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SOCIAL & ECONOMIC SCIENCES RESEARCH CENTER
PUGET SOUND DIVISION
OLYMPIA, WASHINGTON

The Role of Transfer in the Attainment of Bachelor's Degrees at Washington Public Baccalaureate Institutions, Class of 2006

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INTRODUCTION

BACKGROUND

The paths students take to their baccalaureate degrees are as varied as the students themselves and the subjects they study. The majority of students who complete a baccalaureate degree do so through a combination of credits from different sources, rather than accumulating credits at a single institution.

The characteristics and enrollment patterns of the baccalaureate Class of 2001 were explored in a report published by the State Board for Community and Technical Colleges in June 2003.¹ This study focuses on a similar set of questions for a more recent baccalaureate class, the graduates of the Class of 2006. As in the prior report, the public two-year and four-year colleges in Washington pooled student data for the purposes of examining the patterns of enrollment at community and technical colleges and other colleges in attaining bachelor's degrees.

The study was directed by the Washington Higher Education Coordinating Board with input from a technical workgroup of research and admissions specialists at Washington's public colleges and universities.² Data from independent colleges in Washington was collected but could not be used because it did not include information on all graduates in the Class of 2006.

RESEARCH QUESTIONS

Specifically, the study sought answers to the following questions:

- What was the make-up of graduates at main campuses, branch campuses, and centers?
- How many baccalaureate graduates entered four-year colleges directly as freshmen? How many transferred from a Community or Technical College (CTC)? How many came through other paths?
- How many of the graduates who came through the CTC system took pre-college math or English courses?
- Among students who transferred from a CTC, how many earned degrees, and what kind of degree did they earn?

All of the questions above were explored by gender, ethnicity, age, major, and institution.

¹ The prior study is available at http://www.sbctc.edu/college/d_transfer.aspx

² The Technical Workgroup represented all public baccalaureate institutions, the community and technical colleges and representatives of private four-year institutions. See Appendix 1 for membership.

STUDY POPULATION

This report is based on the records of 19,272 students who earned their first bachelor's degree as graduates of the Class of 2006. The study population includes all students who earned a BA degree from one of the six public baccalaureate institutions for whom transcript, demographic, and degree attainment data were available.

The study excludes:

- Any student asking that their individual institutional records not be used for research purposes, and
- Students whose records were incomplete

DATA SOURCES

This project brought together data from two sources:

- Public Centralized Higher Education Enrollment System (PCHEES) student files maintained by the Office of Financial Management (OFM) with information on the graduating Class of 2006
- State Board for Community and Technical College (SBCTC) data warehouse files for the graduates identified by PCHEES

PCHEES

PCHEES data is maintained for the Washington Public Baccalaureate institutions by the Office of Financial Management and is currently in the process of expanding its content. Data available for this study included:

- **Degree Attainment:** Type of degree, discipline title, granting university, major
- **Student Demographics:** College, student name, gender, race/ethnicity, birth date, immigration status
- **Transcript Course Data:** Institution/location, course identifier, course title, course number, credit hours attempted, year and term, distance learning flag, CIP, state funded, fee status
- **Transcript Summary Data:** Class standing, total credits transferred in, total credits from all dual credit sources combined (Tech Prep, Advanced Placement, Running Start, College in the High School)

SBCTC Data Warehouse

SBCTC matched graduate records against their data warehouse to identify graduates who had completed credits in Washington's public two-year college system. Data from SBCTC included:

- **Degree Attainment:** Type of degree, college granting the degree, CIP, date awarded
- **Student Enrollment Summary:** College, first quarter enrolled, last quarter enrolled, cumulative GPA
- **Course Enrollments:** College-level credits earned at Washington CTCs and types of pre-college credits taken at Washington CTCs
- **Dual Credit Enrollments:** Institution/location accepting the credit, activity generating the credit (Tech Prep, Alternative High School, Running Start, College in the High School)

Missing Data

Because PCHEES was still in the process of expansion, the data provided by this study did not contain all the data elements desired.³ Some of the data about four-year colleges that was not in the final dataset included:

- GPA at the baccalaureate institution
- Credits earned per class (only credits attempted were provided)
- Transferred credits by source
- Total credits earned from all sources
- Credits earned by level (upper and lower division)
- Pre-college math and English courses completed
- Credits earned through each of the different types of dual credit programs (only aggregate data was available from some colleges) and the timing of those credits
- Credits earned and transferred in from other four-year colleges in Washington State

KEY STUDY DEFINITIONS

Because the data came from a wide variety of institutions, SESRC met with a technical workgroup to share details about how variables were defined and initial data findings. The analysis applied many of the definitions used in SBCTC's study of the Class of 2001.

Campus Type

Data was not available on the specific location that granted the baccalaureate degree. For this study, graduates were assigned to a university, branch campus, or center based on where the majority of credits were taken. The participating colleges and universities were grouped into four categories: research universities, regional comprehensive universities, the branch campuses

³ For more detail, see Appendix 5.

of UW and WSU, and centers.⁴ See Chapter 1 for additional detail about the students enrolled at each.

Type of Student/Transfer Status

All graduates were classified as being a “direct entry” student, a “CTC transfer”, or an “other transfer” based on the credits and credentials they brought with them when they first entered a public baccalaureate institution. Methods for classifying students and differences between the Class of 2001 and Class of 2006 studies are described more completely in Chapter 2 and in Appendix 4.

Ethnicity

Because ethnicity data was not coded consistently across all institutions, ethnicity results are presented within each ethnicity category. Some colleges selected only one race/ethnic group per student, and one coded all “unknown” race as “other”. Because of this lack of consistency, inferences of the racial composition of students were not possible. For example, while it was not possible to report the percent of graduates from research universities who were Asian American, African American, etc., it was possible to talk about the percent of Asian Americans who graduated from the main campus of a research university as opposed to one of the other institutions.

Majors

To simplify analysis, student majors were grouped into one of six categories. In cases where students earned degrees in multiple disciplines, the primary “major” was identified from a prioritized ranking. Since not all students training to be elementary and secondary school teachers are necessarily education majors, transcript data was used to identify individuals who had enrolled in the “field internship” or student teaching components that were the culminating elements of teacher certification programs. Those students were recoded as having majored in education.⁵

REPORT STRUCTURE

This report follows the research questions set out above. The first chapter provides details about the characteristics of students who graduated from each type of campus. The second chapter examines the characteristics of graduates by transfer status (direct entry or transfer). Chapter three explores pre-college course enrollments among transfers from the Community and Technical College (CTC) system. The final chapter focuses specifically on these CTC transfers and the contribution of the CTCs to baccalaureate degree attainment.

⁴ Four independent colleges of Washington submitted data for the study, but their files only contained transfer students, not all students as needed for analysis. They are not included in the study.

⁵ For a list of the courses used to identify Education majors and a list of how all CIP codes were categorized, please see Appendix 2.

CHAPTER ONE: CHARACTERISTICS OF GRADUATES BY CAMPUS TYPE

The first research question asked about the composition of graduates by type of institution. For the purposes of this analysis, all institutions were grouped into four categories: research universities, branch campuses, regional comprehensive universities, and centers. The research universities are the University of Washington in Seattle and Washington State University in Pullman. Branch campuses include Tacoma and Bothell for the University of Washington and Vancouver, Tri Cities, and Spokane for Washington State University. The four remaining public baccalaureate institutions in Washington comprise the regional comprehensive universities: Eastern, Western, and Central Washington Universities and the Evergreen State College. The regional centers and distance degree programs were grouped together as “centers” for this study. (See Appendix 3 for a list of all centers and their affiliated home universities.)

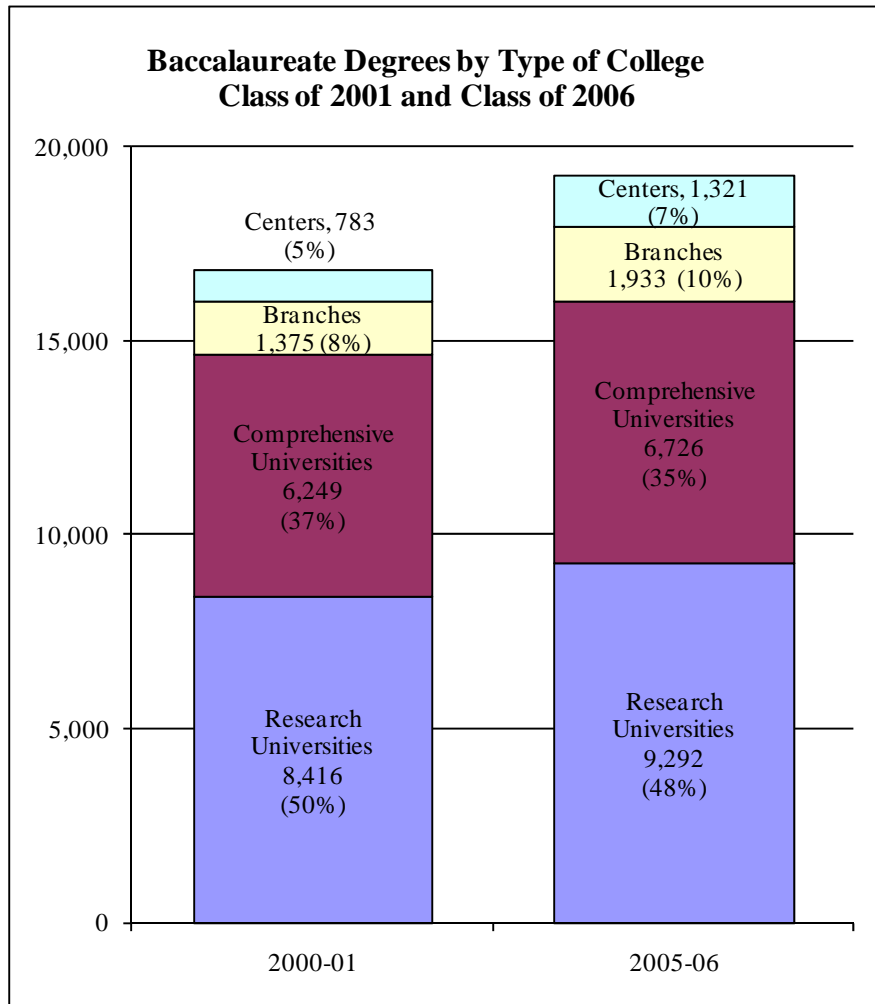
Figure 1: Categorization of College Campuses

	Research Universities	Comprehensive Regional Universities	Branch Campuses	Centers⁶
University of Washington	Seattle, Eve. Degree Program		Tacoma, Bothell	
Washington State University	Pullman		Spokane, Tri Cities, Vancouver	Distance and Other Sites
Central Washington University		Ellensburg		Other Sites
Eastern Washington University		Cheney		Other Sites
The Evergreen State College		Olympia		Other Sites
Western Washington University		Bellingham		Other Sites

⁶ Centers included programs offered by public baccalaureate institutions at various off-site locations and included WSU distance learning enrollments. See Appendix 3 for a list of all centers.

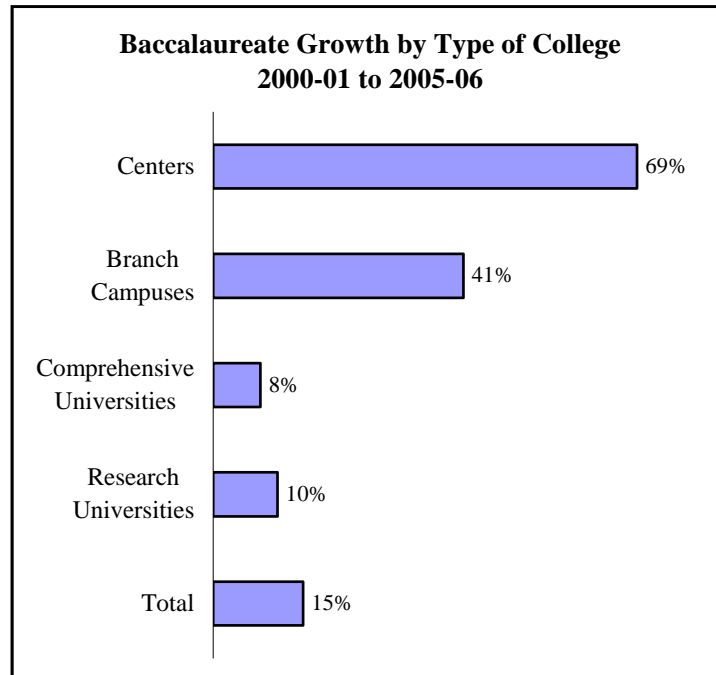
The number of first time bachelor's degrees increased from 16,823 in 2001 to 19,272 in 2006, an increase of 15 percent. Almost half (48%) of students graduated from the main campus of a research university, and just over a third (35%) of the students graduated from a regional comprehensive university. Both of these shares were down from the prior study. The share of students graduating from a branch campus of a research university (10%) or from a center or distance learning program (7%) both increased over the five year period. (See Figure 2.)

