

Program growth and graduate employment outcomes of Washington's applied baccalaureate degrees

Introduction

Washington's community and technical colleges (CTCs) play an important role in producing baccalaureate degree graduates in the state through the applied baccalaureate (AB) degree. The popularity of these degree programs have grown substantially nationwide with 80 community colleges in 17 states currently offering at least one AB program (Community College Baccalaureate Association, 2016). The primary policy goal of these degrees is access to baccalaureate education for students with barriers to further education. Compared to the traditional university student population, community college students are more likely to be working adults with families, low-income, students of color, and place-bound to their geographic area (American Association of Community Colleges, 2016; Bragg & Ruud, 2011; Lane, 2003; Walker, 2001). For many of these students, it is challenging to pursue a baccalaureate program without a four-year institution near home due to conflicting priorities of work and family. In this regard, having a baccalaureate degree program available at a local community college increases the educational attainment opportunity for students who might not be able to pursue one otherwise, thus supporting statewide goals of increased baccalaureate degree production.

The AB degree also provides another educational step for students who have completed workforce-specific professional-technical certificates and associates degrees. These programs are typically considered terminal in that the technical coursework is not designed to transfer into a traditional university baccalaureate degree program. The AB degree addresses this gap through an inverted structure where the higher-order thinking skills traditionally found in a baccalaureate program are taught in the last two years of the degree program (Bragg & Ruud, 2011). Because they are designed to directly help students get jobs, professional-technical degree programs are also typically comprised of older, low-income, first generation, working adults (Association for Career and Technical Education, 2016). Consequently, the AB degree at the community college level fulfills a powerful role in increasing access to higher education for historically underserved populations.

In addition to the benefit of increased access and affordability for students, the AB degree plays an important role in filling gaps in the workforce. As national demand for a more highly educated workforce grows, states are challenged to meet the needs of their local economies with the existing baccalaureate degree capacity. AB degrees at community colleges are viewed as a cost-effective option to meeting this demand. In states such as Illinois, Kentucky, Oklahoma, and Washington where higher education attainment goals are part of overall workforce development, AB degrees at community colleges are a common element in state strategic plans to meet degree production goals (Bragg & Ruud, 2011; Illinois Council of Community College Presidents, 2015).



Washington state's community and technical college system has been offering AB degrees since 2007 and has seen substantial growth over the past ten years of implementation. Each AB program was built upon an existing two-year, terminal technical program offered at the institution. This structure helps increase educational pathways for professional-technical associate graduates who have been limited in their ability to apply credits toward a bachelor degree. As part of the program approval process through the state board for community and technical colleges, colleges demonstrate unmet demand for graduates in the program. The evaluation includes a regional labor market assessment of the need from employers for a specific set of skills and a determination about a lack of graduates from the four-year institutions to fill that need. Earning level (wages) in the given industry are not a factor in determining appropriateness and subsequent state approval for the program. Rather, the primary goal for each of these degrees is to match local employer needs with skilled workers to fill necessary gaps in the workforce.

Prior SBCTC studies have tracked the growth of the programs and student completion and employment outcomes. These studies demonstrate a growth in program diversity, student diversity, high retention and completion rates, and positive employment outcomes for graduates (Kaikkonen, 2015a). Further, compared to similar students with the same associate degree, AB graduates have on average higher employment rates and earnings, but the outcomes vary by program. The outcomes also vary based on prior work experience and other factors unrelated to the degree program (Kaikkonen, 2015b). The following study provides an annual update on program growth and completions and expands upon prior employment outcomes evaluation. This study will further investigate the role of prior work experience and industry change as a factor in earnings and job placement. Specifically, the following research questions are addressed:

1. What is the pattern of program growth?
2. What are the demographics of students in applied baccalaureate degree programs and how have they changed over time?
3. What are the degree completion outcomes for students by program?
4. What are the employment earnings outcomes for students following degree completion? Do the outcomes vary by program?
5. For students who are employed prior to enrollment, do they return to the same industry following degree completion?

Section I. Enrollments, programs, and demographics

Applied baccalaureate programs were introduced in 2007. At the conclusion of academic year 2016-17, 87 programs at 27 colleges have been approved for applied baccalaureate degrees with students enrolled in 52 programs at 22 colleges.

Figure 1 describes the headcount and FTES of all matriculated¹ students in the system through 2016-17. Due to the introduction of several new programs in the past three years, both headcount and FTES continue to grow exponentially. In 2012-13 full-time attendance surpassed part-time as the

¹ "Matriculated" students are those who are in an AB program through meeting admission requirements and under the baccalaureate tuition schedule.

predominant enrollment pattern, which continues to grow as more programs have been added, but at a smaller rate than when the programs first began. Figure 2 shows the annual growth rates in both headcount and FTES between 2007 and 2017. Headcount growth rate continues to outpace FTES, although as of 2017 the rates are becoming more similar at 39 and 30 percent, respectively.

