The Relationship of Momentum Points, Placement Results, and Student Service and Instructional Strategies to the ARCC SPAR Milestones

2005 – 2006 First-Time College Six Year Cohort

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Background

Objective 1.1 in the Crafton Hills College (CHC) Enrollment Management Plan states the following: Identify systemic dropout/stop-out points for CHC students so that effective interventions can be designed and implemented. In October of 2011 the Enrollment Management Committee (EMC) decided to use the Accountability Reporting for Community Colleges (ARCC) Student Progress and Achievement Rate (SPAR) data to identify student dropout points and strategies related to student success. The SPAR cohort consists of first-time College students in 2005 – 2006 at Crafton Hills College with a minimum of twelve units earned who attempted a degree, certificate, or transfer course within six years (i.e. 2010-2011). The California Community College Chancellor's Office (CCCCO) provides each community college with the SPAR data set in March of each year. Accordingly, the CHC Office of Research and Planning (ORP) used the 2012 SPAR data provided by the CCCCO to identify dropout points and strategies related to students achieving one of the SPAR milestones: transferring to a four-year institution, transfer prepared, transfer directed, and earning a degree or certificate.

Executive Summary

The best predictor of achieving any of the SPAR transfer milestones was to successfully complete transfer level math. In addition to successfully completing transfer level math, the time it took for students to complete transfer level math also had a relationship with the SPAR transfer milestones. Specifically, students were twice as likely to transfer to a four-year institution if they successfully completed transfer level math in five years. Moreover, students were twice as likely to transfer to a four-year institution if they successfully completed 15 units in their first semester. Students were also more likely to transfer if they enrolled full-time in 4 or more semesters or enrolled in 2 or more summer semesters.

Equally important, students were more than twice as likely to be transfer prepared if they successfully completed transfer level math in four-years. Students were also twice as likely to be transfer prepared if they enrolled full-time in 4 or more semesters, or

completed 30 units within 2.5 years. In addition, students were almost twice as likely to be transfer prepared if they completed 15 units in their first semester or enrolled in 2 or more summer semesters.

The best predictor of achieving the SPAR degree or certificate milestone was to successfully complete 30 units. In addition to successfully completing 30 units, the time it took for students to complete 30 units had a relationship with the SPAR degree or certificate milestone. Specifically, students were 1.5 times more likely to earn a degree or certificate if they completed 30 units within 4 years. Moreover, students were 1.5 times more likely to earn a degree or certificate if they completed a Student Education Plan (SEP) in the first year, and over twice as likely to earn a degree or certificate if they met with a counselor 3 or more times a year. Equally important, students were twice as likely to earn a degree or certificate if they enrolled in 2 or more summer semesters.

Achieving any one of the following Milestones: Transferring to a Four-Year Institution, Transfer Prepared (60 transferable units with a 2.0 or higher GPA), Transfer Directed (successfully completing transfer level math and English), or Earning a Degree or Certificate of 18 or more units

Predictor of Achieving Any Milestone

- Successfully completing transfer level math is the best predictor of achieving any milestone
- Completing 30 units in 3.5 years is the second best predictor of achieving any milestone for students who do not successfully complete transfer level math

Hurdles to Achieving Any Milestone

- Students are statistically significantly and substantially *less likely* to achieve any milestone if they…
    - Place into 2 or 3 basic skills courses
    - Assess after they have enrolled in their first course

Increasing the Likelihood of Achieving Any Milestone

- Students are statistically significantly and substantially *more likely* to achieve any milestone if they…
    - Place into a transfer level math course
    - Place into a transfer level English course

Momentum Points for Achieving Any Milestone

- Students are statistically significantly and substantially *more likely* to achieve any milestone if they…
    - Complete transfer level math within 6 years
    - Complete 30 units within 2 years
    - Complete college level math within 1 year
    - Complete transfer level English within 1 year
    - Complete basic skills math within 4 years
    - Complete 15 units in their first semester

Student Services Strategies for Achieving Any Milestone

- Students are statistically significantly and substantially *more likely* to achieve any milestone if they…
    - Update their SEP after completing an SEP in their first year
    - Meet with a counselor 6 or more times

Instructional Strategies for Achieving Any Milestone

- Students are statistically significantly and substantially *more likely* to achieve any milestone if they…
    - Enroll full-time in 5 or more semesters
    - Enroll in 2 or more summer semesters
    - Visit the Tutoring Center at least once

Transferring to a Four-Year Institution

Predictor of Transferring to a Four-Year Institution

- Successfully completing transfer level math is the best predictor of transferring to a four-year institution

Hurdles to Transferring to a Four-Year Institution

- Students are statistically significantly and substantially *less likely* to transfer if they…
    - Place into 2 or 3 basic skills courses
    - Assess after they have enrolled in their first course
    - Applied for and received financial aid

Increasing the Likelihood of Transferring to a Four-Year Institution

- Students are statistically significantly and substantially *more likely* to transfer if they…
    - Place into a transfer level math course
    - Place into a transfer level English course