Figure 2



Statewide, the number of first time bachelor's degrees increased by 15 percent between 2001 and 2006. While all types of universities saw growth, the highest rates of growth came at the centers (69%) and branch campuses (41%). As of 2006, centers and branch campuses only provided junior and senior level courses. With branch campuses admitting first year students starting in the fall of 2006, this sector is expected to continue growing at a high rate. (See Figure 3.)

Figure 3

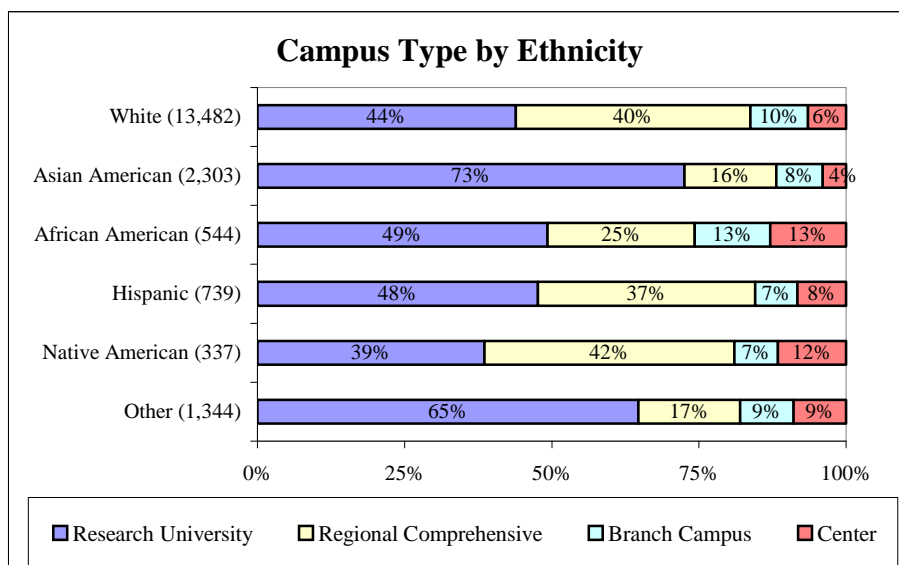


CHARACTERISTICS OF STUDENTS BY CAMPUS TYPE

Campus Type by Ethnicity

The type of college where the degree was earned varied by the graduate's ethnicity. Asian American students were much more likely to graduate from the main campus of a research university (73%) and much less likely to graduate from a regional comprehensive university than other ethnic groups. White and Native American students were more likely than other ethnic groups to graduate from a regional comprehensive university. Native Americans were the only ethnic group to have a higher proportion of graduates from the regional comprehensive universities (42%) than from the research universities (39%). African American students tended to earn degrees at branch campuses and centers more often than other ethnic groups. Native American students also had higher than average degree attainment rates from centers. (See Figure 4.) As stated above, because of inconsistencies in reporting student race and ethnicity across institutions, it was not possible to report the ethnic distribution of students at each campus type.

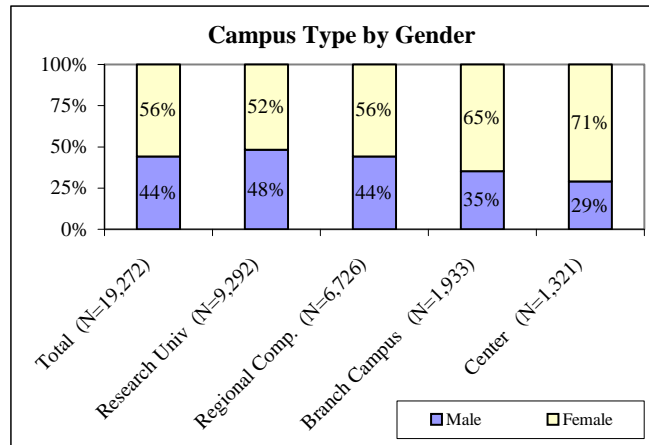
Figure 4



Campus Type by Gender

Statewide, the majority of graduates of the Class of 2006 were female (56%). While females constituted the majority of graduates for each college type, they were much more likely than males to earn degrees at the branch campuses and centers. (See Figure 5.)

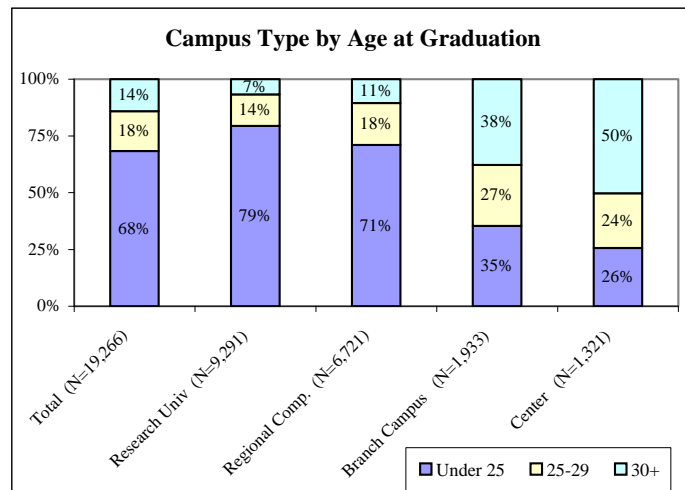
Figure 5



Campus Type by Age at Graduation

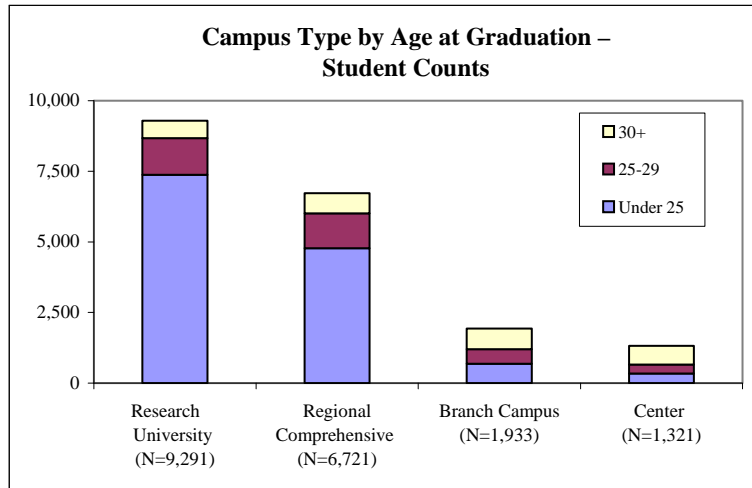
In terms of age, two-thirds of graduates (68%) were under 25 years old at the time of graduation. Graduates from research universities and regional comprehensive universities were most likely to be under 25 years (79% of the research university graduates and 71% of the regional comprehensive university graduates). In contrast, a majority of graduates from branch campuses and centers were of non-traditional ages. Only about a third of the branch campus graduates (35%) and a quarter of the center graduates (26%) were under 25 years. (See Figure 6.) It is not surprising that the branch campuses and centers attracted older students who may not have had the same flexibility to travel to the primary campus to attend classes.

Figure 6



The prior figure masked the relative size of the main campuses to the branch campuses and centers. Expressed as student counts in Figure 7, it is clear that most graduates were under 25 at the time of graduation.

Figure 7



Campus Type by Major

Majors were grouped into seven categories for analysis.⁷ The largest category was arts & letters, with 27 percent of degrees in this field. One-fifth (20%) of graduates earned a degree in social sciences or psychology, 17 percent earned a degree in business, and a similar share (17%) had a STEM-related degree (science, technology, engineering, and mathematics). Smaller numbers earned a degree in education (5%) or health (4%). Approximately one in ten majors did not fit the above categories and were grouped as “other”. These include family & consumer science, law, and agriculture. (See Figure 8 and Figure 9.)

Almost half of research university graduates earned degrees in social sciences/psychology (25%), or STEM-related majors (24%). On the other hand, regional comprehensive universities had above average numbers of arts & letters majors (33% of all graduates) and education majors (9%). It appears that branch campuses had a relative specialization in health-related majors. However, this was largely due to the WSU-Spokane campus where 93 percent of graduates were in health-related fields and strong health programs at UW-Bothell and UW-Tacoma. Centers produced the proportionately largest share of business majors (31%) and educators (15%). Centers also had the largest proportion of graduates majoring in other disciplines.⁸

⁷ See Appendix 2 for more details on how majors were handled in this study.

⁸ These majors included human development/family studies (N=28), child development (N=73), and legal studies (N=179) out of an overall count of 289 “other majors”.

Figure 8

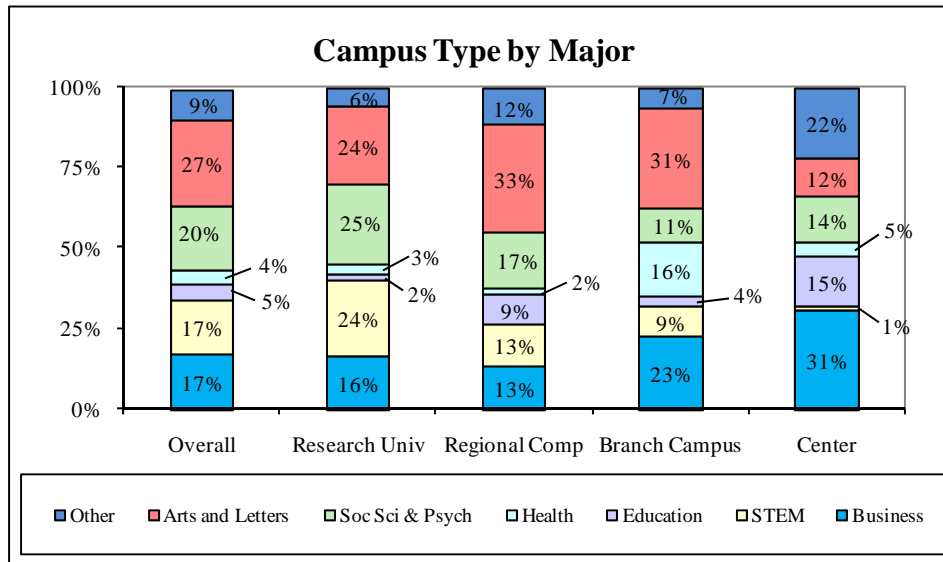


Figure 9: Major by Campus Type

	Research Univ (N=9,292)	Regional Comp (N=6,726)	Branch Campus (N=1,933)	Center (N=1,321)	Overall (N=19,272)
Arts and Letters (N=5,232)	43%	42%	11%	3%	100%
Business (N=3,260)	46%	27%	14%	13%	100%
Education (N=1,051)	18%	58%	7%	19%	100%
STEM (N=3,301)	68%	26%	5%	0%	100%
Health (N=774)	36%	17%	40%	9%	100%
Soc Sci & Psych (N=3,877)	60%	29%	5%	5%	100%
Other⁹ (N=1,777)	31%	45%	8%	16%	100%
Total (N=19,272)	48%	35%	10%	7%	100%

⁹ “Other” majors include consumer science, law, and agriculture.

CAMPUS TYPE -- SUMMARY

- The research universities granted the most degrees (48% of all degrees in 2006) followed by regional comprehensive universities (35%). Branch campuses (10%) and centers (7%) enrolled and graduated much smaller numbers of students.
- The overall number of degrees was up by 15 percent since 2001 with the largest percentage increases at centers (69%) and branch campuses (41%).
- Asian Americans tended to graduate from research universities. A higher proportion of Native Americans graduated from the regional comprehensive universities than the research universities.
- A higher proportion of African Americans and Native Americans received their degrees from centers than other ethnic groups.
- More females than males earned degrees from branch campuses and centers.
- The vast majority of branch campus and center graduates were at least 25 years old.
- Centers had a higher proportion of business majors than other campus types.
- Research universities had a higher proportion of social science and STEM-related majors than other campus types.
- Regional comprehensive universities and centers had a higher proportion of education majors than other campus types.
- Branch campuses had a higher proportion of health-related majors than other campus types.
- Regional comprehensive universities had a higher proportion of arts and letters majors than other campus types.

CHAPTER TWO: TRANSFER STATUS

The primary purpose of the prior study was to document the role Community and Technical Colleges (CTCs) played in baccalaureate degree attainment. This section and the next take up many of the questions addressed in the study on the Class of 2001.¹⁰ This chapter looks at CTC transfers as they compare to direct entry and other transfer students.

Students were first classified as direct entry or transfer. Direct entry students included those who entered without a degree and with less than 40 credits transferred from another institution. Transfer students took 40 or more quarter credits outside the baccalaureate institution.¹¹

“Transfer” students were further subdivided into “CTC transfers” and “other transfers.” CTC transfers included students who had earned a degree from a CTC or earned half or more of their transferred credits at a CTC in Washington.

“Other transfers” came to the baccalaureate institution with at least 40 credits, the majority of which came from institutions outside of Washington’s public higher education system. This category presumably included a small number of students who had earned associate’s degrees from private or out-of-state public institutions.

Direct entry students may have entered with some outside credits, but they were classified as direct entry for this analysis if the total identified external credits were fewer than 40.