Figure 1. Applied baccalaureate degree FTES and headcount

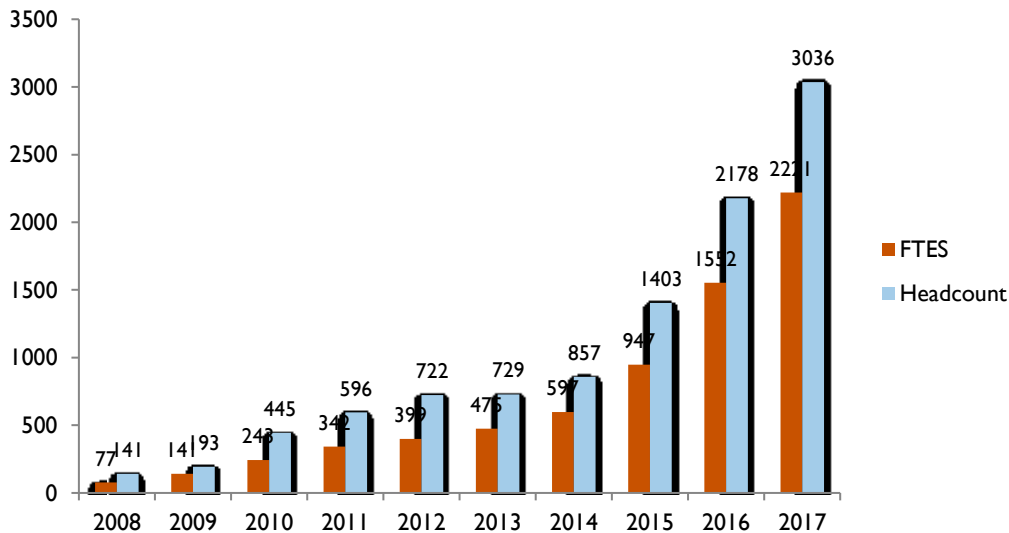


Figure 2. Applied baccalaureate degree FTES and headcount growth

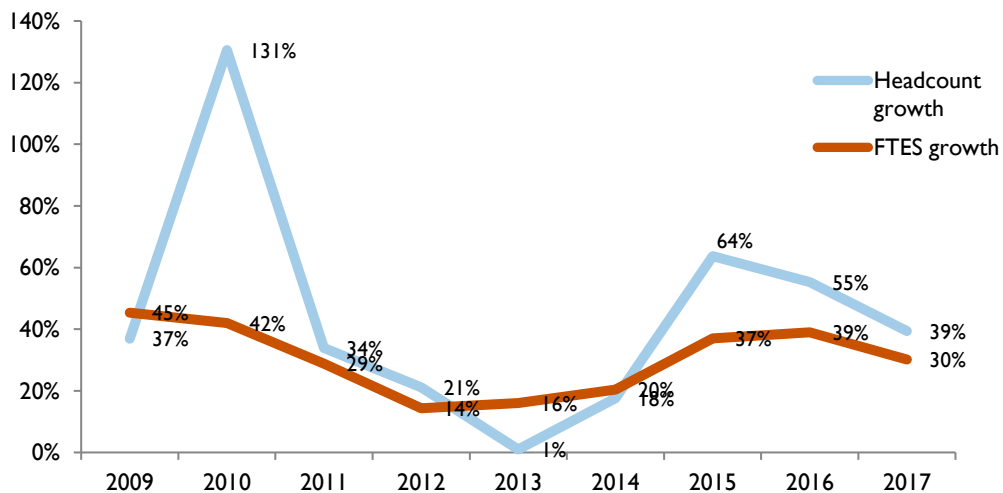


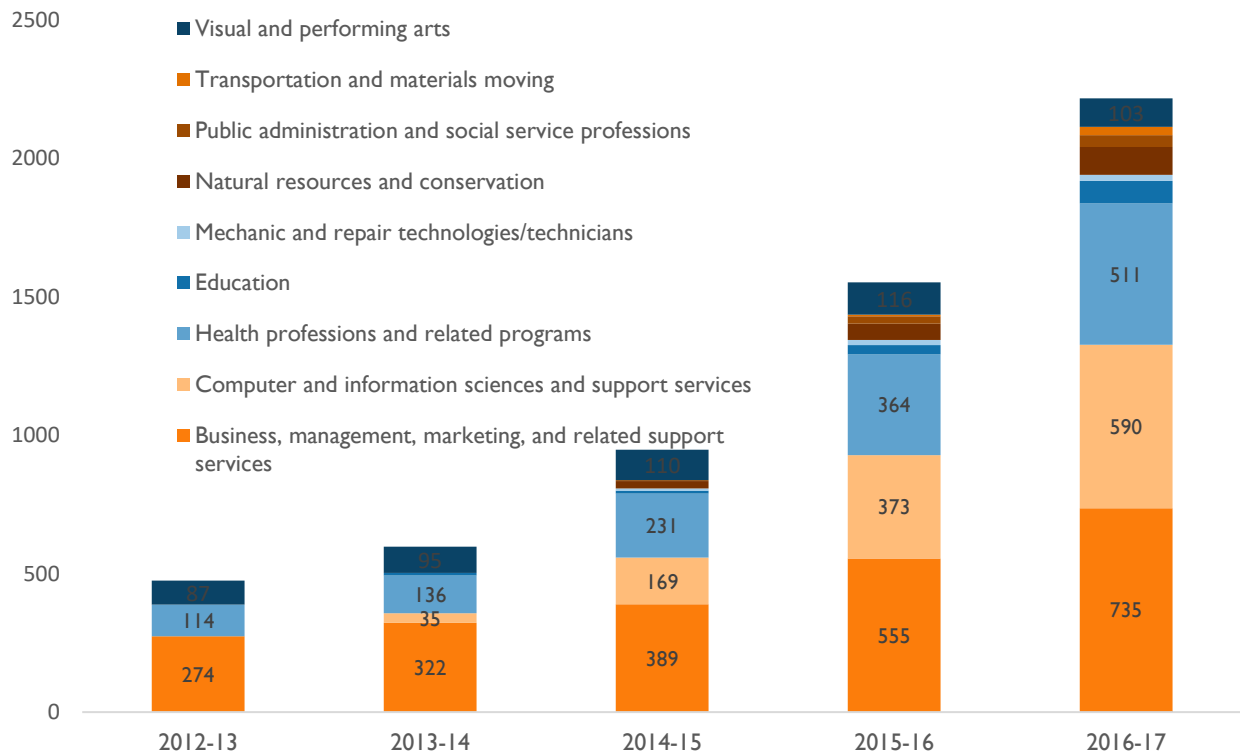
Table 1 and Figure 3 show the growth in program type over the past five years. In 2012-13, five years after the programs started, the enrollment included just business, health, and visual/performing arts programs. By 2014-15, business/management FTES more than doubled, visual and performing arts stayed relatively constant, and health professions FTES doubled in 2014 with the addition of several new nursing programs. Computer and information science programs started in 2013-14 and by 2016-17 FTES

have increased more than ten-fold and is now larger than the health programs. Business programs remain the most heavily enrolled area at 735 annualized FTES in 2016-17.

Table 1. 5 year FTES by program classification

Classification of Instructional Program (CIP)	2012-13	2013-14	2014-15	2015-16	2016-17
Biological and biomedical sciences	0	0	0	0	2
Business, management, marketing and related support services	274	322	389	555	735
Computer and information sciences and support services	0	35	169	373	590
Education	0	9	10	34	81
Health professions and related programs	114	136	231	364	511
Homeland security, law enforcement	0	0	0	0	5
Mechanic and repair technologies and technicians	0	0	9	18	22
Natural resources and conservation	0	0	26	60	100
Public administration and social service professions	0	0	4	26	42
Transportation and materials moving	0	0	0	5	30
Visual and performing arts	87	95	110	116	103
Total	475	597	947	1,552	2,222

Figure 3. 5 year FTES by program classification



Over the past five years student diversity in AB programs increased, but the distribution of race and ethnicity was the same in 2016 and 2017.