Momentum Points for Transferring to a Four-Year Institution

- Students are statistically significantly and substantially *more likely* to transfer if they…
    - Complete transfer level math within 5 years
    - Complete 30 units within 2 years
    - Complete transfer level English within 2 years
    - Complete college level math within 2.5 years
    - Complete basic skills math within 3.5 years
    - Complete 15 units in their first semester

Instructional Strategies for Transferring to a Four-Year Institution

- Students are statistically significantly and substantially *more likely* to transfer if they…
    - Enroll full-time in 4 or more semesters
    - Enroll in 2 or more summer semesters

Achieving Transfer Preparedness (60 transferable units with a 2.0 or higher GPA)

Predictor of Transfer Preparedness

- Successfully completing transfer level math is the best predictor of being transfer prepared

Hurdles to being Transfer Prepared

- Students are statistically significantly and substantially *less likely* to be transfer prepared if they…
    - Place into 2 or 3 basic skills courses

Increasing the Likelihood of being Transfer Prepared

- Students are statistically significantly and substantially *more likely* to be transfer prepared if they…
    - Place into a transfer level math course

Momentum Points for being Transfer Prepared

- Students are statistically significantly and substantially *more likely* to be transfer prepared if they…
    - Complete transfer level math within 4 years
    - Complete 30 units within 2.5 years
    - Complete college level math within 3 years
    - Complete transfer level English within 2 years
    - Complete basic skills math within 6 years
    - Complete 15 units in their first semester

Instructional Strategies for being Transfer Prepared

- Students are statistically significantly and substantially *more likely* to be transfer prepared if they…
    - Enroll full-time in 4 or more semesters
    - Enroll in 2 or more summer semesters

Achieving Transfer Directedness (successfully completing transfer level math and English)

Predictor of being Transfer Directed

- Successfully completing transfer level math is the best predictor of being Transfer Directed

Hurdles to be Transfer Directed

- Students are statistically significantly and substantially *less likely* to be Transfer Directed if they…
    - Place into 2 or 3 basic skills courses

Increasing the Likelihood of being Transfer Directed

- Students are statistically significantly and substantially *more likely* to be Transfer Directed if they…
    - Place into a transfer level math course

Momentum Points for being Transfer Directed

- Students are statistically significantly and substantially *more likely* to be Transfer Directed if they…
    - Complete transfer level math within 4 years
    - Complete 30 units within 2.5 years
    - Complete college level math within 3 years
    - Complete transfer level English within 2 years
    - Complete basic skills math within 6 years
    - Complete 15 units in their first semester

Instructional Strategies for being Transfer Directed

- Students are statistically significantly and substantially *more likely* to be Transfer Directed if they…
    - Enroll full-time in 4 or more semesters
    - Enroll in 2 or more summer semesters

Earning a Degree or Certificate of 18 Units or More

Predictor of earning a Degree or Certificate

- Completing 30 or more units is the best predictor of earning a degree or certificate

Hurdles to earning a Degree or Certificate

- Students are statistically significantly and substantially *less likely* to earn a Degree or Certificate if they…
    - Assess after they have enrolled in their first course

Increasing the Likelihood of earning a Degree or Certificate

- Students are statistically significantly and substantially *more likely* to earn a Degree or Certificate if they…
    - Place into a transfer level English course

Momentum Points for earning a Degree or Certificate

- Students are statistically significantly and substantially *more likely* to earn a Degree or Certificate if they…
    - Complete 30 units within 4 years
    - Complete transfer level math within 6 years
    - Complete college level math within 3 years
    - Complete transfer level English within 3.5 years
    - Complete 15 units in their first semester
    - Complete basic skills math in 1 to 3.5 years

Instructional Strategies for earning a Degree or Certificate

- Students are statistically significantly and substantially *more likely* to earn a Degree or Certificate if they…
    - Enroll in 2 or more summer semesters
    - Enroll full-time in 4 or more semesters
    - Visit the Tutoring Center at least once

Crafton Hills College

Methodology

In October of 2011 the Enrollment Management Committee (EMC) decided to use the Accountability Reporting for Community Colleges (ARCC) Student Progress and Achievement Rate (SPAR) data to identify student dropout points. The SPAR cohort consists of first-time College students at Crafton Hills College with a minimum of twelve units earned who attempted a degree, certificate, or transfer course within six years. The California Community College Chancellor's Office (CCCCO) provides each community college with the SPAR data set in March of each year. Accordingly, the CHC Office of Research and Planning (ORP) used the 2012 SPAR data provided by the CCCCO to identify dropout points and strategies related to student success.

In addition to using the SPAR data from ARCC, the EMC also discussed possible momentum or dropout points. Leinbach and Jenkins (2008, pp. 1) define momentum points as "measurable educational attainments, such as completing a college-level math course, that are empirically correlated with the completion of a milestone." The CCCCO Student Success Task Force (SSTF, 2011) refers to momentum points as progression metrics. Based on research and on discussions with the EMC, the following momentum or dropout points were identified.

