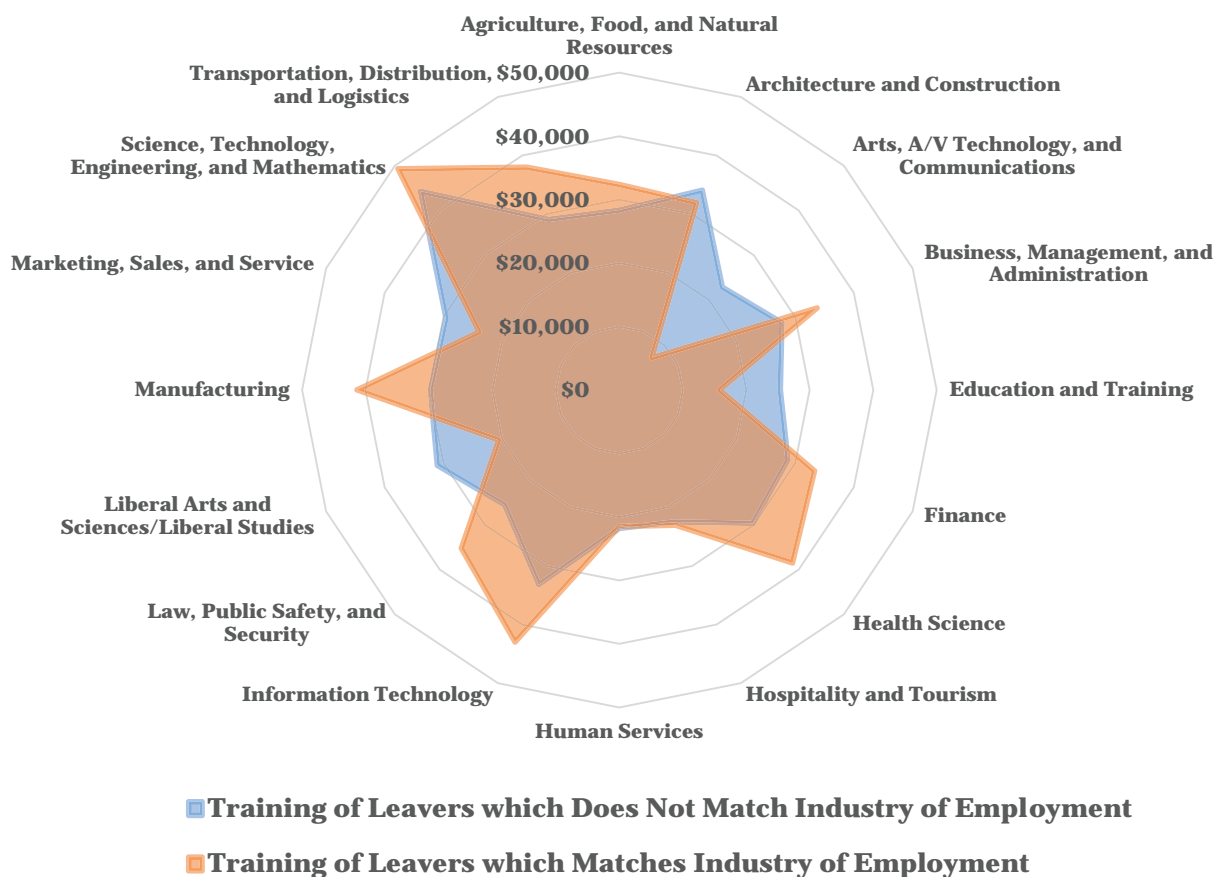
For completers, specifically, the wages were higher in 11 career clusters, with the highest difference (81.6 percent higher) in law, public safety, corrections and security cluster. Where the cluster matched to industry, the annual median wages were \$42,818, while a cluster not matched to industry resulted in only \$23,584. In the remaining five career clusters, employment in directly matched industries actually gained fewer wages. For example, STEM cluster completers showed 33.8 percent lower wages when they employed in STEM-related industries (Figure 11-2).

FIGURE 11-2: COMPARATIVE WAGES OF COMPLETERS WHO EMPLOYED IN THE INDUSTRY OF COMPLETED POS AND THOSE WHO EMPLOYED IN OTHER INDUSTRIES



The leavers earned higher wages in matching industries in 10 out of 16 career clusters, with the highest difference (38.7 percent) in the manufacturing cluster. Out of six cases where the opposite was true, the arts, A/V technology, and communications cluster was the highest, with 68.4 percent lower wages in a matching industry (Figure 11-3).

FIGURE 11-3: COMPARATIVE WAGES OF THE LEAVERS WHO EMPLOYED IN THE INDUSTRY OF COMPLETED POS AND THOSE WHO EMPLOYED IN OTHER INDUSTRIES



Implications for Future Research

Explore correlations between employment in industries of completed/attempted POS and wages of completers and leavers. Explore reasons behind higher wages in other than completed/attempted POS industries.