² Enrollment growth over that time period was most significant for students identifying as Asian, while African American student participation has decreased. As noted in the introductory goals of AB programs, one of the target service populations is place-bound females with family responsibilities. This is demonstrated by females making up more than two-thirds of the students in 2013. However, as new programs have come on board, the diversity in gender has increased. The significant addition of Computer Science programs are a primary driver of this shift with 81 percent male students in those programs. As of 2017 females make up 53 percent of AB students, which is lower than workforce associate degree programs at 56 percent (State Board for Community and Technical Colleges, 2016). All students accepted into applied baccalaureate programs are required to have at least an associate degree. Table 2 shows that the majority of applied baccalaureate students begin the program with an associate degree from a Washington CTC, a figure which has remained relatively consistent over time.

² Students are counted in up to two reported race/ethnicities for the entirety of the report.

Table 2. 5 year demographic summary of applied baccalaureate degree students

Demographic	2013	2014	2015	2016	2017
Race and ethnicity					
Asian	9%	9%	11%	13%	13%
African American	9%	8%	7%	7%	7%
Native American	3%	2%	2%	3%	3%
Hispanic	10%	10%	12%	12%	12%
Other, multi-racial	2%	2%	2%	2%	3%
Pacific Islander	1%	1%	1%	1%	1%
White	67%	68%	65%	61%	61%
Gender					
Female	65%	61%	55%	54%	53%
Male	35%	39%	45%	46%	47%
Age					
	34	34	34	33	33
Prior Education					
Associate degree from WA CTC	65%	68%	69%	69%	67%
Associate from other institution	9%	9%	8%	7%	6%
Bachelor's degree or higher	8%	8%	8%	7%	7%
Other	19%	15%	15%	17%	19%

Section II. Retention and completions

Colleges began graduating students with AB degrees in 2010, three years after the first programs began. The number of graduates has grown substantially each year (Table 3), due in part to high retention rates across the programs. As shown in Figure 4, colleges retained or graduated an average of 87 percent of their fall enrollment by the end of the 2015-16 academic year.

