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August, 2015

## Applied Baccalaureate Degrees: Policy and Outcomes Evaluation

### Introduction and purpose of study

Washington's community and technical colleges (CTCs) play an important role in producing baccalaureate degree graduates in the state. Applied baccalaureate degrees expand opportunities for both graduates and employers by providing the upper-division coursework in an applied field. These degrees build upon professional-technical associate degrees. Applied baccalaureate degrees developed at CTCs provide a clear pathway for students who may be place bound or have difficulty finding a transfer opportunity for their associate degree. Applied baccalaureate degrees also help address employers' need to successfully recruit qualified applicants who have both job-specific technical skills as well as the skills learned through a baccalaureate program.<sup>1</sup> In addition to serving the needs of employers, applied baccalaureate programs are beneficial to employees already working in technical fields who wish to be promoted to higher level management or to specialized positions which may require a bachelor's degree.

Applied baccalaureate degree programs are approved through the Washington State Board for Community and Technical Colleges (SBCTC) to achieve the following policy goals:

1. Increase educational pathways for professional-technical associate graduates who have been limited in their ability to apply credits toward a bachelor degree. The workforce student population is comprised of a large portion of people of color, older working adults and people (primarily women) who are place bound with family responsibilities.
2. Meet state goals for increasing the total number of baccalaureate degrees awarded by public two-year and four-year institutions to 42,400 per year. To do this, the CTC system will need to increase the number of students who transfer to baccalaureate programs by 25 percent and increase the number of applied baccalaureate graduates to 1,400 by the year 2030.<sup>2</sup>
3. Expand the workforce mission of CTCs further to better serve the needs of local and state employers.

The following study is an evaluation of the CTC system's progress towards meeting the above policy goals.

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<sup>1</sup> Workforce Training and Education Coordinating Board, *Employer Survey 2004*.

<sup>2</sup> Washington State Board for Community and Technical Colleges, *Mission Study 2008*.



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## Executive summary

In 2014-15, CTCs enrolled 947 full-time equivalents (FTE), 1,403 headcount enrollments in 35 applied baccalaureate programs in 15 colleges. This is a significant increase from four programs and 77 FTEs, 141 headcount enrollments in 2008, the first year programs were offered. The applied baccalaureate mix has increased beyond business and management with the addition of more healthcare, computer and information technology, and natural resources and conservation degrees. These were created in response to demand from local employers. Student diversity in applied baccalaureate programs has increased over time and the gender gap is decreasing. Asian/Pacific Islanders and Hispanic students represent a larger share of the enrollment than when the programs first began. The percent of males has also increased as programs have been added at the technical colleges and with the significant expansion of computer and information technology programs. The majority of students begin their baccalaureate studies already having earned an associate's degree from a Washington community or technical college (CTC).

The number of graduates in applied baccalaureate programs has increased nearly fivefold from 52 in 2010 to 246 in 2014. Colleges retained or graduated an average of 81 percent of their fall enrollment by the end of the academic year. The retention rate has increased over time because more students are attending full-time. Through the coupling of growth in program offerings and enrollment, resultant completion rates indicate the applied baccalaureate programs are positively contributing to baccalaureate production in the state and are on track to meet the 2030 goal of 1,400 completions. In most programs, students of color are participating in applied baccalaureate programs at an equivalent or higher rate than in colleges' workforce programs in general; however, not all colleges show students of color as earning degrees at a rate equivalent to their participation rate. This suggests a possible area for focus and improvement.

The employment outcomes section of this report (see companion report "15-3: Post Program Earnings Differences Between the Associate in Applied Science and Applied Baccalaureate Degrees" for full study) sought to answer the questions a) does having an applied baccalaureate degree result in higher earnings than the associate degree alone b) does the return to investment in earnings differ by field of study, and c) do the target populations for applied baccalaureate degrees (historically underserved students) benefit from applied baccalaureate degrees in the same way as their peers?

The analysis compared student earnings in each applied baccalaureate degree program to students who earned the same type of associate degree as their applied baccalaureate counterparts, but who had not gone on to complete the bachelor's program. The analysis compared 281 applied baccalaureate graduates (an 84 percent employment match rate) and 1,771 associate degree graduates (a 70 percent employment match rate), descriptively showing higher employment for the former. Employment matching was only done within Washington state and may therefore under-represent actual employment for both groups.

The earnings comparison between groups demonstrate that having a baccalaureate degree is a worthwhile return on the time and money investment above and beyond an associate degree for most programs. Rigorous evaluation showed applied baccalaureate students had higher earnings (average difference of \$3,700 to \$27,000 annually depending upon the program) than their comparison associate degree graduates. In all but two of the programs the impact of the baccalaureate degree on subsequent earnings was statistically significant. In addition, earnings differences were not affected by students' race/ethnicity, meaning there were no significant equity gaps and the targeted groups for applied baccalaureate degrees benefit in the same way as their peers. However, gender was a factor above and beyond the baccalaureate degree in both the Radiology and Applied Design (Lake WA) programs, where males have higher earnings, suggesting potential gaps in STEM fields.



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## Section I. Enrollments, programs, and demographics

Applied baccalaureate programs were introduced in 2007. At the conclusion of academic year 2014-15, 52 programs at 23 colleges have been approved for applied baccalaureate (Tables 1 and 2), with students enrolled in 35 programs at 15 colleges (Table 1).