- Number of terms to enroll in first math course
- Number of terms to enroll in first English course
- Number of terms to successfully complete English and reading basic skills competencies
- Number of terms to successfully complete math basic skills competencies
- Number of terms to successfully complete all basic skills competencies
- Number of terms to successfully complete 15 or more semester units
- Number of terms to successfully complete 30 or more semester units
- Number of terms to successfully complete transfer level math
- Number of terms to successfully complete transfer level English
- Number of summer terms earned a Grade on Record

In addition to the momentum points, the EMC also wanted to know if any of the following strategies and student assessment results were more or less likely to be related to students reaching a milestone (i.e. educational achievement). Some of the momentum points identified by the EMC were not examined because they did not fit methodologically with the 2005 – 2006 first-time college student cohort. Namely, students who participated in SOA^{3}R were not included because SOA^{3}R did not exist in 2005 – 2006. In addition, students who participated in Student Life were not included because a historic list going back to 2005 - 2006 of students with SIDs was not available.

Student Assessment Results

- Completed the assessment prior to the student's first section start date
- Number of basic skills placements
- Number of developmental course placements
- Number of transfer level course placements
- Math placement
- English placement
- Reading placement

Student Service Strategies

- Attended an orientation
- Met with a counselor in the student's first term at Crafton
- Met with a counselor and completed a Student Education Plan (SEP) in first year
    - Updated the SEP within six years
- Number of times met with a counselor
- Financial Aid status (received aid, denied aid, and did not apply for aid)
- Utilized services provided by the Health and Wellness Center

Instructional Strategies

- Number of times utilized the tutoring center
- Participated in a learning community
- Successfully completed a CHC or PCD course
- Number of terms students enrolled full-time

Milestones are defined by Leinbach and Jenkins (2008, pp. 1) as "…measurable educational achievements that include both conventional terminal completions, such as earning a credential or transferring to a baccalaureate program, and intermediate outcomes, such as completing…[transfer level math and English or successfully completing enough units to be transfer prepared.]" Accordingly, the following milestones were used to identify the most effective momentum points and strategies related to student success.

- Received certificate of 18 or more units
- Achieved transfer directed status (i.e. student successfully completed both transfer-level math and English courses)
- Achieved transfer preparedness (i.e. student successfully completed 60 UC/CSU transferable units with a GPA >= 2.0
- Received AA/AS Degree
- Transferred to a four-year institution

Momentum Point Definitions

Number of Terms to Enroll in Math or English

The number of terms was defined by first identifying the first term in which each student in the cohort earned a grade on record (GOR) and counting the number of primary terms only. Primary terms include fall and spring only, not summer. Summer was treated as the corresponding fall semester in generating the count for the number of terms because students often do not enroll in summer courses. For instance, Summer 2007 was treated as Fall 2007 when counting the number of terms.

Grade on Record (GOR)

Grade on record (GOR) refers to a student earning one of the following grades: A, B, C, D, F, I, NP, P, or W. A student who earned a GOR has enrolled in the course and remained in the course after the census date. The census date is the date that occurs at the 20% point after the start date of the course.

Basic Skills Competencies

Students who took the assessment and placed into college or transfer level courses were identified as needing no terms to successfully complete all of the basic skills competencies in reading, English, and math. If students, placed into a basic skills course in one or more areas the number of terms it took them to successfully complete a college level or higher course in that area was calculated. Specifically, in math, students were counted as completing their basic skills competencies when they successfully complete MATH-090, 095, or any transfer level math course. In 2005-2006 successful completion of MATH-090 or higher also met the mathematics requirement for graduation. Students were counted as completing their basic skills competency in English and reading when they successfully completed READ-078, ENGL-015, or any transfer level English course. Reading was combined with English because most students meet their graduation requirement for reading by successfully completing an English course.

15 and/or 30 Semester Units

The CCCCO Management Information System (MIS) database was used to determine the number of semesters it took students to earn 15 and/or 30 units. The field, SB16, is the number of semester units earned at Crafton. This field was used to identify the first term a student earned 15 and/or 30 or more semester units.

Number of Terms to Successfully Complete Transfer Math or English

The number of terms to successfully complete transfer level math or English is defined in the same way as described above. The first term in which each student in the cohort earned a grade on record (GOR) was identified and the number of primary terms were the only terms counted. As described previously, summer was included with the corresponding fall semester. To be included, students had to successfully complete a transfer level English or math course by earning one of the following grades: A, B, C, or CR (P).

Student Assessment Definitions

Assessed Prior to Start Date

Students who assessed prior to earning their first GOR at Crafton were identified as assessing prior to their first start date. Namely, students who completed an assessment test in either English, reading, or math prior to enrolling in their first course at Crafton were compared to students who assessed after enrolling in their first course at Crafton. A limitation to this measure is that students may have attended a course prior to enrolling in the course.