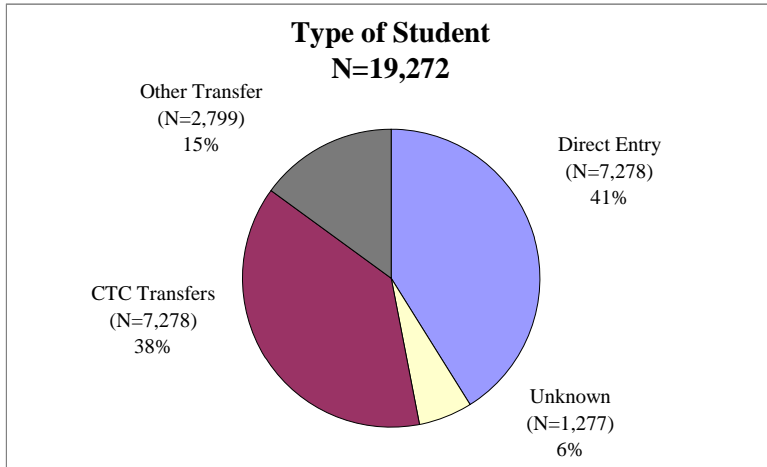
Some students were difficult to classify because they had fewer identified credits attempted and/or completed than would be necessary to graduate after matching SBCTC and public baccalaureate records. In Figure 10 below, students with incomplete records who were missing more than 40 of the 180 quarter credits necessary to graduate are identified as “Unknown”, however, these students are classified as “Direct Entry” for the remainder of the report.

More than half (53%) of the graduates of public baccalaureate institutions were categorized as transfers. Forty-one percent of graduates were direct entry students, compared to 45 percent in 2001. Six percent of graduates could not be identified with absolute certainty. CTC transfers comprised at least 38 percent of all graduates and at least 15 percent were other transfers.

¹⁰ Because of data issues, there were differences in how some students were defined between the Class of 2001 and 2006 studies. Please see Appendices 4 and 5 for more detail.

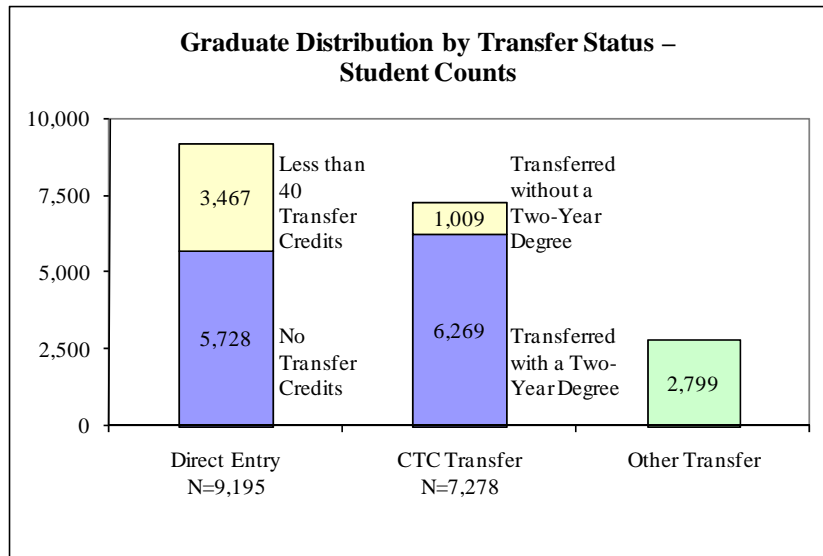
¹¹ Transfer credits did not include credits taken at another Washington public four-year college. Those credits were not identified in the data for this study.

Figure 10



Among graduates of the Class of 2006, at least 70 percent had attended two or more colleges, up slightly from 66 percent in 2001. Almost 40 percent of direct entry students had some transfer credits. Just over half (51%) of graduates of the Class of 2006 took at least one course from a CTC, down slightly from 55 percent in 2001.

Figure 11

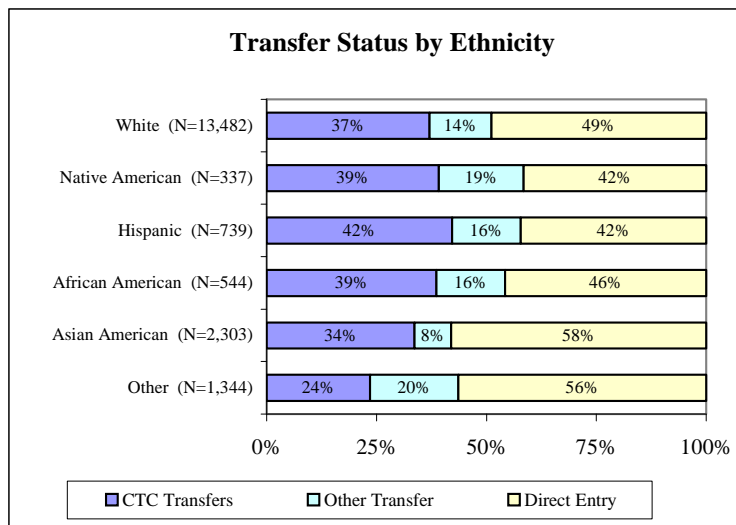


CHARACTERISTICS OF STUDENTS BY TRANSFER STATUS

Transfer Status by Ethnicity

Similar to the patterns of the Class of 2001, the traditionally underserved ethnic groups (African American, Hispanic, and Native American) were more likely to enter the four-year system via transfer than as a direct entry. Native American (58%), Hispanic (54%), and African American (54%) graduates of the Class of 2006 were much more likely to transfer with 40 or more credits than Asian American graduates (42%). Half of white graduates transferred in and half were direct entry. (See Figure 12.)

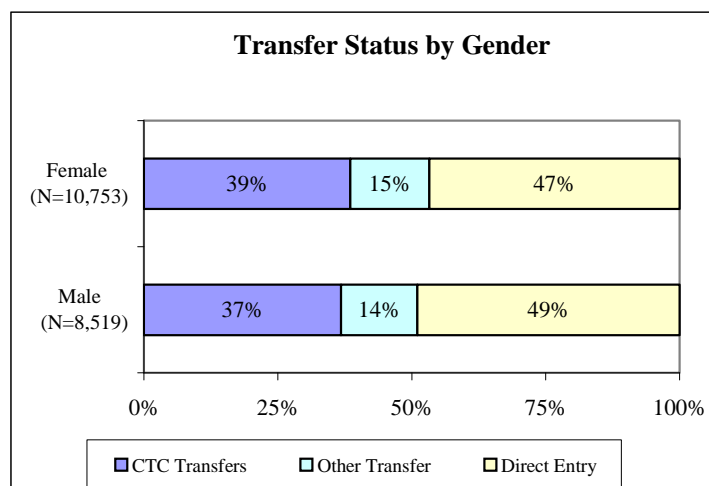
Figure 12



Transfer Status by Gender

Overall, the difference between male and female graduates was minimal. Slightly more female graduates than male graduates were transfer students (53% versus 51%). (See Figure 13.)

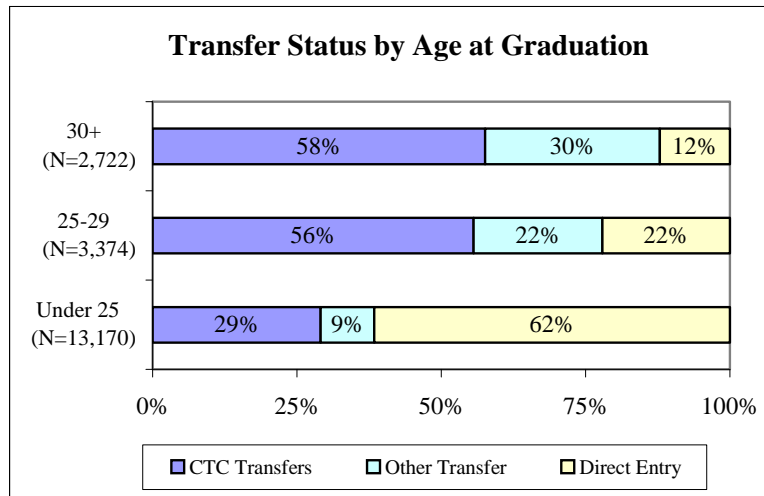
Figure 13



Transfer Status by Age at Graduation

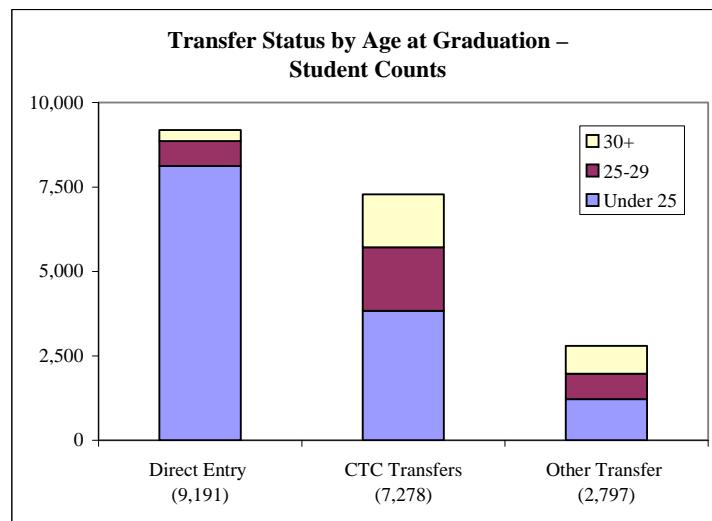
The percentage of students entering as direct entry decreased and the percentage of transfer students increased with age. Among the students 25 years and younger, almost two-thirds were direct entry (62%). For 25-29 year olds, the share of direct entry was just 22 percent, and only 12 percent of graduates were over the age of 30 at the time of graduation. (See Figure 14.)

Figure 14



Looking at the overall counts of students reveals the extent to which younger students still predominated among baccalaureate graduates in 2006. Direct entry students were overwhelmingly under 25 years old (88%). Only 4 percent were 30 years or older. Transfer opportunities clearly contributed to the overall age diversity of the graduating class. (See Figure 15.)

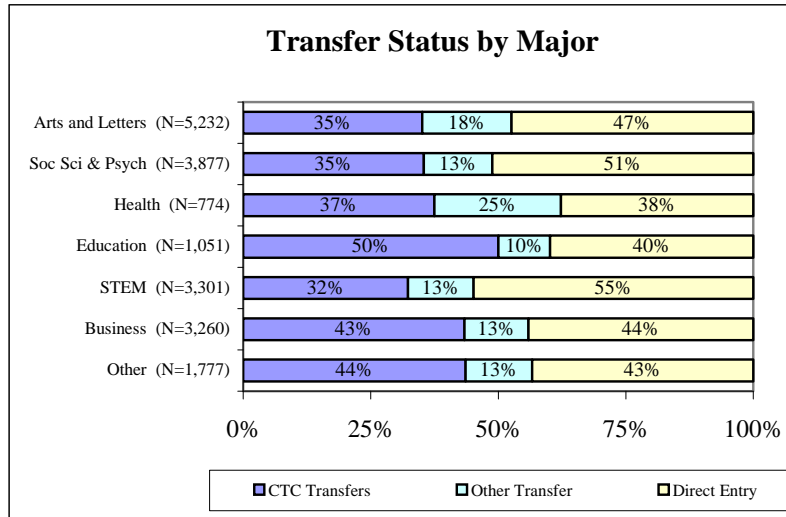
Figure 15



Transfer Status by Major

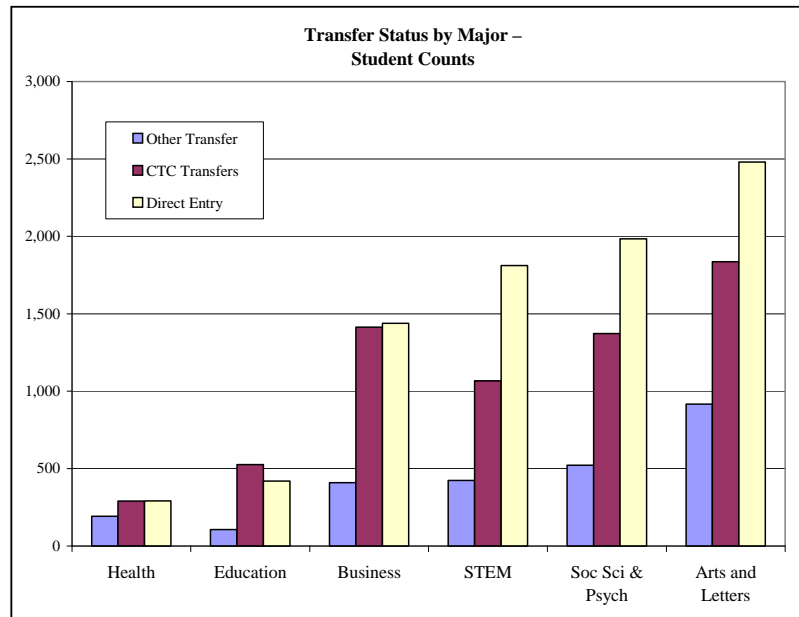
CTC transfers were well represented in all majors with percentages of total majors from CTC transfers ranging from 32% in science, technology, engineering, and mathematics (STEM) to 50% in education. Health-related majors had a high percentage of other (non-CTC) transfers. (See Figure 16.)