**Table 1: Current program offerings**

College	Program
Bellevue College	Radiation and Imaging Sciences, Interior Design, Health Care Technology and Management, Nursing, Information Systems and Technology, and Data Analytics
Centralia College	Applied Management, Diesel Technology
Clover Park Technical College	Manufacturing Operations
Columbia Basin College	Applied Management, Cyber Security, Project Management
Green River College	Information Technology (Network Administration and Security; Software Development), Marketing and Entrepreneurship
Highline College	Cyber Security and Forensics, Global Trade and Logistics, Respiratory Care, Applied Behavioral Science- Youth Development
Lake Washington Institute of Technology	Applied Design, Transportation and Logistics Management, Public Health
North Seattle College	International Business, Application Development
Olympic College	Nursing, Information Systems
Peninsula College	Applied Management
Renton Technical College	Application Development
Seattle Central College	Applied Behavioral Science, Allied Health
Skagit Valley College	Environmental Conservation
South Seattle College	Hospitality Management, Professional Technical Teacher Education, Sustainable Building Technology
Yakima Valley Community College	Applied Business Management

**Table 2: Approved upcoming programs**

College	Program
Bellevue College	Applied Accounting (Fall 2015), Molecular Biosciences (Fall 2016)
Cascadia College	Sustainable Practices (Fall 2015)
Clark College	Dental Hygiene (Fall 2015)
Columbia Basin College	Nursing (Fall 2016)
Grays Harbor College	Organizational Management (Fall 2015)
Grays Harbor and Green River Colleges	Forest Resource Management (Fall 2015)
Green River College	Aeronautical Science (Fall 2016)
Olympic College	Organizational Leadership and Technical Management (Fall 2015)
Pierce College	Dental Hygiene (Summer 2016)
Seattle Central College	Nursing (Fall 2015)
Spokane Falls Community College	Information Systems and Technology, Applied Management (Fall 2015)
Tacoma Community College	Health Information Management (Fall 2016)
Wenatchee Valley College	Nursing (Fall 2015)
Whatcom Community College	Information Technology (Fall 2017)
Yakima Valley Community College	IT Networking (Fall 2015)

Figure 1 on the next page shows the headcount and FTE of all matriculated<sup>3</sup> students in the system through 2014-15. With the introduction of seven new programs in 2013-14 and 18 new programs in 2014-15, both headcount and FTES increased substantially in the last year. In 2012-13 full-time attendance (Figure 2) surpassed part-time as the predominant enrollment pattern, which continues to grow as more programs have been added but at a smaller rate than when the programs first began. Headcount continues to outpace FTE in growth. Figure 3 shows the annual growth rates in both headcount and FTE between 2007 and 2015.

<sup>3</sup> “Matriculated” students are those who in a BAS program through meeting admission requirements and under the baccalaureate tuition schedule. Additional FTE are served to students not in a program, but who take upper division courses.