Table 3. Applied baccalaureate graduates by program

College	Program	2012	2013	2014	2015	2016
Bellevue	Applied Arts in Inter. Design	38	37	34	25	33
	Healthcare Technology and Management	*	*	2	10	13
	Information systems	*	*	0	6	12
	Nursing	*	*	*	9	13
	Radiology and Imaging Sciences	13	15	5	13	17
Centralia	Applied Management	*	0	20	28	22
	Diesel technology	*	*	*	*	4
Clark	Dental hygiene	*	*	*	*	20
Clover Park	Operations management	*	*	*	*	6
Columbia Basin	Cyber security	*	*	*	2	13
	Management	17	34	61	34	41
	Project Management	*	*	5	21	21

College	Program	2012	2013	2014	2015	2016
Green River	Information technology	*	*	*	14	37
	Marketing and entrepreneur	*	*	*	*	9
Highline	Cybersecurity and forensics	*	*	*	*	5
	Respiratory care	*	*	*	*	8
Lake Washington	Applied Design	14	16	15	18	26
	Public health	*	*	*	*	16
	Transportation and logistics	*	*	*	*	3
Olympic	Computer information systems	*	*	*	*	7
	Nursing	27	31	28	29	31
Peninsula	Applied Management	14	22	33	23	16
Seattle Central	Allied health	*	*	*	*	32
	Behavioral Science	16	22	25	28	17
Seattle North	Applications development	*	*	*	*	10
	International business	*	*	*	5	11
Seattle South	Hospitality Management	21	21	18	37	16
	Prof tech teacher education and design	*	*	*	7	5
	Sustainable building science technology	*	*	*	*	7
Skagit Valley	Environmental conservation	*	*	*	*	7
Yakima Valley	Business management	*	*	*	*	23
System Total		160	198	246	309	501

Figure 4. Fall to spring retention or completion by program

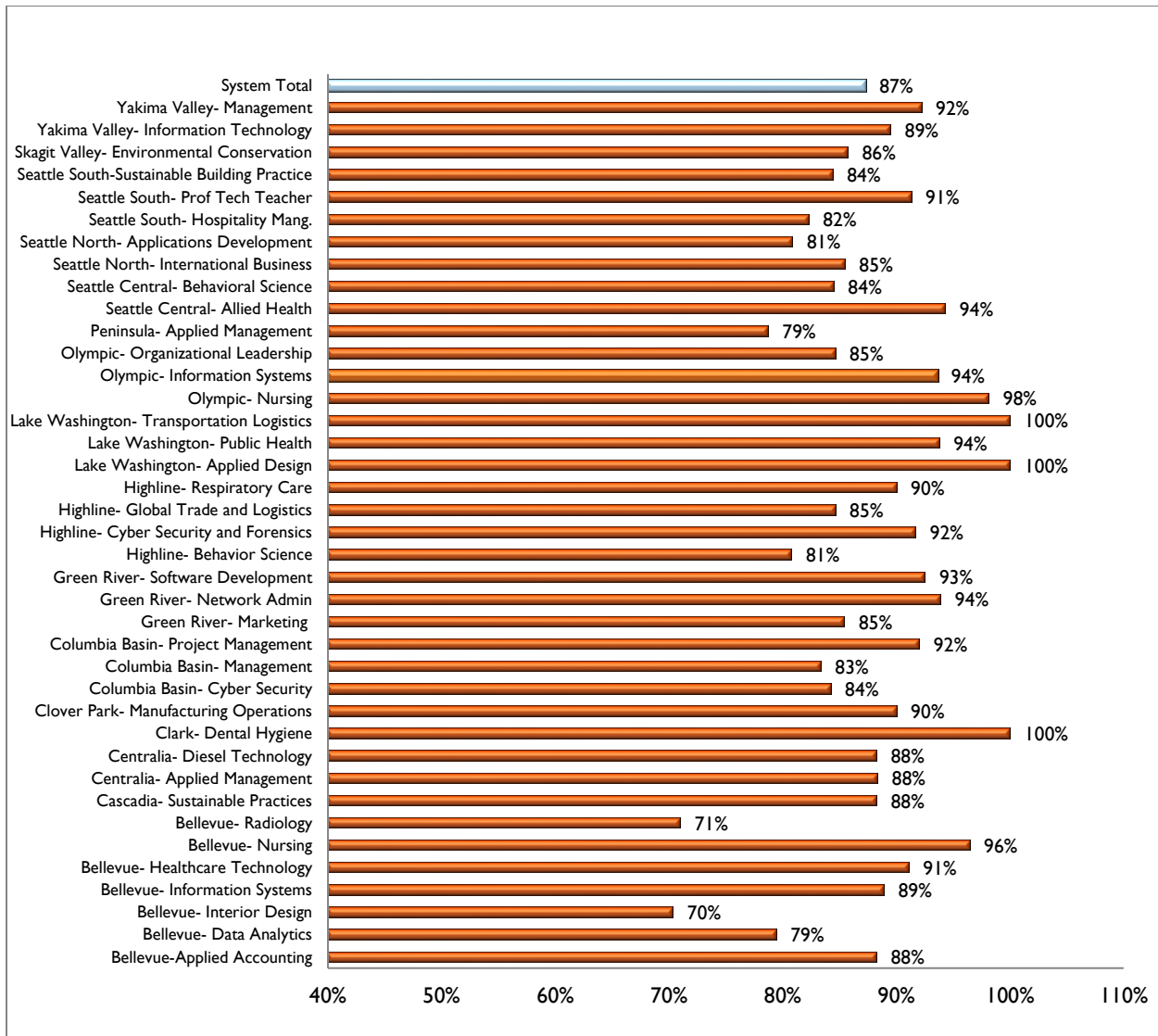
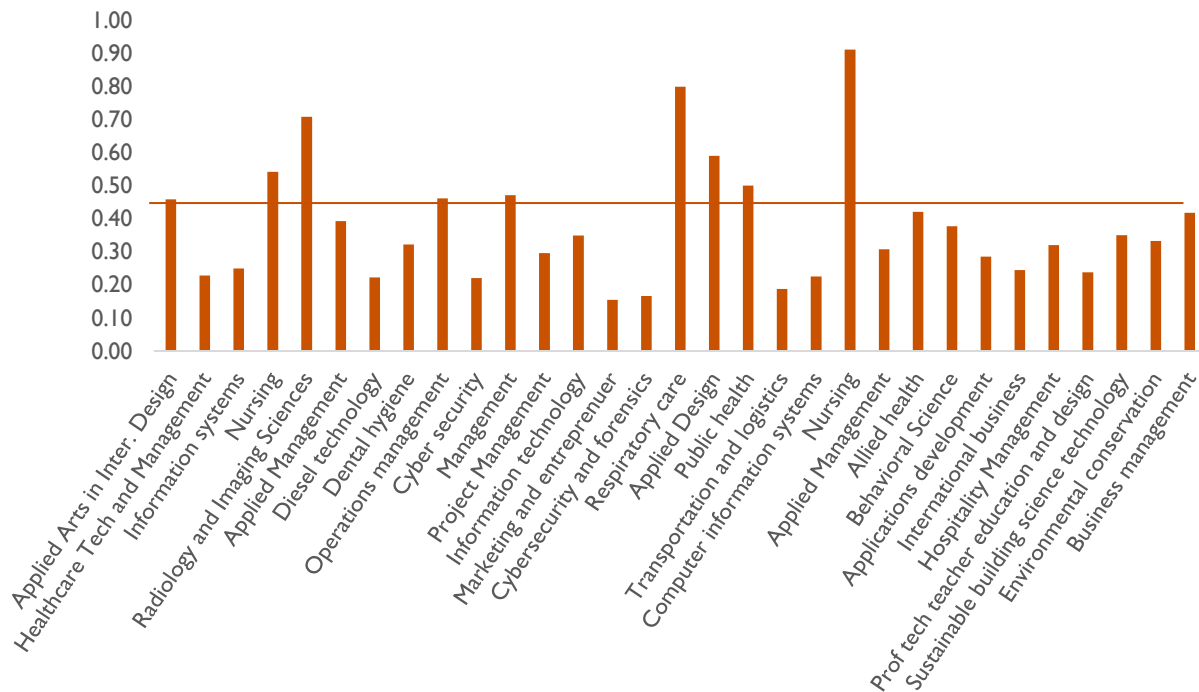