Section XI. Conclusion

Both completers and leavers demonstrate higher concentration of employment in industries related to completed/attempted POS. Employment in education-related fields result in predominantly higher wages; however, overall distribution of career clusters by industry of employment presents a variety of wage distribution patterns.

CONCLUSION

Studies consistently prove again and again that it pays to graduate. While deeper exploration is desired on numerous anomalies, this analysis supported that notion: students who leave community colleges with awards succeed at higher levels in terms of employability rate and initial wages.

Overall, while completing a postsecondary program of study yields better employment outcomes, it is important to note that not all leavers are behind completers when it comes to employability or transfer. For example, leavers tend to transfer at higher rates, particularly in the arts and science “college parallel” programs. In the community college arena, these students are considered a success because they are continuing their education. However, research shows that completing a degree before transferring has better long term results.⁸

It is also noteworthy to differentiate between students who leave with few credits versus significant educational experience, such as CTE POS leavers with 50+ technical core credits. The latter not only rival completers in their employability and wages, but, in certain occupations, their wages exceed those of the completers. These findings may encourage further study into whether the structure of some programs unintentionally disincentivizes students from completion.

Finally, when researching student success, it is important to recognize that students come to community colleges with a variety of intentions, ranging from transferring to four-year institutions, to learning a new trade, to upskilling to advance in their chosen careers. In many cases, graduation is not an adequate measure of success, so it is imperative that we continue to explore measures aligned with students’ intentions and the value added by their educational experience.

METHODS

Completer/leaver cohort: All students with valid social security numbers (SSN)* who received a credit award during AY15-16 comprise completers' cohort.

Data Processing for the leavers' cohort:

1. All students with valid SSNs* in credit enrollments, with the exception of jointly enrolled for secondary and postsecondary credit (JE, or "still in HS students") are matched to AY15-16 credit awards to exclude those who received awards.
2. Upon excluding students with awards and JE students, the remainder of the group was matched to CC MIS Credit Enrollment data for AY16-17. Students not found in credit enrollments in original community colleges during AY16-17 comprise the leavers' cohort.

Workforce-bound completers/leavers cohort: Completers/leavers cohort was matched to National Student Clearinghouse data for AY16-17. Students not found in postsecondary enrollment during AY16-17 comprise workforce-bound completers/leavers cohort.

Transferring completer/leaver cohort: Completers/leavers cohort was matched to National Student Clearinghouse data for AY16-17. Students found in postsecondary enrollment during AY16-17 comprise transferring completers/leavers cohort.

Establishing leavers' program of enrollment: While the completers program of graduation is reported directly with awards data, some leavers have multiple programs of study, since many of them have been enrolled for multiple terms/years and changed their POS. For the purpose of this report, we select the latest program of study for the students who maintained one POS throughout their presence in a community college. For students with multiple POS we used POS with the greatest number of earned credit hours.

Establishing total earned credit hours: For leavers, latest available data in the Student Information MIS dataset for AY15-16.

For completers, POS of awards matched to approved program master dataset for each college, and total number of credit hours assigned for each award comprises total earned credit hours.

Establishing total number of earned tech core credit hours for leavers:

1. Established POS for each leaver was matched to program master for each POS/college to identify the scope of courses required for each POS as tech core.
2. Completed courses for each leaver were matched to the full scope of required tech core courses for each leaver's POS.

Establishing credit hour equivalent of a two-year degree, a Diploma/Certificate, or short-term Diploma/Certificate for leavers:

1. For high-level comparisons ("award-to-award"), all earned credit hours were distributed as follows:
 - a. Two-year Degree: => 50 earned credit hours.
 - b. Diploma/Certificate (1 year award): 22-49 earned credit hours.
 - c. Short-term Diploma/Certificate (Under 1-year award): 1-21 earned credit hours.
2. For detailed level technical program comparisons, the same range of tech core earned credit hours have been used.

Establishing employments, geography of employment, wages and industry of employment: Workforce-bound completers/leavers were matched to Iowa Workforce Development Unemployment Insurance records for Iowa data, and to Wage Record Interchange System (WRIS) for nation-wide data.

Start dates for tracking have been assigned to each completer (based on award date) and leaver (based on latest course end date). Workforce-bound completers and leavers then have been tracked to the workforce for four consecutive quarters, their wages summarized into an annual format, and reported as median wages for every explored category.

Limitations:

1. UI records may not contain all information, as currently they do not capture self-employed and federally employed workers.
2. Close to three percent of leavers/completers did not provide their SSNs. The leavers' POS depends on a number of circumstances and changes in the community college environment more often than it does in other postsecondary institutions.
3. "Previous Degree in Another College" is a self-reported data elements accepted without documented verification.

**SSNs are being used as the only form of identification acceptable for matching to UI records.*

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