Figure 1

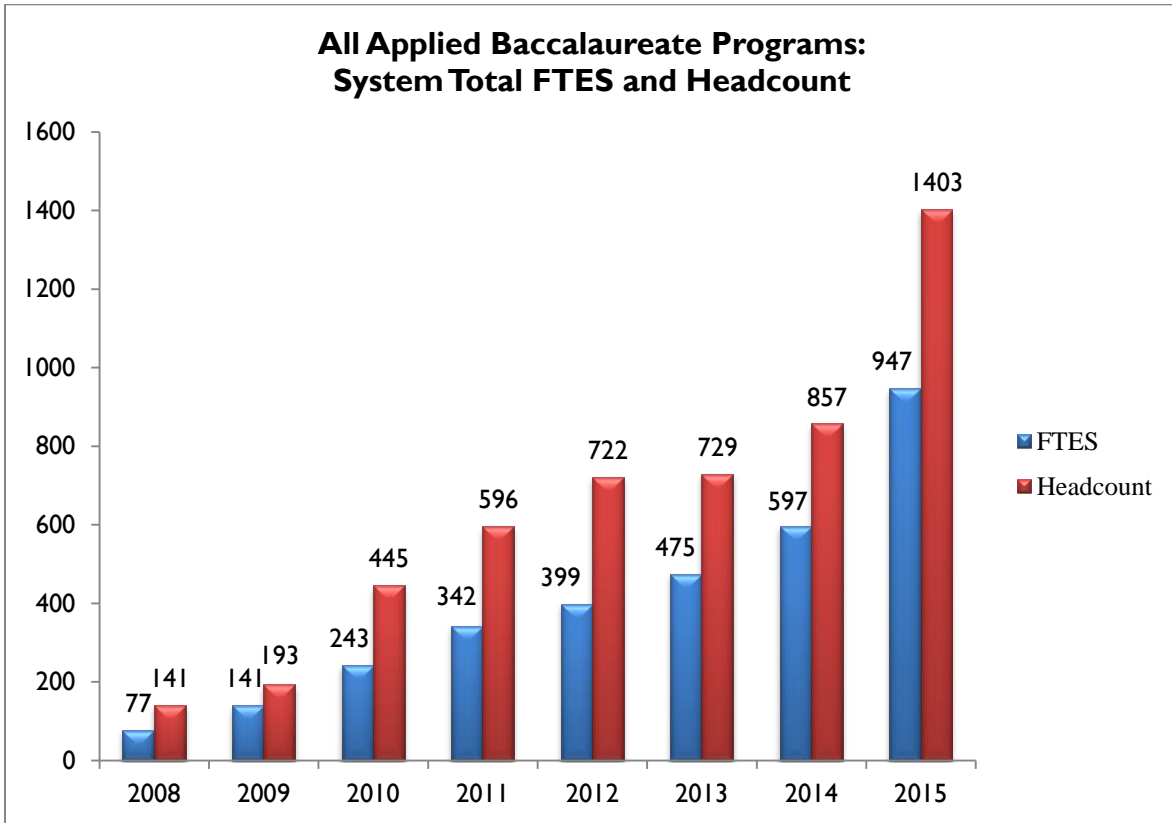
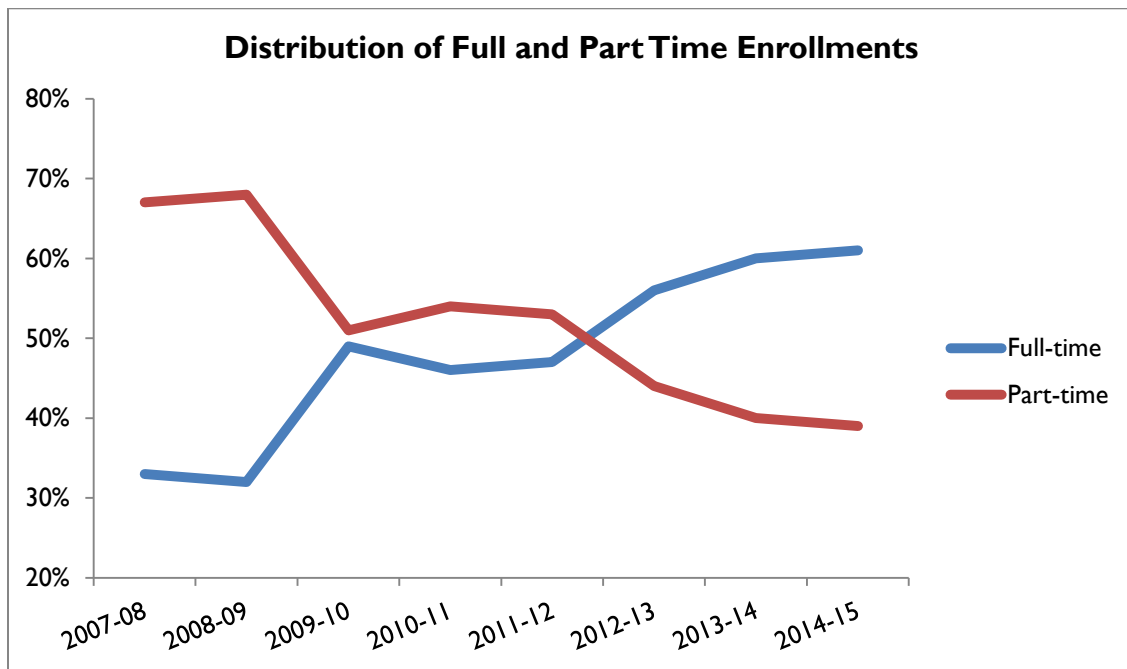