Number of Basic Skills, Developmental, and Transfer Course Placements

The number of basic skills, developmental, and transfer level course placements refers to the number of disciplines where a student placed into each level. As an illustration, a student who placed into a basic skills English, reading, and math course had three basic skills placements. Basic skills courses are courses that are below college level and are not applicable to a degree. Developmental courses include basic skills courses and courses that are degree applicable, but are not transferable to a four-year institution. Transfer course placements are courses that are transferable to a four-year institution.

Course Placements

Course placements refer to the math, English, and reading courses that students placed into when they were assessed for the first time at Crafton.

Strategy Definitions

<u>Student Services Strategies</u>

Orientation

In general, counseling contacts within an academic year included student contact with counseling from the end of the spring term in 2005 to the end of the following spring term in 2006. Specifically, students were identified as attending orientation if they had a location code of “C_COUNSEL,” a reason code of “ORIENTATION,” and an “Attend_Flag” code equal to “Y” in SARS Grid, indicating that the student attended an orientation at Crafton from May 19th, 2005 to May 17th, 2006.

Counselor in the First Term

Counseling contacts within an academic year included student contact with counseling from the end of the spring term in 2005 to the end of the spring term in 2006. Specifically, if a student met with a counselor from May 19th, 2005 to July 28th, 2005 and their first term was summer 2005; from May 19th, 2005 to December 16th, 2005 and their first term was fall 2005; or from May 19th, 2005 to May 17th, 2006 and their first term was spring 2006 then they were counted as meeting with a counselor in their first term. In addition, in order to be counted as having contact with a counselor a student had to have an "Attend_Flag" code of "Y" and a location code of "C_COUNSEL" or "C_EOPS".

Student Education Plan (SEP)

A student was identified as having completed a Student Education Plan (SEP) in their first year if they met with a counselor from May 19th, 2005 to May 17th, 2006, had a location code of "C_COUNSEL," a reason code of "SEP", and an "Attend_Flag" code of "Y". In addition, if a student developed an SEP in the first year they were also tracked to see if they updated the SEP anytime within the six years of the study: May 19th, 2005 to May 24th, 2011.

Number of Times Met with a Counselor

In order to be counted as meeting with a counselor a student had to have an "Attend_Flag" code of "Y" and a location code of "C_COUNSEL" or "C_EOPS" from May 19th, 2005 to May 24th, 2011.

Financial Aid Status

Students were identified as applying for financial aid if they were in the financial aid Datatel file (i.e. SA.XXXX) from June 20th, 2005 to May 24th, 2011 and were awarded aid, denied aid, had a note to sign, or had a pending status. The date field used to identify whether or not a student was in the award file was the date the student was added to the file (i.e. SA.ACYR.ADD.DATE). The time frame corresponds to the academic years from 2005-2006 to 2010-2011. Students were also identified as receiving aid if they had a SA.ACTION status of "A". Similarly, if students had a SA.ACTION status of "D," they were identified as applying for aid and being denied aid.

Number of Times Utilized the Health and Wellness Center

Students were counted as having utilized the Health and Wellness Center (HWC) when they had an "Attend_Flag" code of "Y" and a location code of "C_HWC" from June 20th, 2005 to May 24th, 2011. The start date of the Summer 2005 semester was used through the end of the Spring 2011 semester.

Instructional Strategies

Number of Times Utilized Tutoring Center

In order to be counted as accessing the tutoring center a student had to have an "Attend_Flag" code of "Y" and a location code of "C_LRC Tutoring". Students were only counted as accessing the tutoring center from August 8th, 2008 to May 24th, 2011 because SARS grid was not available to track students utilizing the Tutoring Center prior to August 8th, 2008.

Participated in a Learning Community

The first learning community (LC) at Crafton Hills College was offered in the Spring 2007 semester. Accordingly, students were identified as having participated in an LC if they enrolled in a LC section from Spring 2007 to Spring 2011.

Successfully Completed a CHC or PCD Course

Students were identified as successfully completing a CHC or PCD course if they earned a grade of A, B, C, or P (CR) in one of the following courses: CHC-090X4, CHC-100, PCD-050, or PCD-111. CHC-090X4 is a study skills course, CHC-100 is a student success strategies course, PCD-050 is an orientation course, and PCD-111 is a career and life planning course.

Number of Times Student Enrolled Full-Time

Each semester from Summer 2005 to Spring 2011 that a student enrolled in 12 or more units was counted as enrolling full-time.

Number of Summer Terms Earned a GOR

The number of summer terms a student earned a GOR.

Control Variable

Number of Times Student Successfully Completed an Occupational Course

Many faculty have mentioned that students are often required by many of the CHC occupational programs to utilize the HWC. Accordingly, one additional variable added to the analysis as a control variable was the number of times a student successfully completed a clearly or advanced occupational course from 2005 – 2006 to 2010 – 2011.

Statistical Analyses

Effect Size

Recognizing that statistically significant differences are often an artifact of sample size (with large samples, only minimal differences can produce statistically significant results; conversely, with small samples large outcome differences may not be identified as statistically significantly different), effect size and the 95% confidence interval (CI) for the effect size were also examined. In essence, effect size measures the strength of a relationship between two variables, controlling for the influence of sample size.