Figure 16



When presented as overall counts, the relative size of each major category was more evident. Transfer students comprised a greater share of health, education, and business majors, and they contributed significant shares of graduates in the other major categories.

Figure 17

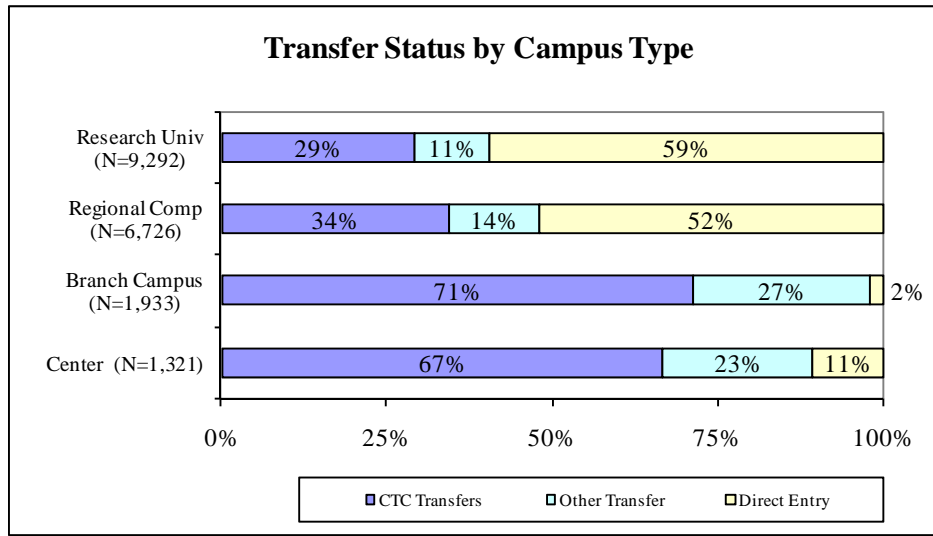


Transfer Status by Campus Type

CTC transfers represented a larger share of students at the regional comprehensive universities than at the research universities. Among the branch campuses and centers, at least 71 percent of the students at branch campuses and 67 percent at centers were CTC transfers.

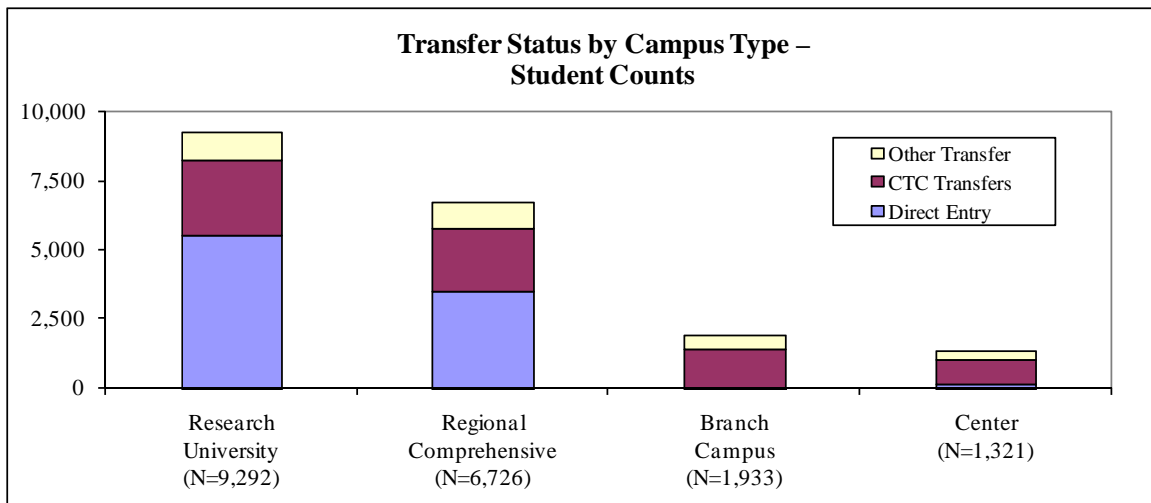
Even though at the time the students in this study were enrolled, neither branch campuses nor centers admitted freshmen, some students were identified as direct entry graduates. These students likely took their lower-division coursework at the main campus and then moved to the branch campus or center for their last two years.¹² (See Figure 18.) Because of the different data available and methods used in this study, results are not directly comparable to the Class of 2001 study.

Figure 18



Shown as counts of graduates by transfer status, Figure 19 provides another view of the role of the pathway each graduate pursued on their way to a four-year degree.

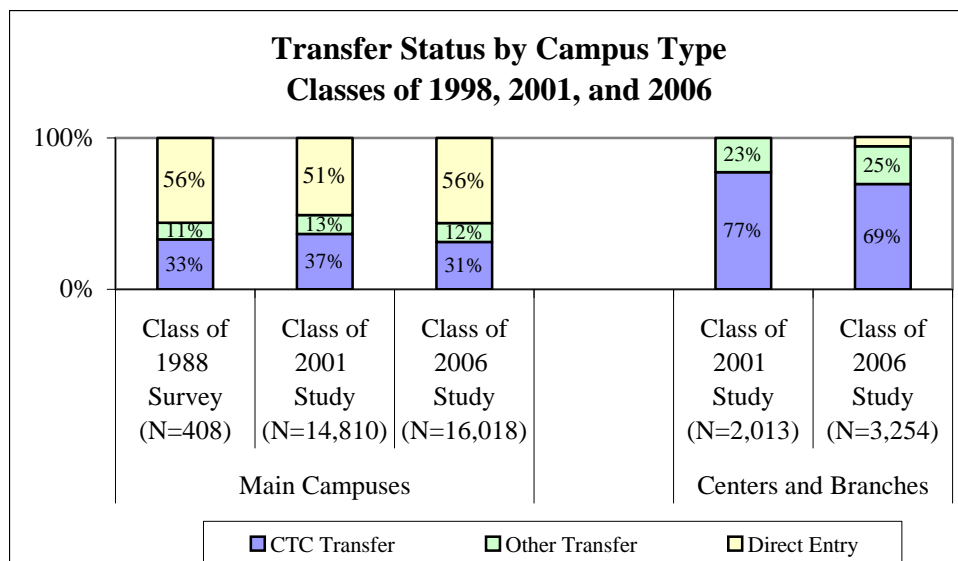
Figure 19



¹² For a more complete discussion of this and other differences between this study and the prior study, please see Appendix 4.

The transfer status of graduates by campus has remained relatively constant. Comparing results from a survey of graduates of the Class of 1998, results from the SBCTC study of the Class of 2001, and this most recent Class of 2006, there were generally consistent patterns.¹³ The percentage of graduates from the main campus who were direct entry was between 51 and 56 percent. CTC transfers were 31 to 37 percent of the graduating class. At centers and branches, CTC transfers comprised 69 to 77 percent of all graduates.

Figure 20



¹³ Because the Class of 1998 was conducted via survey, and there were slight variations in classifying student transfer status in 2001 and 2006, the variations between cohorts should be considered measurement error rather than indicative of a change in student behavior.

TRANSFER STATUS -- SUMMARY

- More than half (53%) of the Class of 2006 from public baccalaureate institutions was categorized as transfers; 47 percent were direct entry.
- Among graduates, at least 70 percent of graduates had attended two or more colleges, up from 66 percent in 2001. Almost 40 percent of direct entry students had some transfer credits.
- Similar to the patterns of the Class of 2001, the traditionally underserved ethnic groups (African American, Hispanic, and Native American) were more likely to enter the four-year system via transfer than as a direct entry.
- Overall, the difference between male and female graduates was minimal. Slightly more female graduates than male graduates were transfer students (53% versus 51%).
- Older students were much more likely to enter a university via transfer rather than as a direct entry student. Among the students 25 years and younger, almost two-thirds were direct entry (62%). Among older students, 22 percent of 25-29 year olds and just 12 percent of graduates over the age of 30 were direct entry.
- CTC transfers were well represented in all majors with percentages of total majors from CTC transfers ranging from 32 percent in STEM to 50 percent in education. Health-related majors had a high percentage of other (non-CTC) transfers.
- At least 71 percent of the students at branch campuses and 67 percent at centers were CTC transfers.
- The transfer status of graduates by campus has remained relatively constant over the past five years. At the main campuses, roughly half of each class was direct entry, and CTC transfers were about one-third of each graduating class. At centers and branches, CTC transfers comprised over two-thirds of all graduates.

CHAPTER THREE: PRE-COLLEGE ENROLLMENTS

There is increasing concern among policymakers about the large number of students who take pre-college math and English courses. Whether called remedial, pre-college, or developmental, these are courses that are taught below the college level and, as such, do not earn college credit for their completion.

Most pre-college courses are taken at Washington's Community and Technical Colleges (CTCs). A recent study by WSU-SESRC estimated that among recent high school graduates in 2004, approximately 90 percent of all pre-college math and English courses in Washington were taken at a CTC.

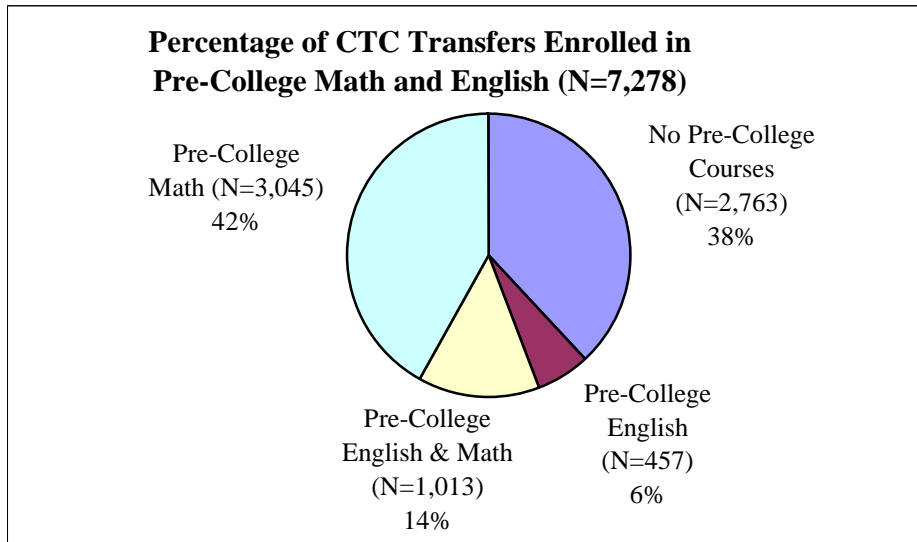
Numbers in this section focus exclusively on the 7,278 CTC transfer students. Pre-college math and English enrollment data was not available from the baccalaureate institutions.

Of the CTC transfer students, 62 percent started at a pre-college level and progressed to a baccalaureate degree. The majority took pre-college math (56%) while 20 percent took pre-college English. The rate of 62 percent was an increase from the Class of 2001 (56%).

With the majority of graduates coming through the CTC system with at least one pre-college level class, CTCs provide a critical pathway to the degree for students who might not otherwise be able to enroll in college.

Sixty-two percent of CTC transfers equates to at least 23 percent of all graduates starting with a pre-college course. The number is likely higher as it is not known how many other graduates took pre-college coursework at a four year university or at other colleges prior to transfer.

Figure 21

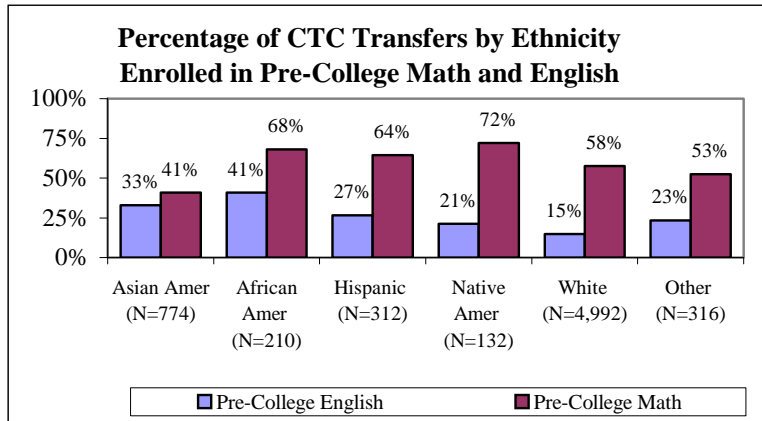


CHARACTERISTICS OF STUDENTS BY PRE-COLLEGE ENROLLMENTS¹⁴

Pre-College Enrollments by Ethnicity

Pre-college enrollments among CTC transfer students were high across all ethnic groups.¹⁵ Pre-college enrollments were particularly high in math among African American, Hispanic, and Native American CTC transfers. African Americans had the highest rate of pre-college English enrollments. (See Figure 22.)