Figure 2



**Figure 3**

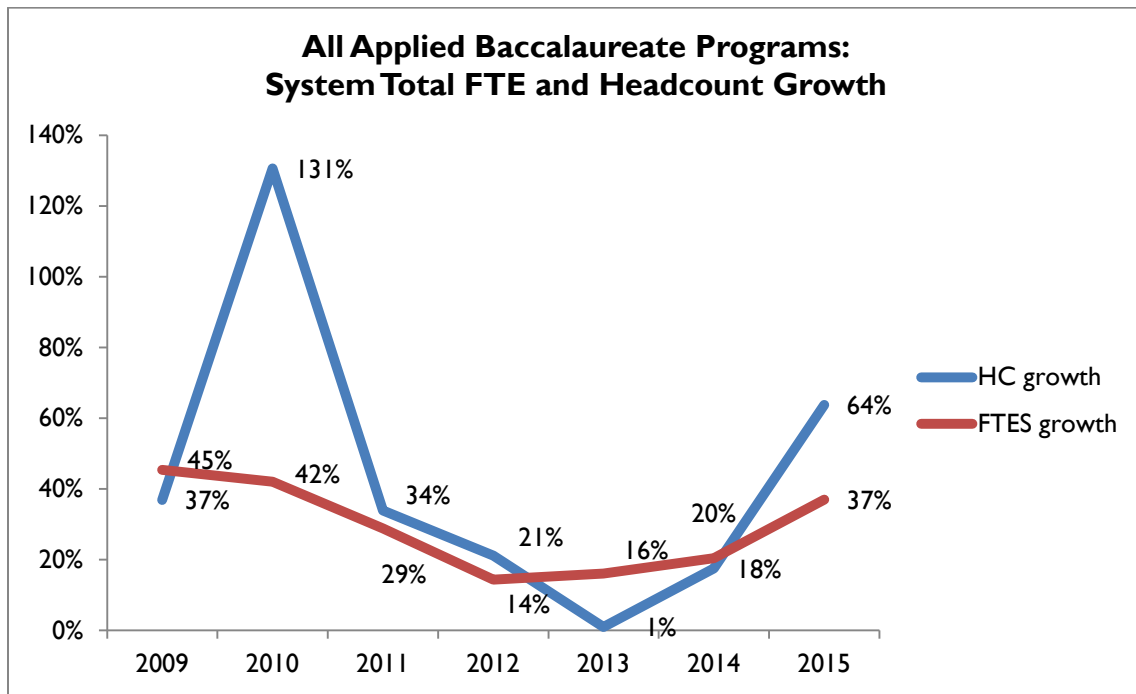
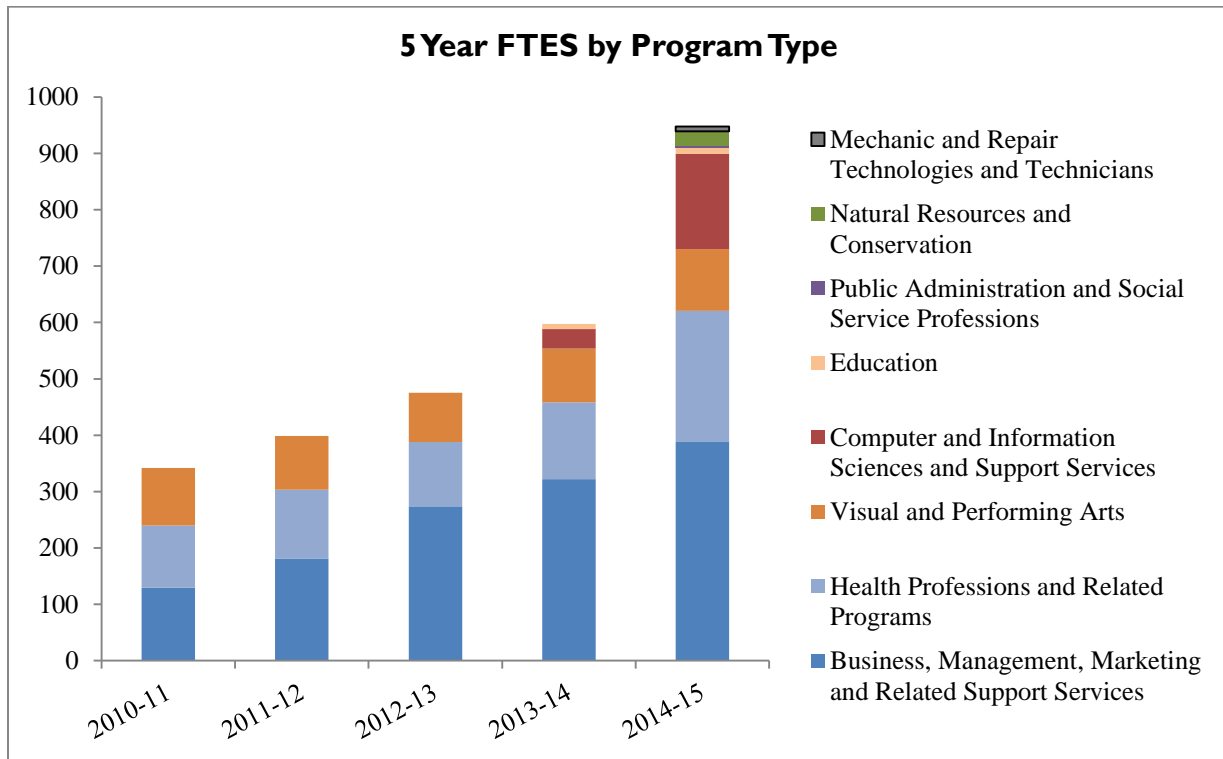


Table 3 and Figure 4 below shows the growth in program type over the past five years. In 2007-08, the programs were evenly distributed between healthcare, visual and performing arts, and business/management. By 2014-15, business/management FTES more than doubled, visual and performing arts stayed relatively 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 quadrupled in the following year as six of the 18 new programs coming on line were in cyber security, application development, and other IT related fields.

**Table 3**

Classification of Instructional Program (CIP)	2010-11	2011-12	2012-13	2013-14	2014-15
<b>Natural Resources and Conservation</b>	0	0	0	0	26
<b>Computer and Information Sciences and Support Services</b>	0	0	0	35	169
<b>Education</b>	0	0	0	9	10
<b>Public Administration and Social Service Professions</b>	0	0	0	0	4
<b>Mechanic and Repair Technologies and Technicians</b>	0	0	0	0	9
<b>Visual and Performing Arts</b>	102	96	87	95	110
<b>Health Professions and Related Programs</b>	110	122	114	136	231
<b>Business, Management, Marketing and Related Support Services</b>	129	182	274	322	389
<b>Total</b>	342	399	475	597	947