Since t-tests were initially used to explore whether statistically significant differences existed between students who completed and did not complete a milestone, the logical measure employed by the Office of Research and Planning to determine effect size was Cohen's *d*. Cohen's *d* is defined as the difference between the two means divided by the pooled standard deviation for the two means. Obtaining basic statistical data about the populations in question (means and standard deviations); researchers can easily calculate effect size. While interpretations vary, the most commonly accepted interpretations suggest that a *d* of 0.20 indicates a small effect, 0.50 a medium effect, and 0.80 or higher a large effect. Recognizing the difficulty in identifying a relationship between two variables in a quasi-experimental environment like postsecondary education, for the purposes of the current study, sufficient evidence was considered to exist if an effect size of 0.20 or higher was observed. In addition, the 95% effect size confidence interval was also used to indicate the likelihood of achieving the milestone. Specifically, a lower effect size limit higher than 0 indicates that the effect of the momentum point, assessment result, or strategy has a 95% probability of reaching the milestone.

Segmentation Modeling

A useful statistical model in identifying predictors of student success outcomes with different types of variables is the classification and regression tree (CART) modeling. This statistical application is useful in situations where the overall goal is to divide a population into segments that differ with respect to a designated criterion (Borges & Cherpitel, 2001; Hannover & Kordy2005). In short, CART modeling affords researchers the opportunity to examine the interaction and impact of a large number of distinct categorical predictor variables (e.g., gender, ethnicity, momentum points, assessment results, student services strategies, instructional strategies) on a categorical dependent variable (e.g., achieved student success outcome/did not achieve student success outcome) (Strobl, Malley, & Tutz, 2009). CART modeling initially identifies the best predictor variable, conducting a splitting algorithm that further identifies additional statistically significant predictor variables and splits these variables into smaller subgroups (SPSS, 2001; Strobl et al.). CART modeling merges categories of a predictor variable that are not significantly different. This merging, combined with the splitting algorithm, ensures that cases in the same segment are homogeneous with respect to the segmentation criterion, while cases in different segments tend to be heterogeneous with respect to the segmentation criterion.

As it relates to the current studies, segmentation modeling has a number of distinct advantages over other statistical methods traditionally used to examine categorical data (e.g., chi-square, regression analysis, etc.). Utilizing segmentation modeling, researchers can easily determine whether specific aspects of numerous categorical predictor variables interact to provide a more accurate identification of sub-populations relative to the dependent variable identified in each study (e.g., Hispanic male students might be more likely to enroll in a summer semester) (Hannover & Kordy, 2005). Additionally, since segmentation modeling evaluates all of the values of each potential predictor variable for statistically significant differences, it can be assumed that variables that are not included in the final model do not differ in respect to the dependent variable (e.g., if ethnicity does not load as a predictor of transferring to a four-year institution, it can be assumed that ethnicity is not a predictor variable and

statistically significant differences do not exist by ethnic group in regard to predicting transfer). Finally, segmentation modeling can be displayed in an easy-to-visualize decision tree, producing results that are easier to interpret and more user-friendly than traditional exploratory statistical methods.

For each student success outcome, the tables on the following page identifies:

1. The dichotomous dependent variable (i.e. milestones).
2. The independent variables employed. When an independent variable was found to be statistically significantly related to a student success outcome, if possible, the number of terms (e.g.: # of terms to complete transfer level math) or times (# of times saw a counselor) to achieve the independent variable was included in a separate model by itself to inform the development of proactive strategies to help students achieve the outcome. These were noted in the following table (e.g.: # of terms to complete transfer level math).

Study Matrix
Variables Incorporated in Each Study

Dependent Variable	**Independent Variables**				
Milestones	Demographics	Momentum Points	Assessment Results	Student Services Strategies	Instructional Strategies
Achieved any milestone (i.e. SPAR) (Y/N)	Gender	Completed Transfer Math (Y/N) (# of years)	Assessed prior to first GOR (Y/N)	Attended Orientation in First Year (Y/N)	Accessed Tutoring Center (Y/N) (# of times)
Transferred to Four-Year Institution (Y/N)	Ethnicity	Completed Transfer English (Y/N) (# of years)	2 or 3 Basic Skills Placements (Y/N)	Saw a Counselor in First Term (Y/N)	Successfully Completed CHC/PCD Course (Y/N)
Transfer Prepared (Y/N)	Age Range	Completed College Level Math (Y/N) (# of years)	2 or 3 College Level Placements (Y/N)	Student Education Plan (SEP) in First Year (Y/N)	Full-Time Student (Y/N) (# of years)
Transfer Directed (Y/N)		Completed College Level English (Y/N) (# of years)	1 or more Transfer Level Placements (Y/N)	Updated SEP if created one in First Year (Y/N)	Participated in Learning Community (Y/N)
Earned Degree or Certificate (Y/N)		Completed Basic Skills Math (Y/N) (# of years)	Transfer Math Placement (Y/N)	Saw a Counselor (Y/N) (# of times)	Enrolled in Summer Term (Y/N) (# of summer years)
		Completed 15 units (Y/N) (# of years)	Transfer English Placement (Y/N)	Applied for Financial Aid (Y/N)	
		Completed 30 units (Y/N) (# of years)	Transfer Reading Placement (Y/N)	Received Financial Aid (Y/N)	
				Denied Financial Aid (Y/N)	
				Accessed the Health & Wellness Center (Y/N) (# of times)	