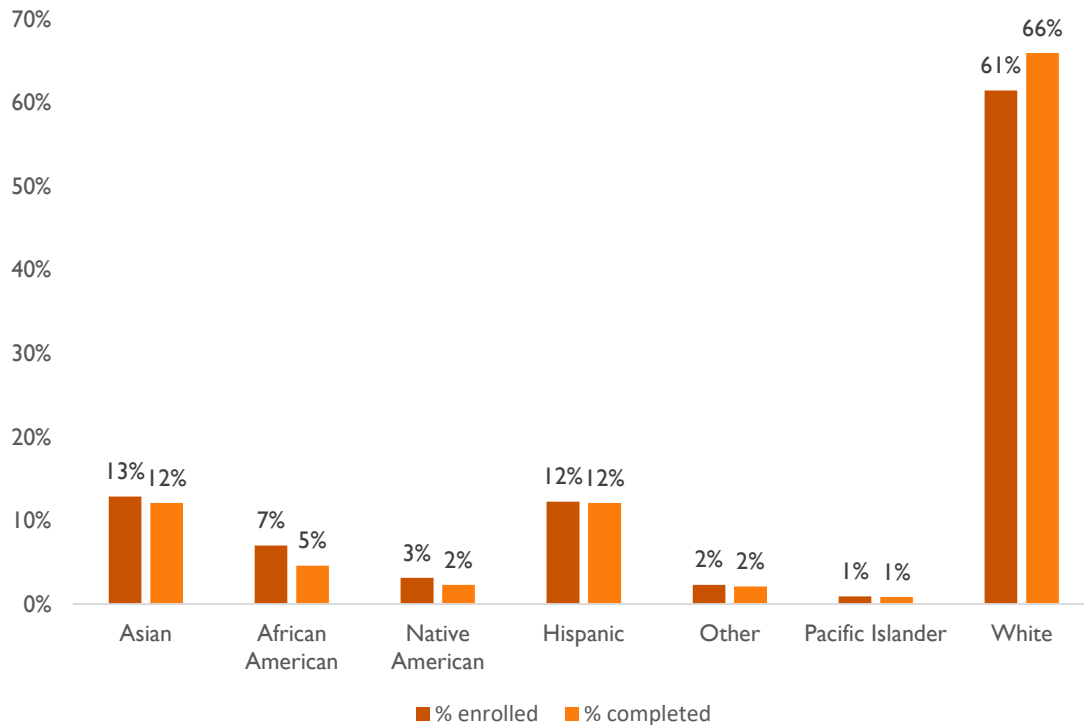
Figure 5 displays the completions per FTE for each program in 2015-16. This measure is an indication of the rate students complete the program out of those who enrolled. FTE accounts for the full- and part-time mix, although as discussed earlier the majority of students in AB programs attend full-time. In concept, if a program is approximately two years in length and students attended full-time, half of the enrolled students would finish each year (completion ratio of 0.50). According to the data in figure 5 there is a wide range on this metric across the colleges and programs. The majority of programs that are above 0.50 are healthcare related programs that have been in place for several years, where the lower ratio programs are mostly new ones.