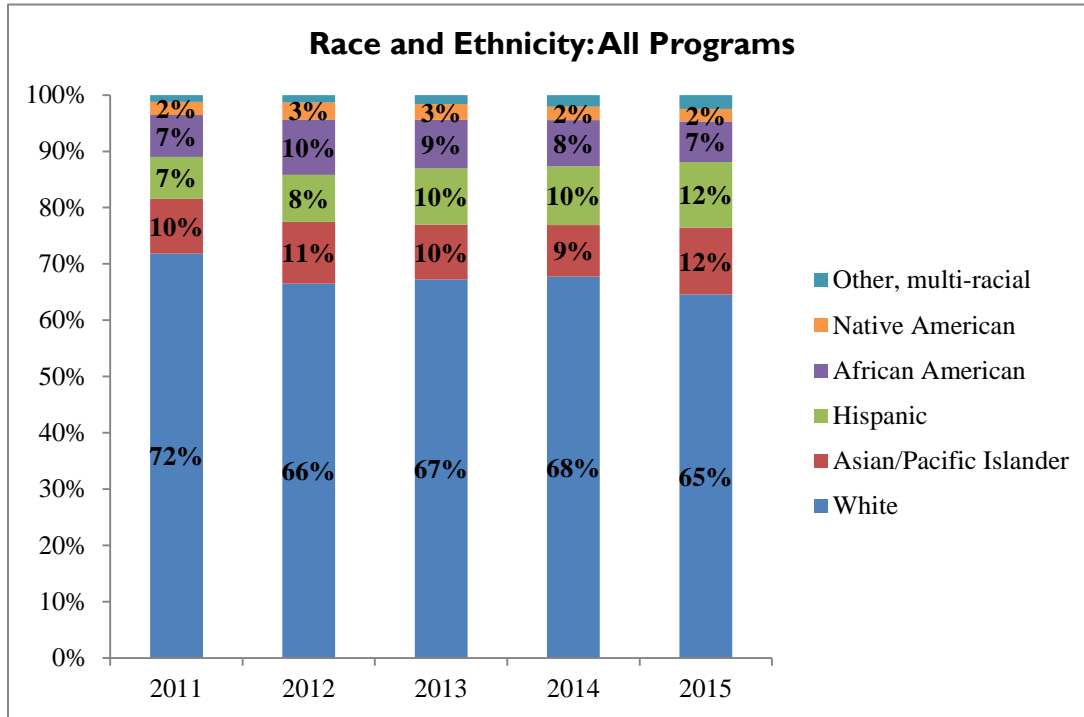
**Figure 4**



Student diversity in applied baccalaureate programs continues to increase each year.<sup>4</sup> In 2011, students identifying as “white” made up 72 percent of all enrolled students. This percentage dropped to 65 percent as of 2015. Students identifying as Native American has remained constant, while the percent of participation for students identifying as African-American has fluctuated up and back down to 7 percent in 2015, the same as in 2011. The percentage of students identifying as Hispanic has grown consistently over the past five years, up to 12 percent in 2015. The most recent year increase was due in large part to the new applied management program at Yakima Valley College and Cyber Security program at Columbia Basin College, both Hispanic-serving institutions. The largest single year increase in 2015 was for students identifying as Asian and Pacific Islander, from 9 percent up to 12 percent (Figure 5).

<sup>4</sup> Students are counted in up to two reported race/ethnicities for the entirety of the report.

Figure 5

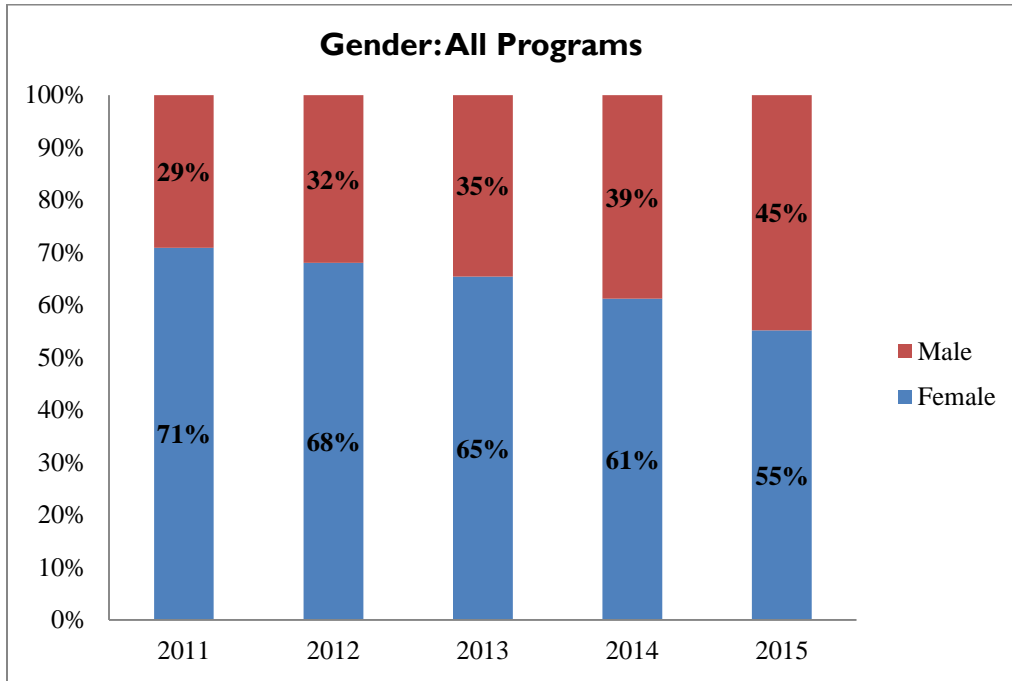


As noted in the introductory goals of applied baccalaureate programs, one of the service populations of the programs is place-bound females with family responsibilities. This is demonstrated by females making up more than three-fourths of the students in 2008 (Figure 6). However, as new programs have come on board, the diversity in gender has increased. The new Computer Science programs (which more than quadrupled in enrollment in 2015) are a primary driver of this shift with 81 percent male students in those programs. However, even at this level, females are more highly represented in applied baccalaureate programs as compared to workforce programs overall (approximately 57 percent male to 43 percent female).<sup>5</sup>

<sup>5</sup> Enrollment and Staffing Report. Fall 2014. SBCTC.