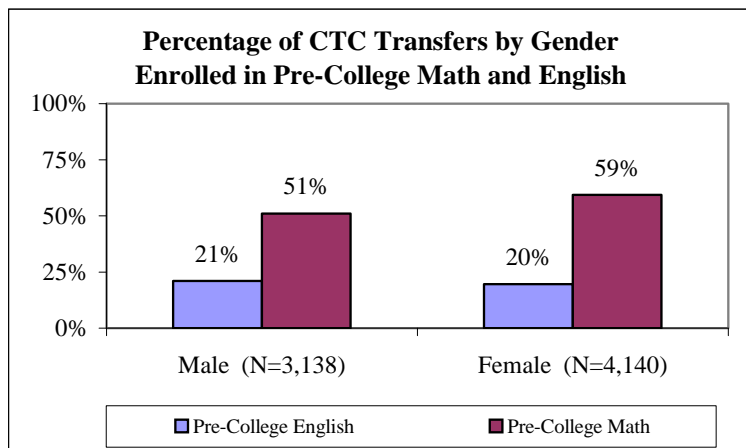
Figure 22



Pre-College Enrollments by Gender

In terms of gender, the difference in pre-college English enrollment between males and females was minimal (21% for males compared to 20% for females). In pre-college math, females enrolled at a higher rate than males (59% of females versus 51% of males).

Figure 23



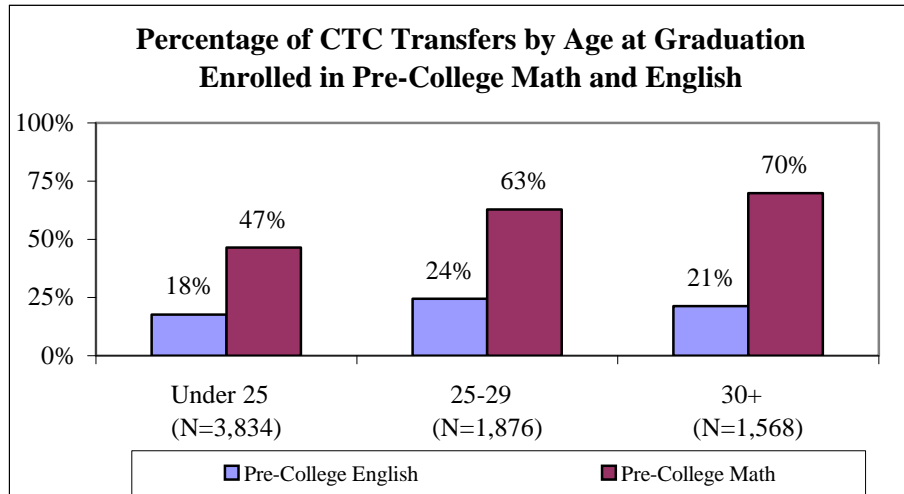
¹⁴ For all charts in this section, please keep in mind that 14% of CTC transfers took both pre-college math and English.

¹⁵ For additional information on pre-college enrollments of recent high school graduates by race/ethnicity, see http://www.sbctc.ctc.edu/college/education/resh_rpt_07_2_systemsummary_precollege.doc

Pre-College Enrollments by Age at Graduation

Overall, there was little variation by age in the percentage of students enrolled in pre-college English. For pre-college math, the percentage of students increased by age. Forty-seven percent of the students under 25 years enrolled in pre-college math compared to 70 percent of the students over 30 years of age. (See Figure 24.)

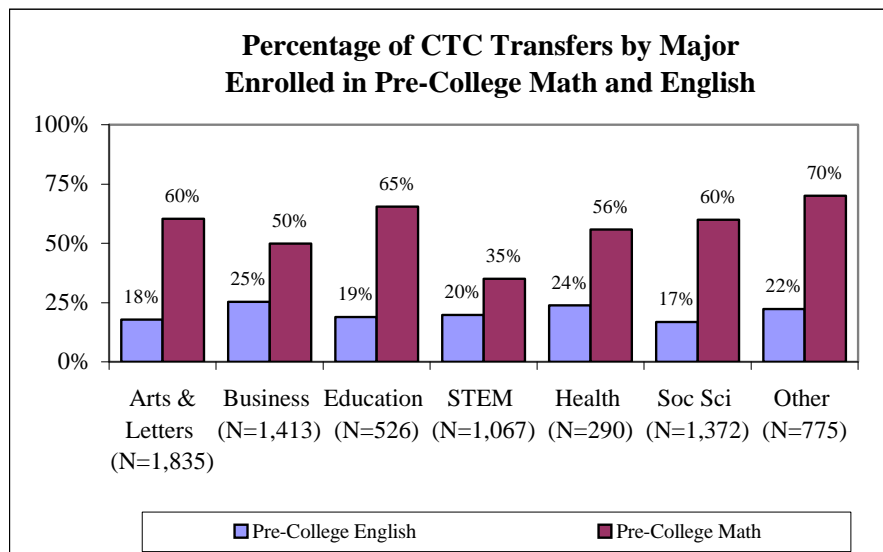
Figure 24



Pre-College Enrollments by Major

CTC transfers in all majors made their way through pre-college courses. These included graduates taking pre-college math and continuing into math-intensive majors, such as STEM (35%) and business (50%). Education and “other” majors had the highest percentage of students enrolled in pre-college courses (68% and 73%, respectively). This is related in part to the age distribution of graduates. Graduates who were 30 or older at the time of graduation were more likely to major in health and education and much less likely to major in STEM.

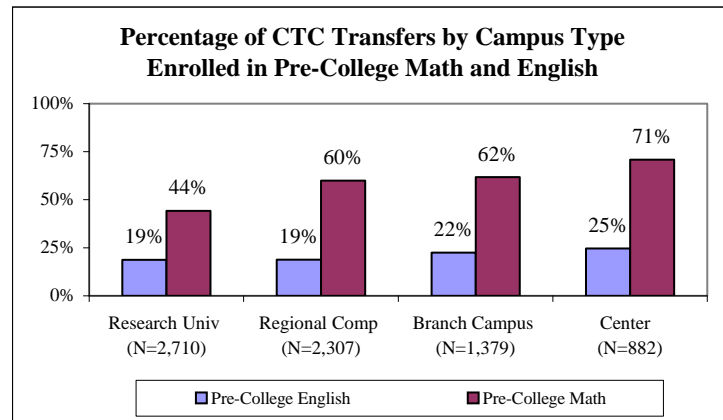
Figure 25



Pre-College Enrollments by Campus Type

Students at centers had the highest enrollment rates in pre-college English (25%) and pre-college math (71%), and research universities had the lowest of both (19% in pre-college English and 44% in pre-college math). There was little variation in pre-college English enrollment rates across campus type. Given the age distributions across campus types, the center and branch results are to be expected. (See Figure 26.)

Figure 26



PRE-COLLEGE ENROLLMENTS -- SUMMARY

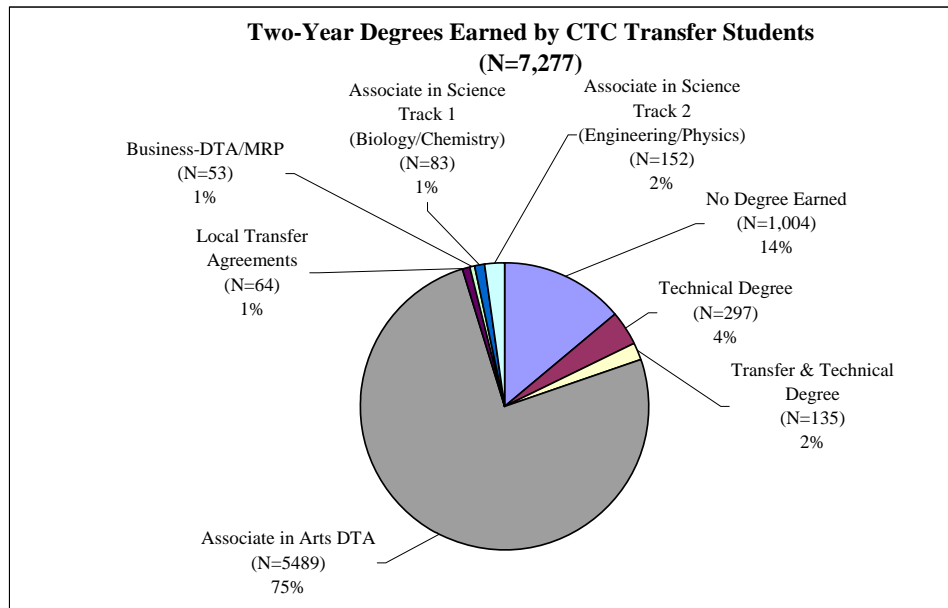
- Among CTC transfer students, 62 percent started at a pre-college level and progressed to college level courses and a baccalaureate degree. The majority took pre-college math (56%) while 20 percent took pre-college English. The rate of 62 percent was an increase from the Class of 2001 (56%).
- With the majority of graduates coming through the CTC system with at least one pre-college level class, CTCs provided a critical pathway to the degree for students who might not otherwise have been able to enroll in college.
- Sixty-two percent of CTC transfers equates to at least 23 percent of all graduates starting with a pre-college course.
- There was little variation by age in the percentage of students enrolled in pre-college English. For pre-college math, the percentage of students enrolled increased by age.
- Math enrollments were particularly high among African American, Hispanic, and Native American CTC transfers.
- Large numbers of CTC transfers in all majors started college at the pre-college math level, including majors that rely on strong math skills such as STEM (35%) and business (50%). Starting with pre-college math or English did not appear to prevent completion of any program.
- Students at centers had the highest enrollment rates in both pre-college English (25%) and pre-college math (71%), and research universities had the lowest of both (19 and 44%). There was little variation in pre-college English enrollment rates across campus type. Given the age distributions across campus types, the center and branch results are expected.

CHAPTER FOUR: TWO-YEAR DEGREES EARNED

Study sponsors wanted to know about the kinds of associate’s degrees earned by CTC transfers who completed a two-year degree before they transferred to a baccalaureate program.¹⁶ Data from SBCTC classified all degrees into seven categories. Overall, 86 percent of the 7,277 CTC transfers completed a degree, which was 12 points higher than the 74 percent reported for the Class of 2001.

By far, the most common degree was the Direct Transfer Agreement Associate in Arts Degree (DTA)¹⁷ that focused on meeting the common lower-division general education requirements and preparation for a major. Three-quarters of all graduates who were CTC transfers had completed this degree. In lieu of a transfer degree, 4 percent of CTC transfers completed a technical degree¹⁸ and 2 percent earned both a transfer and a technical degree. An additional 4 percent earned specialized Associate in Arts and Associate in Science degrees -- the Business Major Related Program (MRP) and the Associate of Science Transfer AS-T Track 1 and Track 2. The Business MRP was implemented in 2003 and continues to be the most popular of all MRPs. However, eleven additional MRPs were established between 2003 and 2006 and the number of participants in these and other programs added after 2006 continues to grow. In Figure 27, local transfer agreements refer to agreements between an individual CTC and an individual university for preparation for transfer to a specific major.

Figure 27



¹⁶ For more information about Washington State transfer and articulation policies, please see: <http://www.hecb.wa.gov/research/issues/transfer.asp>

¹⁷ The Direct Transfer Agreement Associate Degree (DTA) is variously referred to in this document as an “Associate in Arts DTA” or simply “the DTA degree”

¹⁸ Technical degrees are programs of at least 90 credits (2 years) designed to prepare students for work in a specific field. Technical degrees include courses focused on job preparation as well as courses in communication, math and human relations or social sciences. Two technical programs with a large number of graduates and thus many who eventually transfer are the associate degree nursing and mid-management programs.

CHARACTERISTICS OF STUDENTS BY TWO-YEAR DEGREES EARNED

Two-Year Degree by Ethnicity

The percentage of students transferring with a degree was particularly high for Hispanic CTC transfers (93%) compared to other ethnic groups.

Among specific types of degree, African American and Native American students were more likely than other groups to earn technical degrees. Asian American students were more likely than others to complete an Associate in Science Track 2 which aligns closely to engineering-related majors. (See Figure 28 and Figure 29.)