Sample

The CCCCO ARCC SPAR data file identified 924 Crafton students as first-time college Crafton students in 2005 – 2006 with a minimum of 12 units earned and who attempted a degree, certificate, or transfer course within six years from 2005 – 2006 from 2010 – 2011. Eight of these students were identified as having completed a course at Crafton prior to 2005 – 2006, and were excluded from the study. In addition, 11 students had identification numbers that were not in Crafton's MIS database (i.e. Datatel) and were also excluded from the study. Specifically, 905 students were included in the study and 19 (2.1%) were excluded.

Figure 1 illustrates the number and percent of students who achieved each milestone. For instance, 50% of the students in the cohort achieved at least one of the five milestones. The milestones of earning a degree or certificate were combined because only 23 students in the cohort earned a certificate. Students in the cohort were most likely (37%) to successfully complete transfer level math and English (i.e. Transfer Directed), followed by transferring to a four-year institution (31%).

Figure 1: CHC 2005-2006 First-Time College Students Six-Year Milestone Achievement Totals.

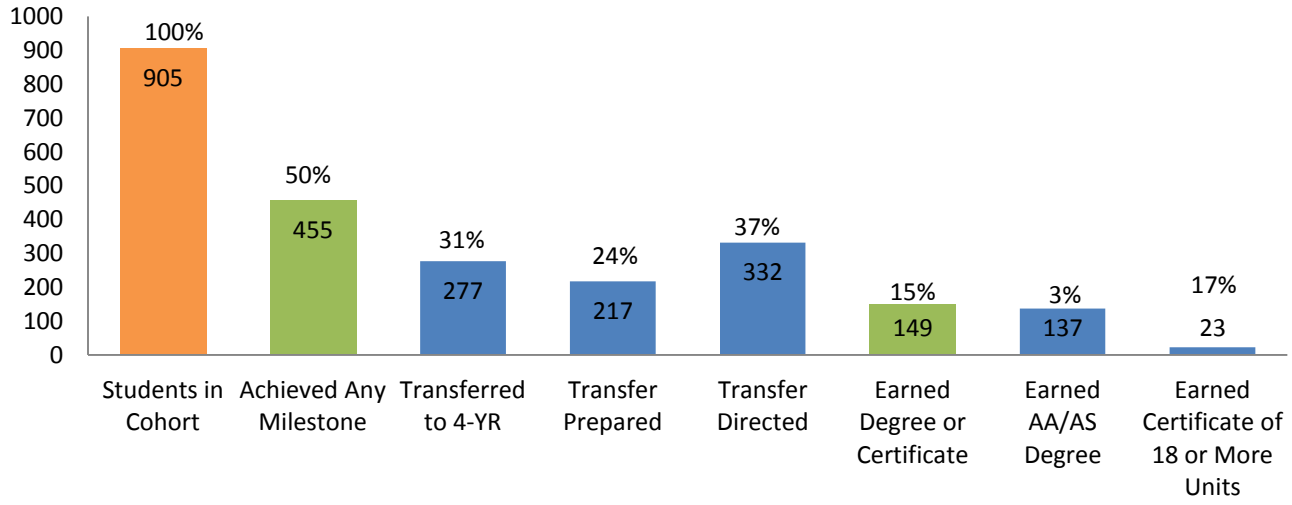


Figure 2 illustrates the number and percent of students who achieved each momentum point. For instance, 61% of the students in the cohort successfully completed transfer level English. The momentum points of earning a GOR in English and math were not examined because most students earned a GOR in English (90%) and math (86%). However, successfully completing college level English was included in the study, even though 98% of the students in the cohort achieved this outcome, to determine if the time to complete college level English was related to achieving a milestone. Students in the cohort were least likely (36%) to successfully complete transfer level math, followed by completing 30 units (54%).

Figure 2: CHC 2005-2006 First-Time College Students Six-Year Momentum Point Achievement Totals.