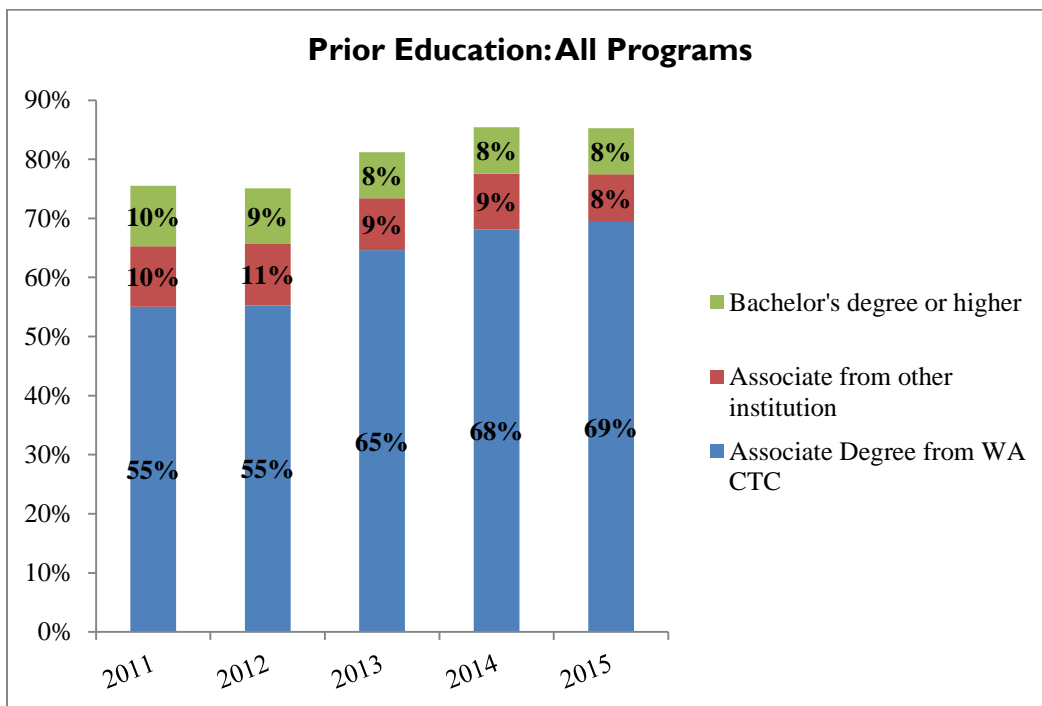


**Figure 6**



All students accepted into applied baccalaureate programs are required to have at least an associate degree. Figure 7 shows that the majority of applied baccalaureate students begin the program with an associate degree from a Washington CTC (Figure 7).

**Figure 7**



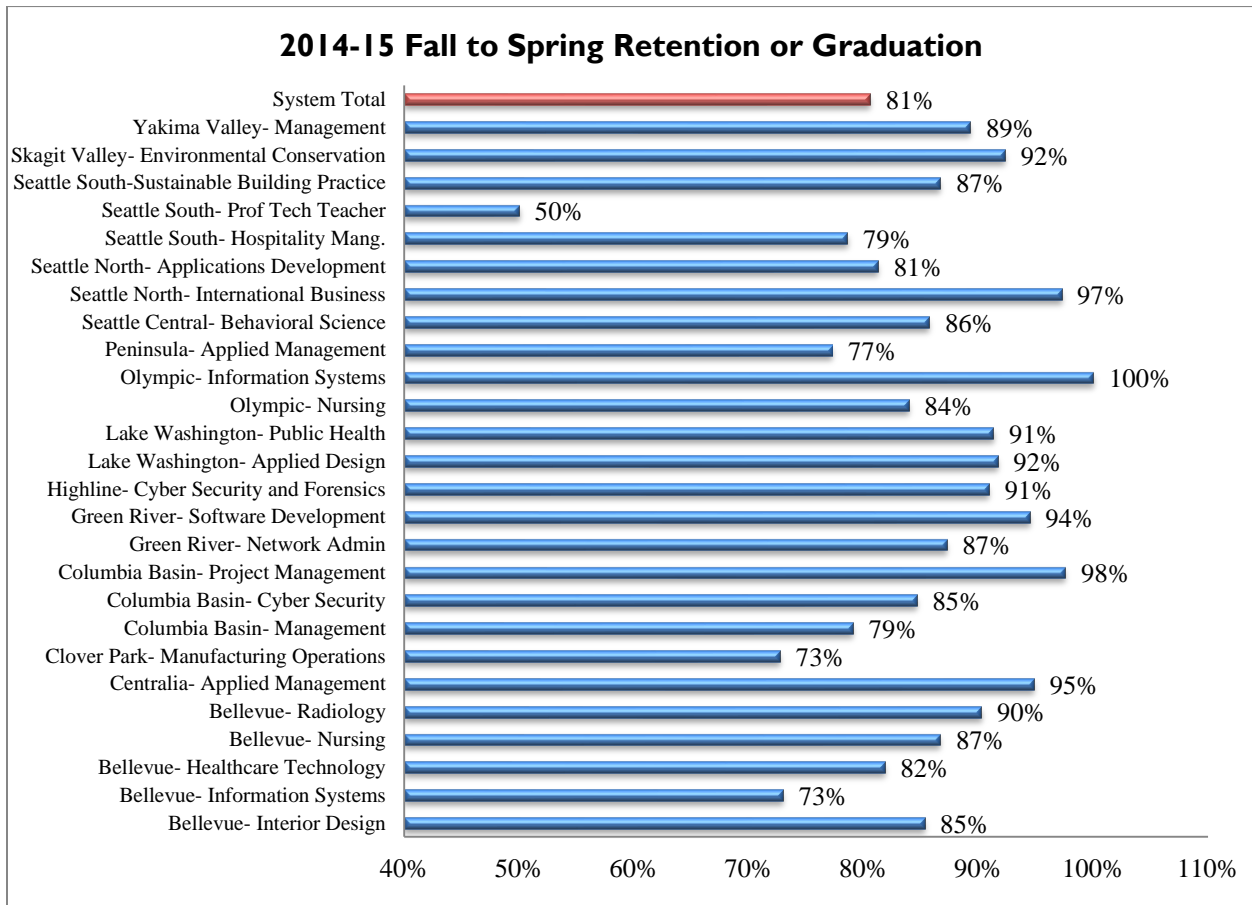
## Section II. Retention and completions