Figure 5. Completions per FTE



Equity of outcomes for students, particularly with the expansion of the workforce mission into AB degrees, is an important community and technical college policy goal. High retention and completion rates as well as diversity in participation make a compelling case for the positive contribution AB programs have on baccalaureate educational attainment in Washington. However, as demographics continue to shift, attainment for historically under-represented groups is critical. Figure 6 shows the breakdown of race and ethnicity by both enrollment and completion. As a measure of parity, these percentages would be equivalent. The data shows that white students are overrepresented in the completion cohort as compared to enrollment. Asian students are slightly underrepresented and African American students show a 2 percent difference between enrollment proportion and completion. Colleges should pay careful attention in particular to African American student’s experience as this group has seen a decline in enrollment over the past several years (Table 2). This in combination with less completions suggests an opportunity for improvement with respect to the applied baccalaureate degree program adequately meeting the needs of those students.

Figure 6. Enrollment and completion distribution by race and ethnicity



Section III. Post Program Employment Impacts

As stated in the introduction, the key policy goals of the AB degree in Washington state are to increase educational attainment for students and meet employer demand. The two are linked concepts, in that if students are not able to secure employment at a living wage following degree completion then the viability of the program might not be sustainable. This is a key evaluation consideration for AB programs, both those already in place, but even more importantly for those colleges who are working on establishing new programs. Earnings level is not a factor for program approval, but is an important aspect of the student experience. This is particularly germane to the applied baccalaureate degree, which by definition builds upon an existing workforce-related associate degree, which are designed to put students directly to work.

Prior research shows a strong link between education level and earnings. The results vary by program with STEM fields generally outpacing other fields and education falling towards the lower end of the earnings (Carnevale, Cheah, & Hanson, 2015; Webber, 2016). Bahr (2014) and Xu and Trimble (2016) found that while certificate holders typically earn less than associate degree graduates, those with a strong alignment to labor market skills result in higher earnings than general fields. Prior SBCTC research (Kaikkonen & Quarles, 2017) has shown this to be the case in applied baccalaureate programs as well. The following analysis looks at employment rate and earnings by program over time as well as a brief description of the industry of employment. This will lend insight into how graduates are faring as they earn baccalaureate degrees and if they are in fact employed in fields for which they were trained.

This is a system-wide look at immediate and longer term employment outcomes by program area. Graduates from all applied baccalaureate programs were matched against unemployment insurance (UI) records from the Washington state Employment Security Department (ESD). Pre-enrollment earnings (3

quarters prior to first quarter start) is included as a baseline for earnings growth over time. The maximum, inflation-adjusted, annualized, median earnings are captured for each subsequent year following graduation. Reporting rules require that outcomes not be reported for any group less than 10, therefore individual college programs are combined at the 2-digit CIP level to ensure a large enough sample for analysis. Further, younger programs whose graduates have not been in the workforce long enough to capture a given subsequent year earnings are excluded, as notated in Tables 4 and 5. A final caveat is that any graduate-level education is not considered in the long term earnings analysis, which if present would also account for earnings levels beyond the AB degree.

Table 4. Employment match rate over time by program classification

Program*	Graduate total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Business, management, marketing	739	86%	86%	79%	83%	86%	83%	85%	82%
Health professions and related programs	565	87%	89%	85%	87%	87%	89%	96%	100%
Visual and performing arts	310	81%	86%	75%	74%	73%	68%	53%	-
Computer and information sciences and support services	134	84%	86%	-	-	-	-	-	-
Education	14	100%	-	-	-	-	-	-	-
Natural resources and conservation	17	53%	-	-	-	-	-	-	-
Total	1,779	85%	87%	80%	82%	83%	82%	85%	92%

*Programs with 10 or more graduates

As shown in Table 4, overall the employment match rate is strong for AB graduates but there are differences by program. The Education program, with only one year of graduates in the time span for analysis, had a 100 percent match rate. Natural resources, which also had only one year, showed a very low match rate of just 53 percent; however, there were only 17 graduates in the analysis cohort. The health professions program shows a high rate consistently over time, to include all the way out to years seven and eight at 96 and 100 percent, respectively. These rates provide some background context for the information in Table 5, which is median earnings by program at pre-enrollment and years one through eight post-graduation.