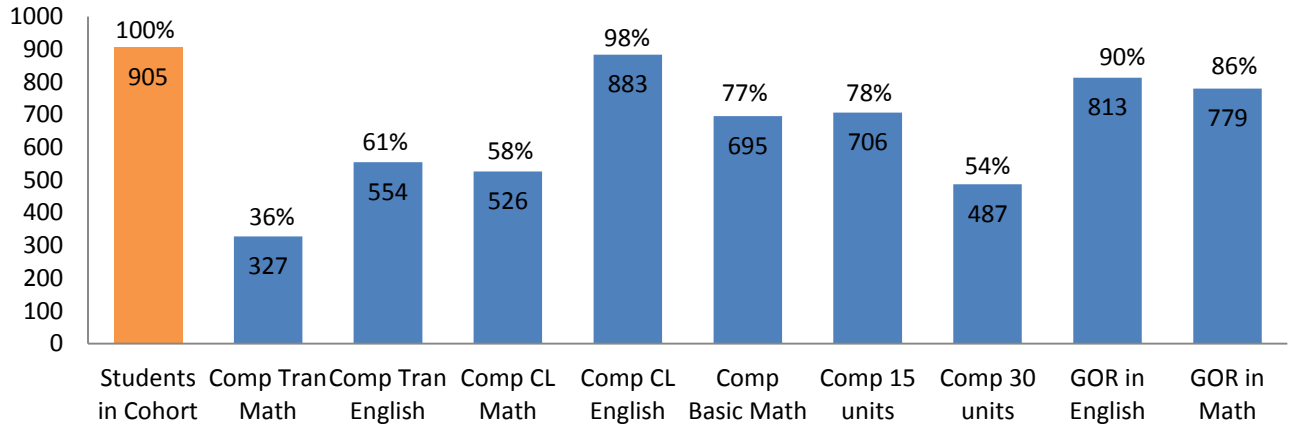
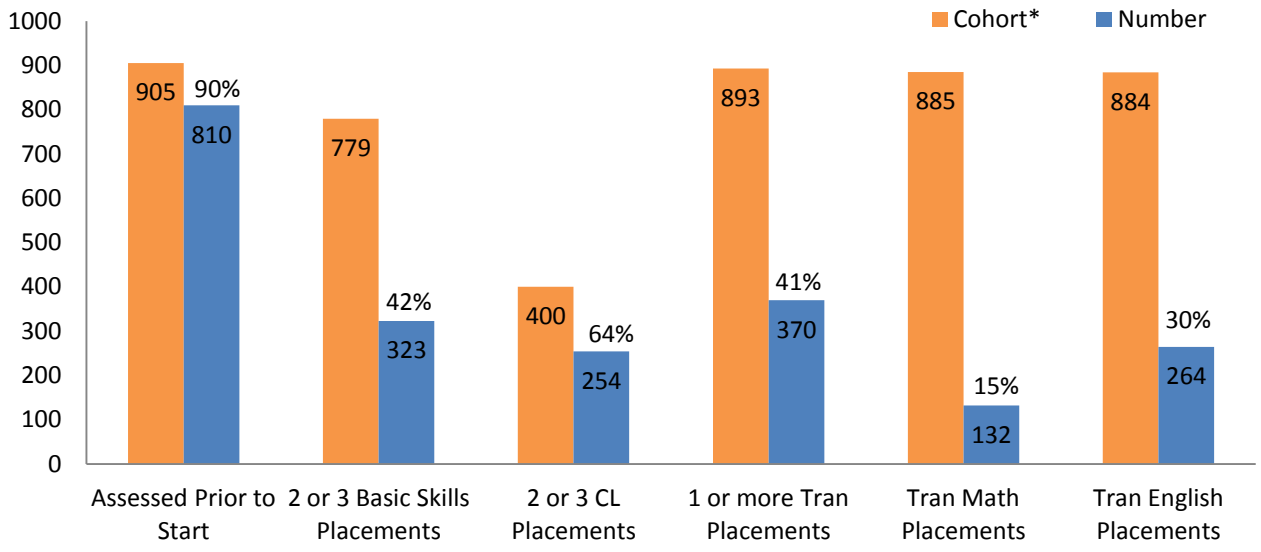


Figure 3 illustrates the number and percent of students who were assessed and the assessment results for each student in the cohort. Ninety percent of the students completed at least one assessment in English, reading, or math. As a result, assessment results were not available for every student. The assessment data was obtained from Datatel in 2005 – 2006. The placement results for English and math appear to be correct; however, the results for reading do not appear to be correct because there was a large discrepancy between the percent of students who place into transfer level reading in 2009-2010 and those who placed into transfer level reading 2011-2012. Namely, in 2009 – 2010 45% of the students tested in reading placed into transfer level reading (Wurtz, April, 2010); whereas, the historical reading placement data only identified 12% of the students in the cohort placing into transfer level reading. Accordingly, placing into reading was excluded from the study. Students in the cohort were least likely to place into transfer level math (15%).