Colleges began graduating students with bachelors of applied science (AB) degrees in 2010, three years after some programs began. The number of graduates has grown substantially each year (Figure 8), due in part to high retention rates across the programs. Centralia’s Applied Management program which started in 2012, saw a 77 percent two-year completion rate for its first graduating class. As shown in Figure 9, colleges retained or graduated an average of 81 percent of their fall enrollment by the end of the 2014-15 academic year.

**Table 4. Graduates by Program**

College	Program	2010	2011	2012	2013	2014
Bellevue	Applied Arts in Inter. Design	0	39	38	37	34
	Radiology and Imaging Sciences	12	10	13	15	5
	Healthcare Technology and Management	0	0	0	0	2
Centralia	Applied Management	0	0	0	0	20
Columbia Basin	Management	0	23	17	34	61
	Project Management	0	0	0	0	5
Lake Washington	Applied Design	0	14	14	16	15
Olympic	Nursing	6	7	27	31	28
Peninsula	Applied Management	14	10	14	22	33
Seattle Central	Behavioral Science	0	16	16	22	25
Seattle South	Hospitality Management	20	22	21	21	18
<b>System Total</b>		<b>52</b>	<b>141</b>	<b>160</b>	<b>198</b>	<b>246</b>

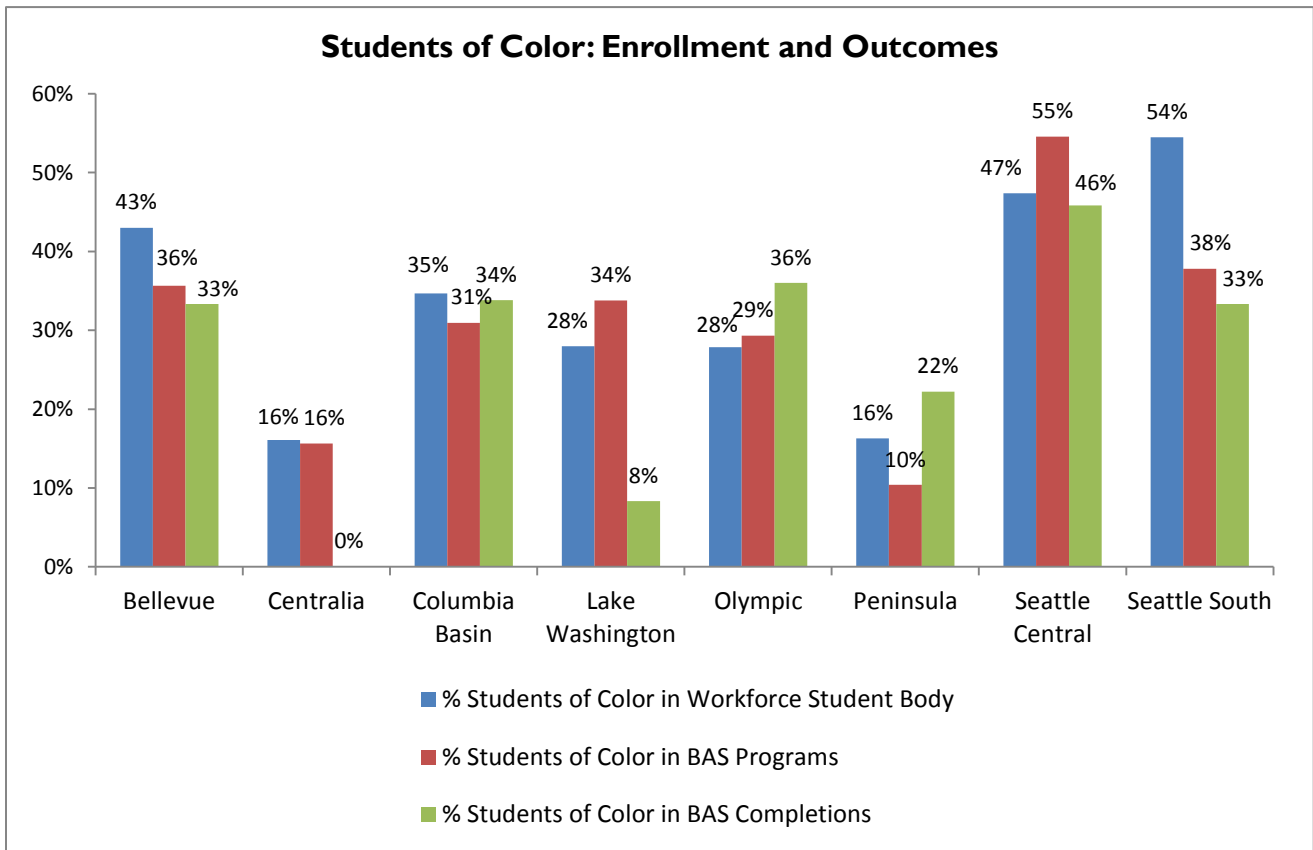
Figure 8



Equity of outcomes for students, particularly with the expansion of the workforce mission into applied baccalaureate 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 applied baccalaureate programs have on baccalaureate educational attainment in Washington. However, with the changing demographic landscape in the years ahead, attainment for historically under-represented groups is critical. Figure 9 provides a comparison of the composition of students of color in the workforce student body, the percentage participating in applied baccalaureate programs, and the percentage of applied baccalaureate graduates. This shows where there may be a gap between participation and completion.

Most of the colleges show equal or higher participation rates for students of color in applied baccalaureate programs as compared to the student body, with Bellevue, Columbia Basin, Peninsula, and Seattle South colleges as the exceptions. Some colleges have better parity than others between participation and completion of applied baccalaureate programs. Centralia College (who has a low percentage of students of color in workforce programs overall), did not have any students of color in their first graduating class in 2014. Lake Washington’s 2014 graduating class was just 8 percent of color, while more than one-third of their applied baccalaureate enrollment are students of color. Olympic College had a greater proportion of their students of color complete than their overall workforce and applied baccalaureate population, as did Peninsula College. For colleges where participation rates are not comparable, completion rates are substantially lower. This suggests a future area for focus and improvement.

**Figure 9**



## Section III.

### Post Program Employment Impacts

This part of the study aims to address the following questions:

#### Research questions

- I. Does having an applied baccalaureate degree result in higher earnings than the associate degree alone?