The median earnings by program over time are represented in Figure 7 and Table 5. Figure 7 demonstrates two things. First, for each program, the earnings increase with each passing year beyond pre-enrollment earnings. The visual and performing arts program (which includes both interior design and hospitality management) shows an up and down pattern, which is consistent with an up and down and relatively low employment match rate. The nature of the work from this program may play a role in these inconsistent earnings and employment rates over time, which will be studied in further detail in the next section.

Second, there are differences by program. One observation, which on the surface does not align with prior research, is the Education program that shows the highest earnings in year 1. The earnings are

higher than computer science, a STEM field well known to be associated with high earnings. However, by year 2, the computer science earnings were equivalent to those in the health sciences so an assumption is over time it will follow a similar upward trajectory. The Education program also shows the highest pre-enrollment earnings, by a significant amount. Along with the 100 percent employment rate, this suggests that the AB graduates in Education were likely current teaching professionals who had been working for several years. Of the three programs with enough graduates to look over an eight-year time period (business, health, and visual arts), the health professions program shows the highest earnings in each year over time to the eight-year mark. By the eighth year, the only represented program is nursing, which shows a 100 percent match rate and a median earnings amount of approximately \$92,000. This suggests long term positive employment impacts of this applied baccalaureate degree program.

Figure 7. Median earnings from pre-enrollment to eight years after completion

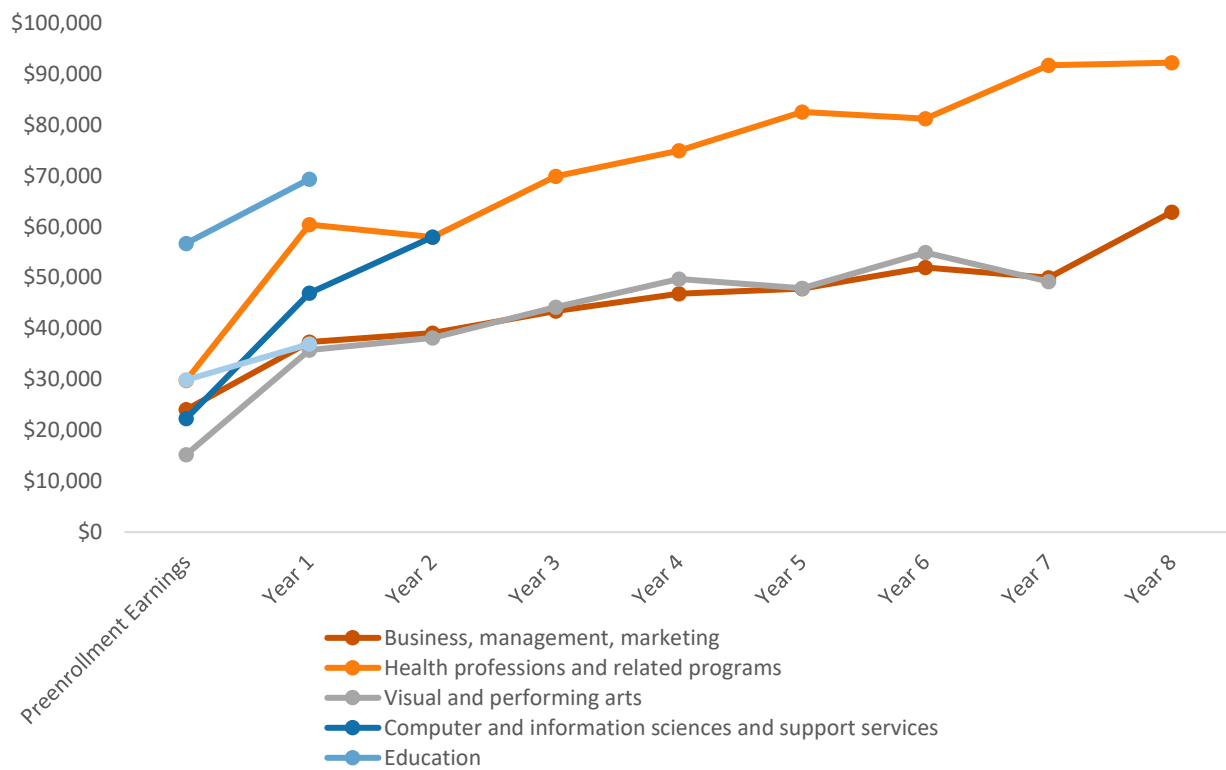


Table 5. Median earnings from pre-enrollment to eight years after completion

Program	Graduate total	Number with pre-enrollment earnings	Pre-enrollment earnings	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Business, management, marketing	739	497	24,040	37,344	39,112	43,452	46,840	47,824	51,968	49,952	62,874
Health professions and related programs	565	330	29,804	60,400	57,948	69,868	74,886	82,496	81,176	91,680	92,192
Visual and performing arts	310	170	15,212	35,784	38,152	44,180	49,706	47,870	54,900	49,182	*
Computer and information sciences and support services	134	62	22,278	46,954	57,948	*	*	*	*	*	*
Education	14	12	56,712	69,326	*	*	*	*	*	*	*
Natural resources and conservation	17	9	29,888	36,924	*	*	*	*	*	*	*
Total	1,779	1,080	23,356	42,638	44,600	48,564	52,544	58,560	63,072	76,124	87,364