Figure 28

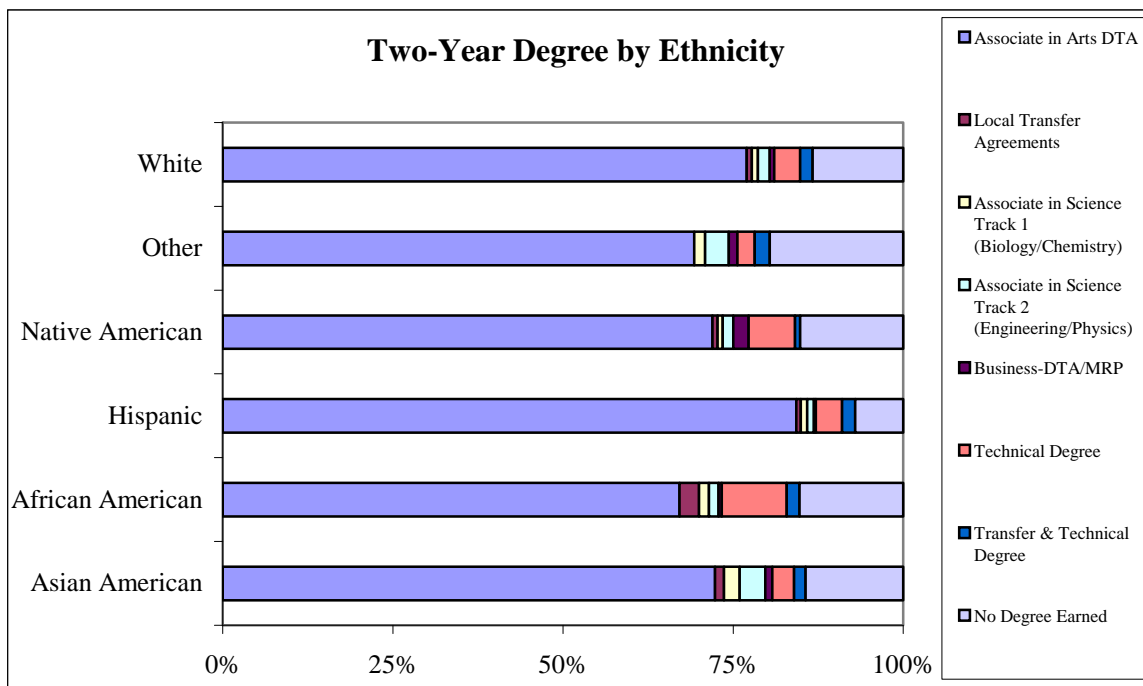


Figure 29: Two-Year Degree by Ethnicity – Detailed Table

	Associate in Arts DTA	Local Transfer Agreements	Associate in Science Track 1 (Biology/Chemistry)	Associate in Science Track 2 (Engineering/Physics)	Business-DTA/MRP	Technical Degree	Transfer & Technical Degree	No Degree Earned
Asian American (N=774)	72.4%	1.3%	2.3%	3.7%	1.0%	3.2%	1.7%	14.3%
African American (N=210)	67.1%	2.9%	1.4%	1.4%	0.5%	9.5%	1.9%	15.2%
Hispanic (N=312)	84.3%	0.6%	1.0%	1.0%	0.3%	3.8%	1.9%	7.1%
Native American (N=132)	72.0%	0.8%	0.8%	1.5%	2.3%	6.8%	0.8%	15.2%
Other (N=316)	69.3%	0.0%	1.6%	3.5%	1.3%	2.5%	2.2%	19.6%
White (N=4,991)	77.0%	0.7%	0.9%	1.7%	0.7%	3.8%	1.8%	13.3%

Two-Year Degree by Gender

Overall, 57 percent of CTC transfer graduates were female. Males and females tended to pursue different types of degrees prior to transfer.¹⁹ Females were much more likely to have completed a technical degree (67% of technical degree earners were female) and Associate in Arts DTA or local transfer agreement degrees (59% each). Males were much more likely to complete the Associate in Science Track 2 (engineering/physics) (83%) as well as the other specialized degrees. (See Figure 30 and Figure 31.)

Figure 30

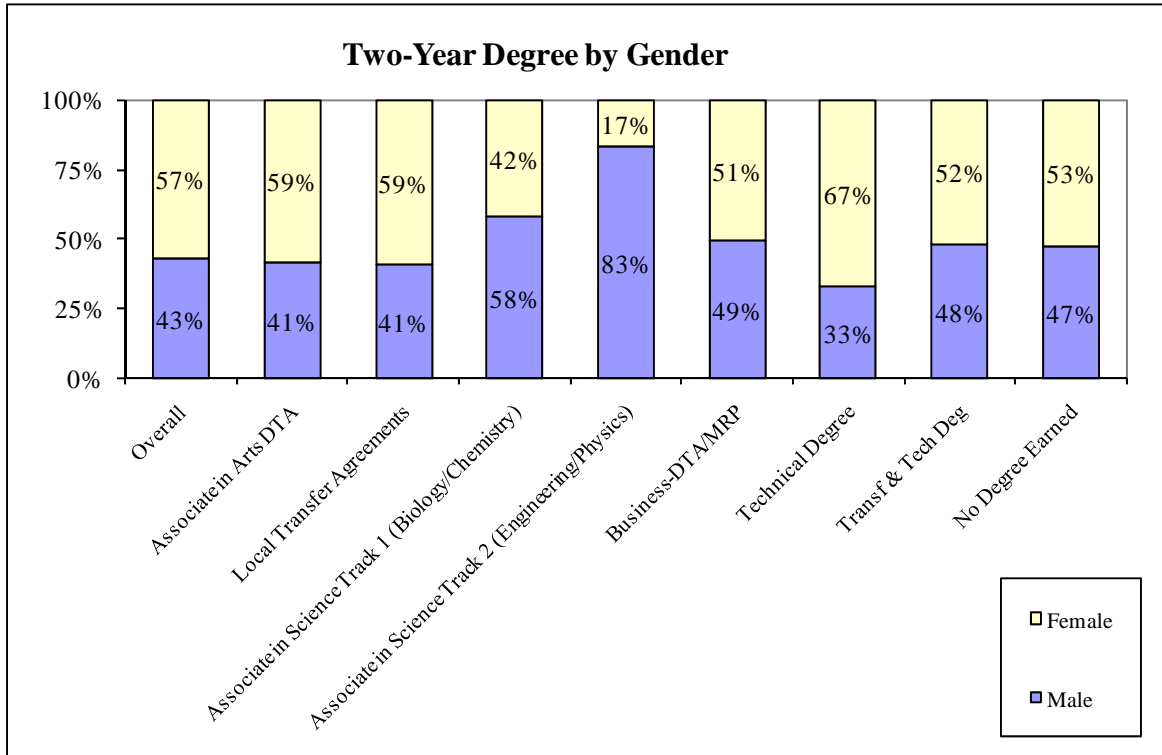


Figure 31: Two-Year Degree by Age at Graduation – Detailed Table

	Overall	Associate in Arts DTA	Local Transfer Agreements	Associate in Science Track 1 (Biology/Chemistry)	Associate in Science Track 2 (Engineering/Physics)	Business DTA/MRP	Technical Degree	Transfer & Technical Degree	No Degree Earned
Female	57%	59%	59%	42%	17%	51%	67%	52%	53%
Male	43%	41%	41%	58%	83%	49%	33%	48%	47%
Total	7,277	5,489	64	83	152	53	297	135	1,004

¹⁹ For additional information on related gender-equity issues as explored by the Higher Education Coordinating Board, please see <http://www.hecb.wa.gov/research/issues/documents/GenderEquityPolicyBrieffinal-9-07.pdf>

Two-Year Degree by Age at Graduation

Approximately half (53%) of CTC transfer graduates were under 25 years old; 26 percent were 25-29 years old; and 22 percent were over 30.

Technical degrees, either by themselves or together with a transfer degree were more common among older CTC transfer graduates; approximately 20 percent of these degree earners were under 25 years old, 30 percent were 25-29 years old, and half were over 30 years old. In contrast, traditional college age students tended to go through traditional pathways.

Figure 32

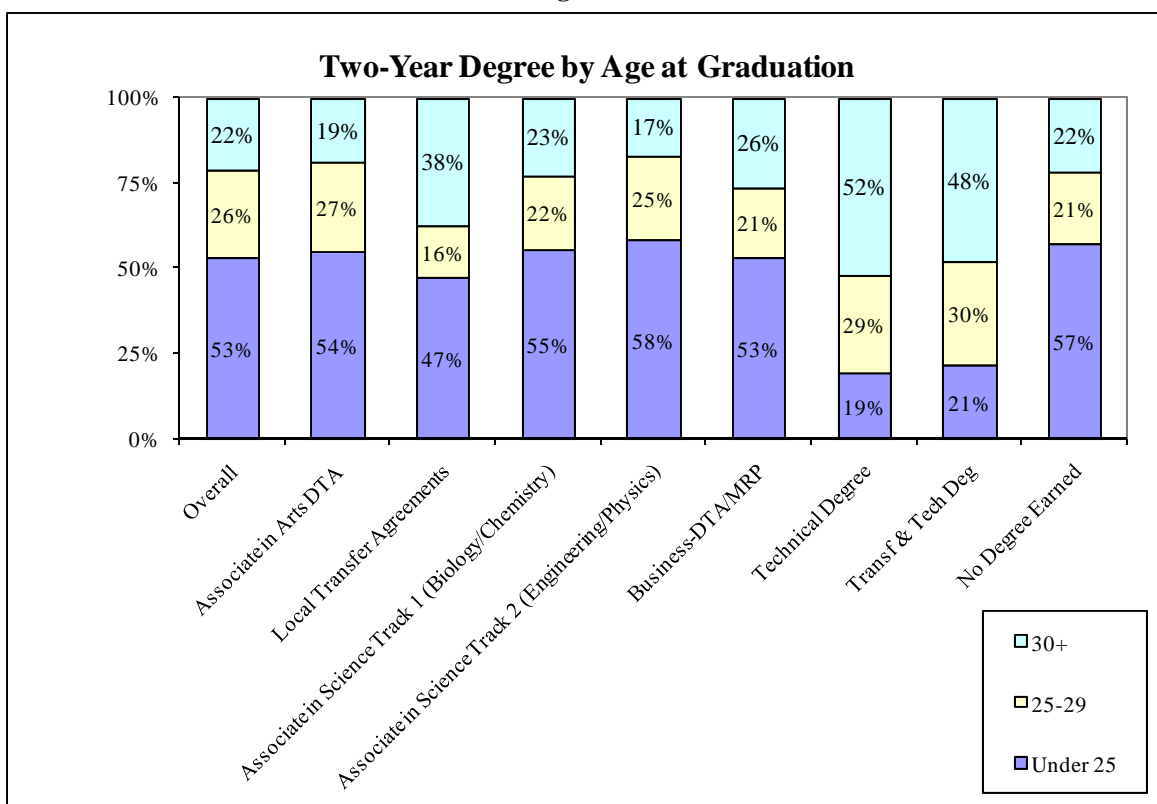


Figure 33: Two-Year Degree by Age at Graduation – Detailed Table

	Overall	Associate in Arts DTA	Local Transfer Agreements	Associate in Science Track 1 (Biology/Chemistry)	Associate in Science Track 2 (Engineering/Physics)	Business DTA/MRP	Technical Degree	Transfer & Technical Degree	No Degree Earned
Under 25	53%	54%	47%	55%	58%	53%	19%	21%	57%
25-29	26%	27%	16%	22%	25%	21%	29%	30%	21%
30+	22%	19%	38%	23%	17%	26%	52%	48%	22%
Total	7,277	5,489	64	83	152	53	297	135	1,004

Two-Year Degree by Major

As might be expected, CTC transfer students brought different two-year degrees to each baccalaureate degree major. Almost all of the students completing the Business DTA/MRP earned a bachelor’s degree in business (91%). Similarly, 95 percent of students completing an Associate in Science Track 2 (engineering/physics) completed a bachelor’s degree in a STEM-related major. Most students earning an Associate in Science Track 1 (biology/chemistry) majored in STEM (73%), health (8%), or “other” (8%).

Among the two-year degrees with less specific foci, technical degree earners were most likely to major in arts and letters (36%) or health (26%).²⁰ Students with both a technical and a transfer degree were most likely to major in business (27%) or STEM (21%). CTC transfers holding an Associate in Arts DTA were most likely to major in arts and letters (25%), social science/psychology (21%) or business (20%). (See Figure 34 and Figure 35.)