- II. Does the return to investment in earnings differ by field of study?
- III. Do the target populations for applied baccalaureate degrees (historically underserved students) benefit from applied baccalaureate degrees in the same way as their peers?

Please see companion report “15-3: Post Program Earnings Differences Between the by Associate in Applied Science and Applied Baccalaureate Degrees” for the full methodology and technical results of the analysis. The highlights of the methodology and findings are outlined below.

#### Data

An initial comparison group was compiled for each type of applied baccalaureate degree program, which was comprised of students who earned the same type of associate degree as their applied baccalaureate counterparts, but who had not gone on to complete the bachelor’s program (see Appendix D for degree program detail). The list of graduates were matched to Washington State employment records for employment within 3 quarters following graduation. The final sample for the analysis consisted of 281 applied baccalaureate graduates (an 84 percent employment match rate) and 1,771 associate degree graduates (a 70 percent employment match rate).

Table 5 below summarizes the findings for earnings differences between the two matched groups of graduates, demonstrating the impact of the baccalaureate degree program on earnings by program. The average difference in earnings for students with a baccalaureate degree and their associate degree counterparts controlling for student characteristics ranged from \$3,682 in Columbia Basin’s management program to \$26,787 in Bellevue’s radiology program. In all but two programs the differences were statistically significant. For some programs, other student characteristics explained variation in the earnings differential above and beyond the baccalaureate degree. These are identified in the last column of Table 5. For example, in Bellevue’s radiology program and Lake Washington’s applied design programs, male baccalaureate graduates earn significantly more than female baccalaureate graduates, suggesting gender differences in the more STEM-related fields. Of a positive note, there were no significant differences in earnings for students of color. This suggests that the target populations for applied baccalaureate degrees are benefitting from this level of education in the same way as their peers.

**Table 5. Average Earnings for Associate and Baccalaureate Degree Graduates by Field of Study**

	Associate Degree Earnings	Baccalaureate Degree Earnings	Difference	Additional significant predictors
<b>Bellevue: Interior Design</b>	\$24,429	\$29,631	\$5,202	None
<b>Bellevue: Radiology</b>	\$49,326	\$76,113	\$26,787*	Gender
<b>Lake Washington: Applied Design</b>	\$29,964	\$40,239	\$10,275*	Parent, prior work experience, gender, and prior bachelor's degree
<b>Peninsula: Management</b>	\$20,448	\$29,171	\$8,723*	None
<b>Columbia Basin: Management</b>	\$29,503	\$33,185	\$3,682	None
<b>Olympic: Nursing</b>	\$45,621	\$58,296	\$12,675*	Parent
<b>Seattle Central: Behavioral Science</b>	\$23,968	\$30,886	\$6,918*	Prior work experience
<b>South Seattle: Hospitality</b>	\$20,909	\$31,930	\$11,021*	None

\* significant, p-value < 0.05