The final section of this study discusses the industry of employment, both prior to enrolling in the AB program and in the years after graduation. Table 6 shows industry information for business, health, visual and performing arts, computer sciences, and education. The natural resources program is excluded because of the small sample size and reporting rules around employer counts. The table includes the top three most common industries prior to enrollment and in the year after graduation. The percent of graduates who are still employed in the same industries at year 1 are also included, in addition to year 4 for the longer term programs.

In the Education programs, the most common pre-enrollment industry was colleges/junior colleges, with 50 percent employed in that field. The most common after graduation was junior colleges with 57 percent, with 75 percent employed in the same industry at year 1 as before enrolling. Given the strong employment rate and earnings as noted above, it appears that this degree helped these graduates in a professional development sense and likely not as much to obtain new employment. The health professions program showed a similar pattern of the majority of pre-enrollment clustered into hospitals and nursing care facilities, but also restaurants. The latter industry likely represents students working part-time while going to school. Following graduation, hospitals, dentist offices, and physicians were the most common types of employer, with 52 percent employed in those industries and 49 percent employed in the same industry in year 1 as pre-enrollment. At year 4, 22 percent are still employed in the same specific industry in as in year 4 as they were in year 1.

The computer science programs had more variation in pre-enrollment industry in that one of the most common was temporary services (help), and only 31 percent were employed in the top 3 most common industries. One year post-graduation one of the most common industries shifted to computer programming services, but temporary services was still a top 3. However, only 26 percent of graduates were clustered in the top three industries and just 17 percent were employed in the same industry in year 1 as pre-enrollment. This indicates that graduates are employed in a wide range of industries and that there is not a strong link between pre-enrollment industry and post-graduation. The median age for graduates in this program is 28 (compared to 33 for AB as a whole), which suggests that, unlike in the Education program, students are likely training for a first career in the industry.

In the interior design and hospitality programs (visual performing arts), the most common pre-enrollment industries were restaurants/snack bars and supermarkets with 23 percent of graduates clustered in those professions. At one year post-graduation, the most common industries shift to architectural and interior design, and temporary services (help). Thirty-four (34) percent of graduates are employed in these top industries, the majority of which align with the degree program interior design. Just 25 percent of graduates are employed in the same industry as pre-enrollment and at year 4 it is 21 percent. The earnings information in Tables 4 and 5 indicate a relatively high match rate in year 1, but earnings are somewhat low. Given that plus the relatively low number of graduates employed in the field in year 1, it is hard to say that employment prospects for these degree programs are particularly strong. To better understand the institutional effectiveness and impact of the program on students, the colleges offering these programs should engage in a deeper evaluation of the program's outcomes. An institutional research perspective, to include graduate surveys, would lend insight into the program's effectiveness and whether these programs are still serving a fundamental labor force and student need. This information is imperative in order to make improvements in the best interest of students and employers, as well as to continue to grow AB programs as a whole (Bragg & Soler, 2016).

Business, which is one of the original AB programs, has the largest number of graduates and shows a lot of variety in industry. The most common pre-enrollment industries include restaurants, junior colleges, and hotels, yet only 16 percent of students are clustered in those industries. One year following graduation hotels and junior colleges are still the top industries as well as engineering services. Only 18 percent of graduates are clustered in these industries, but 46 percent are employed in the same industry at year 1 as at pre-enrollment. At year 4, just 19 percent of graduates are employed in the same industry as in year 1. This suggests a significant amount of variation in occupations for these graduates. This is not surprising given that business is a general field that can cut across several industries and it is challenging to speculate the effectiveness of the specific program on employment attainment. Similar to the other programs, the colleges offering this degree should engage in additional evaluation activities to determine how well it is meeting both student and employer need.

Table 6. Industry of employment by program

Program	Top 3 industries pre-enrollment	% in most common industry	Top 3 industries year 1	% employed in most common industry year 1	Percent employed in same industry in year 1 as pre-enrollment	Percent employed in same industry year 4 as year 1
Business, management, marketing	Full service restaurants, junior colleges, hotels	16%	Hotels, junior colleges, engineering services	18%	46%	19%
Health professions and related programs	Hospitals, nursing care facilities, full service restaurants	46%	Hospitals, office of dentists, office of physicians	52%	49%	22%
Visual and performing arts	Full service restaurants, snack and non-alcoholic beverage bar, supermarket and other grocery	23%	Architectural services, interior design services, temporary services	34%	25%	21%
Computer and information sciences and support services	Temporary services, aircraft manufacturing, junior colleges	31%	Computer programming services, temporary services, junior colleges	26%	17%	*
Education	Colleges/Universities/Junior colleges	50%	Junior colleges	57%	75%	*

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