Figure 34

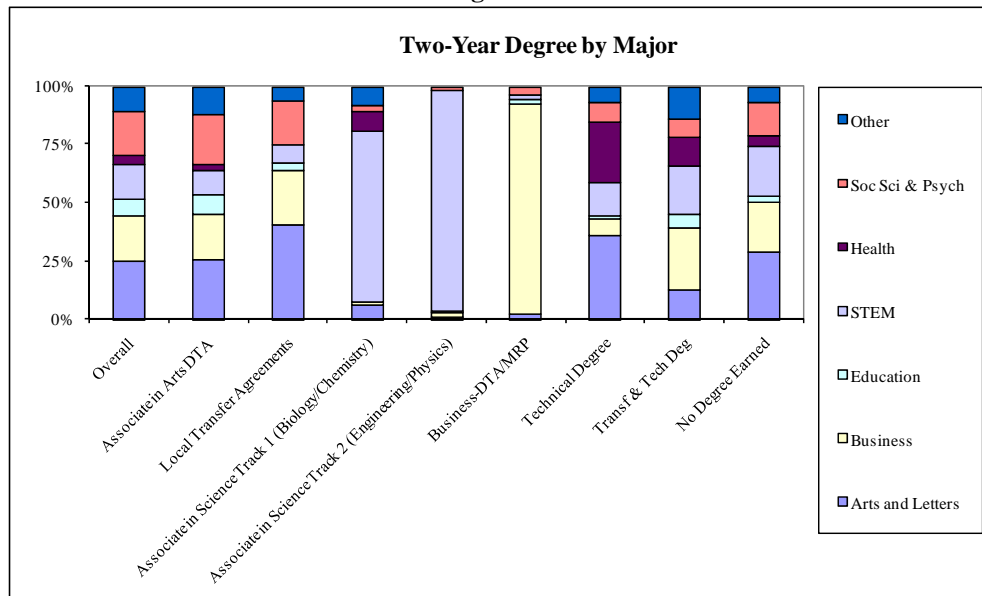


Figure 35: Two-Year Degree by Major – Detailed Table

	Overall	Associate in Arts DTA	Local Transfer Agreements	Associate in Science Track 1 (Biology/Chemistry)	Associate in Science Track 2 (Engineering/Physics)	Business DTA/MRP	Technical Degree	Transfer & Technical Degree	No Degree Earned
Arts and Letters	25.2%	25.3%	40.6%	6.0%	0.7%	1.9%	35.7%	12.6%	29.1%
Business	19.4%	19.6%	23.4%	1.2%	2.0%	90.6%	7.4%	26.7%	21.1%
Education	7.2%	8.8%	3.1%	0.0%	0.7%	1.9%	1.0%	5.9%	3.0%
STEM	14.7%	10.4%	7.8%	73.5%	95.4%	1.9%	14.8%	20.7%	21.0%
Health	4.0%	2.6%	0.0%	8.4%	0.0%	0.0%	25.6%	12.6%	4.6%
Soc Sci & Psych	18.9%	21.4%	18.8%	2.4%	1.3%	3.8%	8.4%	7.4%	14.3%
Other	10.6%	11.9%	6.3%	8.4%	0.0%	0.0%	7.1%	14.1%	6.9%
Total	7,277	5,489	64	83	152	53	297	135	1,004

²⁰ With two of the larger technical degree transfer programs in registered nursing and dental hygiene, it is not surprising that many of these transfer students earned baccalaureate degrees in health-related majors.

Two-Year Degree by Campus Type

Slightly more than a third of CTC transfer students enrolled at research universities (37%) and slightly less than a third enrolled at regional comprehensive universities (32%). Large numbers also enrolled at branch campuses (19%) and at centers (12%) to complete their four-year degree.

Students earning Associate in Science Track 1 (biology/chemistry) and Track 2 (engineering/physics) degrees were much more likely to enroll at research universities (67% and 77% respectively) than students earning other two-year degrees. Students earning degrees under Local Transfer Agreements and Technical Degrees tended to enroll at centers (19% and 21% respectively) and at branch campuses (25% and 34% respectively). About half (47%) of the graduates who earned a Business DTA/MRP completed their degree at a branch campus. (See Figure 36 and Figure 37.)

Figure 36

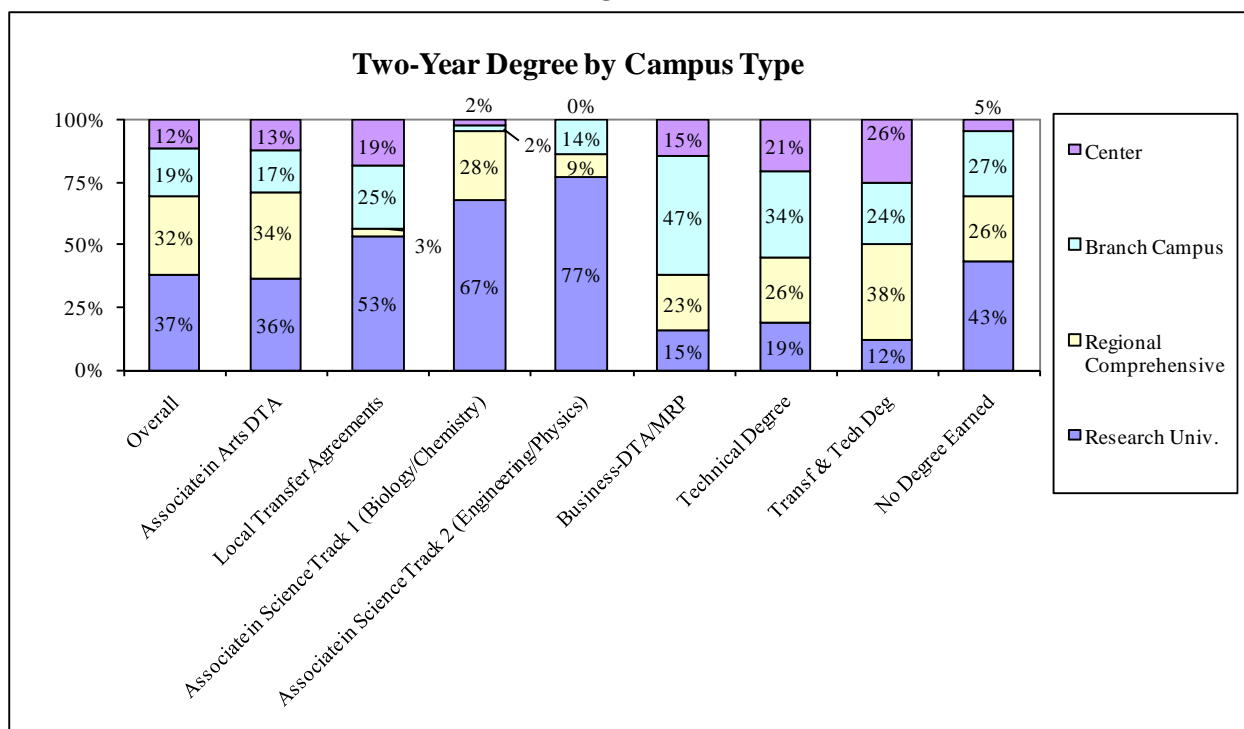


Figure 37: Two-Year Degree by Campus Type – Detailed Table

	Overall	Associate in Arts DTA	Local Transfer Agreements	Associate in Science Track 1 (Biology/Chemistry)	Associate in Science Track 2 (Engineering/Physics)	Business DTA/MRP	Technical Degree	Transfer & Technical Degree	No Degree Earned
Center	12%	13%	19%	2%	0%	15%	21%	26%	5%
Branch Campus	19%	17%	25%	2%	14%	47%	34%	24%	27%
Regional Comp	32%	34%	3%	28%	9%	23%	26%	38%	26%
Research Univ	37%	36%	53%	67%	77%	15%	19%	12%	43%
Total	7,277	5,489	64	83	152	53	297	135	1,004

COMPARING CREDITS OF GRADUATES IN PATHWAYS FOR BUSINESS AND STEM

During the past 10 years, the higher education system created new statewide agreements for students preparing at the associate degree level to move into specific university majors with more than a few lower division course requirements. These agreements were forged by faculty and administrators in the specific majors, reviewed by the Joint Access Oversight Group (JAOG) and approved by the universities that offer each degree and by the community and technical college vice presidents of instruction. These pathways help students move more efficiently from the two-year to the four-year college system and earn their degree.²¹ Two of these degree tracks, MRP-Business and Associate of Science Track 1 and Track 2, had enough graduates in the Class of 2006 to look at the number of credits taken prior to graduation.

It is important to keep in mind that the difficulties with degree data discussed in prior chapters and in Appendix 5 apply to this section. EWU did not have any transfer credits in the file extracts provided for this study. Both EWU and CWU were missing early credits for courses taken prior to a data system conversion.²² Data for the four-year colleges included only credits attempted, while transfer credits were only requested as “earned” values.

To mitigate some of these difficulties, the study population for this section only includes CTC transfers that had a total of at least 180 quarter credits earned/attempted. Only students who earned a bachelor’s degree in business (N=1,211) are included in the Business-MRP section and only students who earned a degree in a STEM-related major (N=1,008) are included in the Associate of Science Track 1 and Track 2 section. Students who completed the specialized transfer degree are compared to the traditional DTA track, students who did not complete a degree, and students who completed a different type of degree.

Business-MRP

As discussed earlier in this section, 91 percent of the 53 Business DTA/MRP students majored in business. Among the 1,211 CTC transfers who majored in business at the baccalaureate level for whom we have enough credits to do this analysis, 44 (4%) earned a Business DTA/MRP degree. Most (76 percent) earned a DTA degree, 6 percent earned another degree, and 14 percent did not earn a degree before transferring.

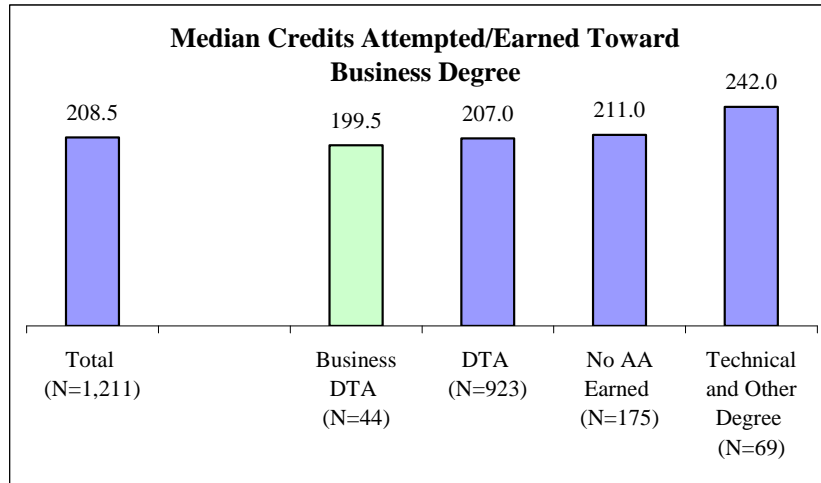
Overall, business majors averaged 208.5 quarter credits attempted/earned from all colleges attended.²³ The typical number of credits was lowest for the Business DTA/MRP students (199.5). This was 7.5 credits lower than the DTA completers, 11.5 credits lower than students who did not complete a degree, and 42.5 credits lower than students who entered a baccalaureate institution with a technical or other two-year degree.

²¹ See the current agreements at: http://www.sbctc.ctc.edu/college/_e-transferdegrees.aspx - arts and science Major Related Programs (MRPs) http://www.sbctc.ctc.edu/college/_e-transferassocinscience.aspx - engineering and chemistry pathway - the Associate in Science - Transfer degree

²² There was no data for CWU prior to the 2004-05 academic year, and data prior to 2002-03 was not available for EWU.

²³ The “average” or “typical number” of credits was computed as a median. The median is the midpoint of the range, where half of the graduates attempted/earned more credits than this and half attempted/earned less.

Figure 38

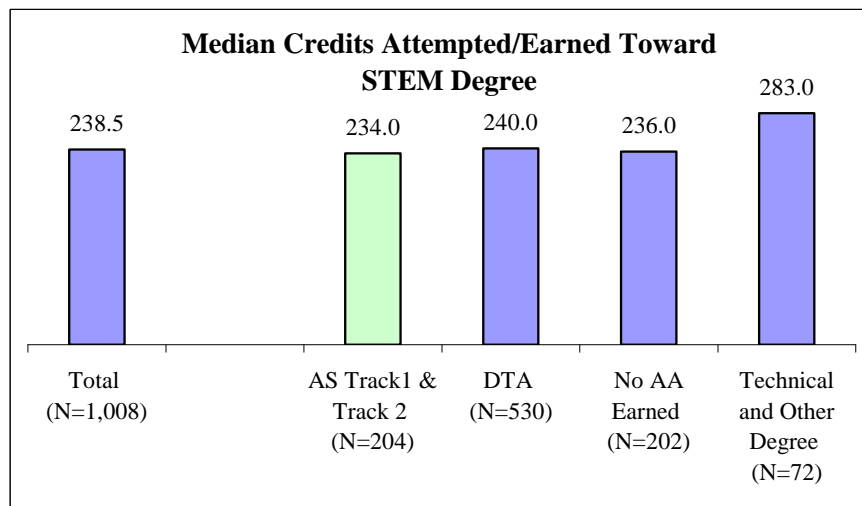


Associate of Science Track 1 and Track 2

Science Track 1 and Track 2 both had high percentages of degree earners major in STEM-related fields: 74 percent of the 83 Associate in Science Track 1 and 95 percent of the 152 Associate in Science Track 2 students majored in a STEM field. Among the 1,008 CTC transfers who majored in STEM at the baccalaureate level for whom we have enough credits to do this analysis, 204 (20%) earned an Associate of Science Track 1 or Track 2 degree. Most (53%) earned a DTA degree, 7 percent earned another degree, and 20 percent did not earn a degree before transferring.

Overall, STEM majors averaged 238.5 quarter credits attempted/earned from all colleges attended. The typical number of credits was lowest for the Science Track 1 and Track 2 students (234). Total credits for students who entered without a degree was almost identical (236). The Science Track 1 and Track 2 is 6 credits lower than DTA earners, and it is 49 credits lower than students who completed another degree before transferring.

Figure 39



TWO-YEAR DEGREES -- SUMMARY

- The longstanding statewide transfer degree for majors in fields other than engineering, chemistry and physics – the DTA or its related MRPs (in this study, Business MRP) was the normative path to transfer; 76 percent of CTC transfer baccalaureate graduates completed the DTA or Business DTA/MRP. The newer statewide agreement for transfer to engineering, chemistry and physics – the AS-T was completed by 3 percent of transfers. Six percent of transfers completed a technical degree.
- Overall, 86 percent of CTC transfers completed a degree, which is 12 points higher than the 74 percent reported for the Class of 2001.
- The percentage of students transferring without a degree was consistent across ethnic groups, with the exception of Hispanic students; 93 percent of Hispanic CTC transfers earned a degree, compared to 86 percent of other groups.
- Among specific types of two-year degrees, African American and Native American students were more likely than other groups to earn technical degrees. Asian American students were more likely than others to complete an Associate in Science Track 2.
- Males and females pursued different types of degrees. Females were much more likely to have completed a technical degree (67% female). Males were much more likely to complete the Associate in Science Track 1 (83% male) and Track 2 (58% male).
- Almost half (47%) of CTC transfer graduates were over 25 years old. The Associate in Arts DTA and technical degrees were more common for older graduates. The Associate in Science Track 2 (engineering/physics) were more common among the younger graduate transfers.
- CTC transfer students brought different two-year degrees to each baccalaureate degree major. Almost all of the students completing the Business DTA/MRP earned a bachelor's degree in business. Similarly, 95 percent of students completing an Associate in Science Track 2 (engineering/physics) completed a bachelor's degree in a STEM-related major. Most students earning an Associate in Science Track 1 (biology/chemistry) majored in either STEM or health.
- Students earning Associate in Science Track 1 (biology/chemistry) and Track 2 (engineering/physics) degrees were much more likely to enroll at research universities (67% and 77% respectively) than students earning other degrees.
- Students earning Local Transfer Agreement and technical degrees tended to enroll at centers and at branch campuses.
- Graduates earning Business DTA/MRP or Associate in Science Track 1 or Track 2 degrees took fewer credits than those who did not use these specialized tracks.

APPENDIX 1: TECHNICAL WORKGROUP MEMBERSHIP

The following individuals served on the Technical Workgroup for this project. Their consultation was invaluable to understanding the data and making appropriate use of it. However, the final report is the responsibility of WSU-SESRC and the Technical Workgroup shares no blame for any errors or omissions.

Public 4-Year

Michael Reilly, Council of Presidents
Kelley Cadman, Central Washington University
Mark Lundgren, Central Washington University
Shannon Carr, Eastern Washington University
Theresa Martin, Eastern Washington University
Laura Coghlan, The Evergreen State College
Doug Scrima, The Evergreen State College
Phil Hoffman, University of Washington
Cathy Fulkerson, Washington State University
Fran Hermanson, Washington State University
Susan Poch, Washington State University
Jeanne Gaffney, Western Washington University
Sharon Schmitz, Western Washington University
Judy Korski, Western Washington University

Public 2-Year

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Mary Ann Medlin, Centralia College
Susan Maxwell, Clark College
John Olson, Everett Community College
Jeff Wagnitz, Highline Community College
Marsha Brown, Seattle Community Colleges
Kathy Lindgren, Walla Walla Community College
Wendy Samitore, Walla Walla Community College

Independent Colleges

Violet Boyer, ICW
Mike Gabowski, Gonzaga University
Shari Rasmussen, Gonzaga University
Joan Sarles, Gonzaga University
Heather Treshome, Gonzaga University
Mike Buttery, Heritage University
Karl Stumo, Pacific Lutheran University
Kim Van Vleet, Saint Martin's University
Robert Duniway, Seattle University
Ben Mauk, University of Puget Sound

Agencies

Randy Spaulding, HECB
Jim West, HECB
Loretta Seppanen, SBCTC
Carmen Stewart, SBCTC
Scott Copeland, SBCTC
Michael Gass, OFM
Melissa Beard, OFM

APPENDIX 2: MAJORS DEFINED AND GROUPED

IDENTIFYING TEACHERS

Because not all teachers necessarily major in education in college, the analysis used student transcript records to identify those graduates who had taken a student teaching course (typically the culminating element of teacher certification programs).

Conversations with staff from the teacher education programs named the following courses as a means of identifying people who should be considered as teachers for the purposes of this study. Anyone enrolled in at least one of these courses was identified as a teacher, and their major was changed to education if they were not already an education major.

WWU

ELED 494
 ELED 494a
 SPED 498a
 SPED 498b
 SPED 498c
 SEC 495

CWU

EDUC423
 EDUC426

WSU

T&L415

EWU

EDCS442

GROUPING MAJORS

Each degree was associated with a Classification of Instructional Program (CIP) six digit code which was used to identify the graduate’s major. With the exception of CIP codes starting with 30, all two-digit CIPs could be classified into a single major category. These categories were further grouped into Clusters for the purposes of this report.

For those students who earned multiple degrees, a ranking system developed by SBCTC was applied to identify the single major for classifying this graduate. For example, if a student earned two degrees, one in “09” Communications and the other in “13” education, they were considered an education major since it has a ranking of 7 compared to 28 for CIP codes starting with “09”.

2 or 6-digit CIP Code	Cluster for Report	CIP Title	Ranking
01.	Other	Ag & Natural Conservation	33
03.	Other	Ag & Natural Conservation	32
04.	STEM	Engineering, CIS, & Architecture	31
05.	Arts and Letters	Humanities	30
09.	Arts and Letters	Communications	28
10.	Arts and Letters	Communications	29
11.	STEM	Engineering, CIS, & Architecture	1
13.	Education	Education & Teaching	7
14.	STEM	Engineering, CIS, & Architecture	2
15.	STEM	Engineering, CIS, & Architecture	3

2 or 6-digit CIP Code	Cluster for Report	CIP Title	Ranking
16.	Arts and Letters	Arts and Letters	27
19.	Other	Ag & Natural Conservation	26
22.	Other	Law	25
23.	Arts and Letters	Arts and Letters	24
24.	Arts and Letters	Humanities	23
26.	STEM	Science & Math	10
27.	STEM	Science & Math	8
30.0101	STEM	Science & Math	11
30.0801	STEM	Science & Math	12
30.1601	Business	Business	5
30.1801	STEM	Science & Math	13
30.2001	Arts and Letters	Humanities	21
30.2401	STEM	Science & Math	14
30.9999	Arts and Letters	Humanities	22
31.	Other	Ag & Natural Conservation	20
38.	Arts and Letters	Humanities	19
40.	STEM	Science & Math	9
42.	Soc Sci & Psych	Psychology	18
43.	Soc Sci & Psych	Social Sciences-Applied	15
44.	Soc Sci & Psych	Social Sciences-Applied	17
45.	Soc Sci & Psych	Social Sciences-General	34
49.	Other	Trades	36
50.	Arts and Letters	Arts and Letters	16
51.	Health	Health	6
52.	Business	Business	4
54.	Soc Sci & Psych	Social Sciences-General	35
99.	Other	Unknown	37

APPENDIX 3: LIST OF ALL CENTERS AND THEIR RELATED UNIVERSITIES (AS OF JUNE 2006)

CWU: Des Moines
Lynnwood
Moses Lake
Pierce County
Wenatchee
Yakima

EWU: Bellevue College
Clark College
Health Sciences Building
International
Kent
Pierce Community College
Riverpoint
Shoreline Community College
SIRTI
South Seattle Community College
Spokane
Walla Walla
Multiple Sites

TESC: Grays Harbor
Quinault Reservation
Tacoma Campus

WWU: Bremerton
Everett
Kitsap
Oak Harbor
Port Angeles
Seattle Urban Center
South Seattle Center
Multiple Sites

WSU: Aberdeen/Grays Harbor College
Bellingham/NWIC
Centralia College
Distance Degree Program
Everett/University Centers
International
Longview/LCC
Prosser School District
Puyallup/Pierce College
Renton/King County Coop Ext
Seattle/Boeing
Spokane Or Yakima/ICN
University Of Idaho
Walla Walla Community College
Wenatchee Valley College
Wenatchee/CCCE
Yakima/YVC

APPENDIX 4: TRANSFER STATUS DEFINED

DEFINITION OF TRANSFER STATUS VARIABLE

Students were categorized as CTC transfer, other transfer, and direct entry using the following rules:

Earned a degree from a CTC	CTC Transfer
Transferred Credits ≥ 40 and CTC Credits $> 50\%$ of Transf. Credits	CTC Transfer
Transferred Credits ≥ 40 and CTC Credits $\leq 50\%$ of Transf. Credits	Other Transfer
Transferred Credits < 40	Direct Entry

In addition:

- All CTC college level credits earned were counted as “transferred credits” whether or not the college counted them towards the bachelor’s degree
- All credits not counted among “transferred credits” were assumed to be completed at a Washington public baccalaureate institution. As a result, students who transferred from one baccalaureate institution to another were not identified within either of the transfer cohorts.
- Direct entry students with fewer than 140 attempted credits at the home institution were identified separately as “Unknown” in Figure 10 and Figure 20 and grouped with the direct entry students in all other figures and computations.

DIFFERENCES WITH PRIOR STUDY

In the prior study on the Class of 2001, it was assumed that all students with fewer than 180 quarter credits at the time of graduation had transferred in the remainder of those credits. For example, if a student graduated with a total of 140 quarter credits in the available transcript records, it was assumed that the student had an additional unknown 40 credits and was therefore classified as a transfer student.

In the study for the Class of 2006, it was clear that there were at least two reasons why data might be missing. These data quality issues are discussed in Appendix 5:

- There were no transferred credits for students who had enrolled at multiple public baccalaureate universities in Washington State.
- EWU and CWU upgraded their data systems and, in that process, changed the student ID numbers. This made tracking individual students through PCHEES problematic, so not all credits attempted were included in this study.

The study team did not have credits earned by class or total credits earned. Only credits attempted at the home university were available.

A second difference is that this study treated enrollments at multiple campuses within a college to be direct entry credits. The study for the Class of 2001 counted all credits by location, not by the larger university.

For example, if a student graduated from the CWU center in Moses Lake with 80 credits from CWU in Ellensburg:

- The current study (Class of 2006) considered this student to be a direct entry student and the 80 CWU-Ellensburg credits were not considered as ‘transfer credits’.
- The prior study (Class of 2001) considered this student to be an ‘other transfer’ student with 80 transferred credits.

For this reason, even though CWU-Moses Lake only offers upper division classes, there were some graduates who were not counted as “transfer” students.

APPENDIX 5: DATA CHALLENGES

This project was the first attempt to use the newly expanded PCHEES data set for detailed ad hoc analysis. This report was limited by several data challenges in using the PCHEES extracts. These are discussed for the benefit of other researchers who attempt to use PCHEES data for similar studies. Some of these problems are “teething” problems in implementation, which should diminish as the PCHEES process becomes regularized. Others may be inherent limitations of the current database design.

The extract used in this study had limited data on credits. Particularly difficult issues were:

- Credits completed at public baccalaureate universities. The PCHEES extract only included the number of credits attempted. There was no information on either whether those credits were completed or the grade earned in the class.
- Institutions from which students successfully transferred credits were not identified.
- Credits for distinct dual credit programs in which students earned college credit before high school graduation were not identified at the program level. Only the total credits from Running Start, Tech Prep, Advanced Placement, and other dual credit opportunities were reported, and it was not reported by all colleges. As such, it was not possible to determine the contributions of each specific dual credit program to baccalaureate education.
- Total credits earned toward a baccalaureate degree was also not available for the study.

In addition, there were several instances of inconsistently reported or missing credits where they were expected:

- EWU did not report any transfer credits in PCHEES.
- The files on graduates included course level data only from the umbrella institution from which they graduated and not on credits they transferred from another Washington public baccalaureate. For example, CWU credits transferred by a student arriving at UW had no course detail in the tables supplied for the study. It was not known if these baccalaureate-to-baccalaureate credits were unaccounted for or if they were lumped in with all other undifferentiated credits accepted at time of transfer.
- Within the period covered by this study, both CWU & EWU switched from an SSN-based data system to a system not reliant on SSN. Student records for courses taken prior to the system transition were not included in the study database, and as a result, not all credits attempted by CWU and EWU graduates were included in this study. Data for graduates at EWU was only available from the fall of 2002 forward. Data for graduates of CWU was only available from the fall of 2004 forward. All other colleges had data going back at least to the fall of 2001.

Finally, there were a number of errors in matching data which delayed this study. Because PCHEES has a relational structure, (different groups of data elements require separate matches) it is possible to get inaccurate results if the matches used on different tables are not equivalent. This suggests that prior to analysis, PCHEES extracts should be examined for expected population size, duplication of IDs with other files, and other matching issues prior to analysis.

In addition to difficulties with PCHEES data, the data provided by four independent colleges in Washington appeared to have only included graduates with some transfer credits, rather than the records of all graduates. Without information on direct entry students, data from independent colleges could not be included in this study.