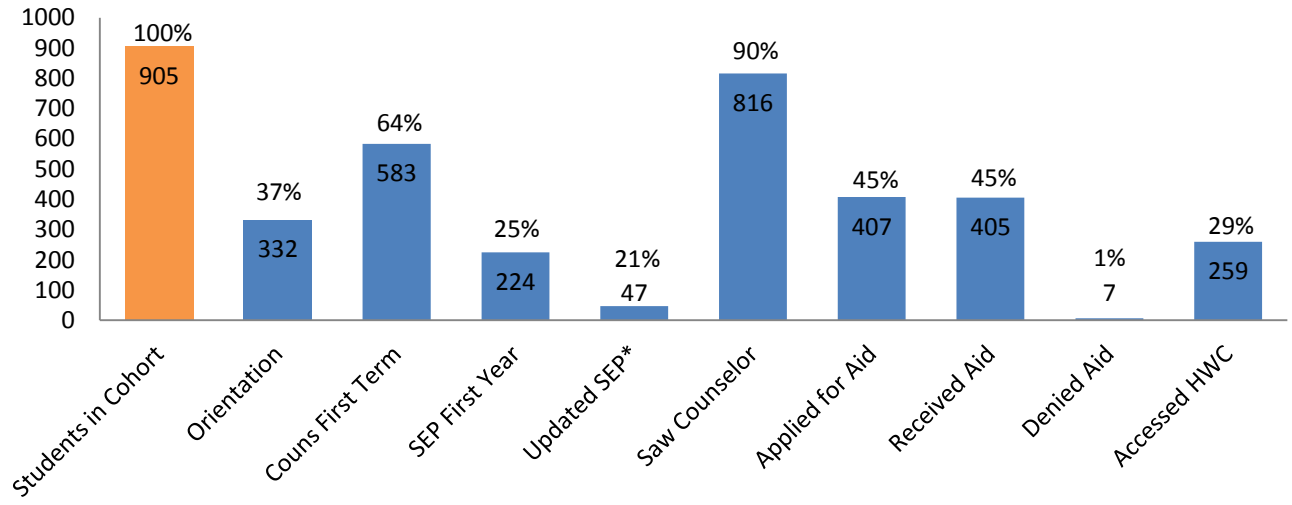
Figure 3: CHC 2005-2006 First-Time College Students Assessment Result Totals.



*The cohort changed based on the number of students with assessment results.

Figure 4 illustrates the number and percent of students in the cohort that had contact with a student service strategy for increasing the likelihood of student success. For instance, 90% of the students in the cohort saw a counselor at least once in six years and 64% of the students saw a counselor in their first term at Crafton. Almost all of the students who applied for financial aid in the cohort, also received financial aid. Students who utilized the Health and Wellness Center (HWC) were also examined to see if any relationships identified with the HWC existed for both occupational and non-occupational students.

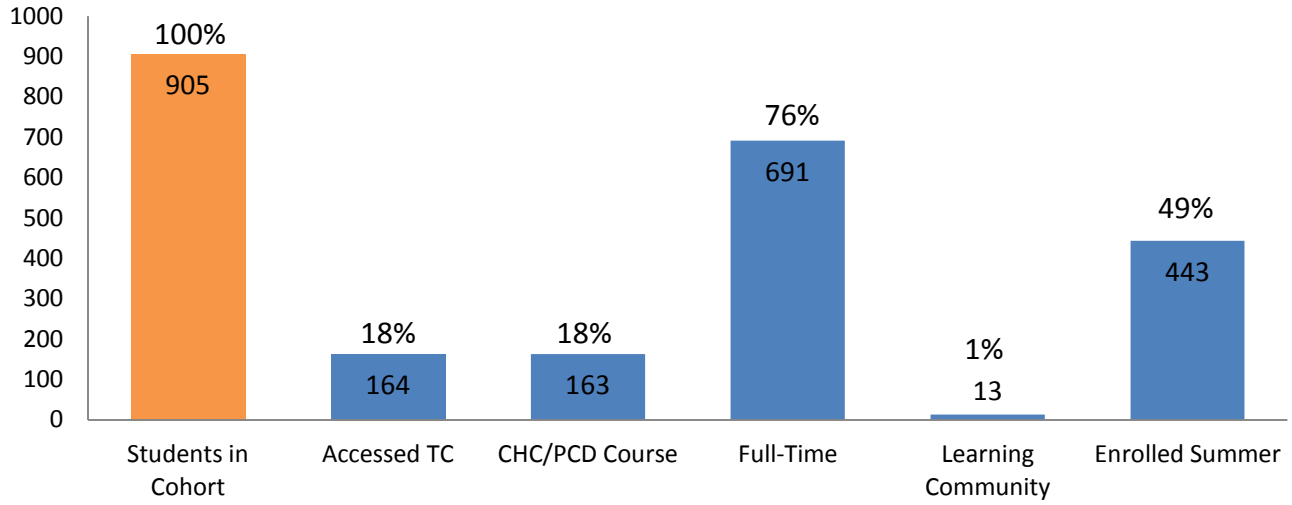
Figure 4: CHC 2005-2006 First-Time College Students Six-Year Student Services Strategies Totals.



*The denominator only includes the 224 students who completed an SEP in the first year.

Figure 5 illustrates the number and percent of students in the cohort that had contact with an instructional strategy for increasing the likelihood of student success. For instance, 70% of the students in the cohort attended Crafton full-time for at least one semester. In addition, 49% of the students in the cohort enrolled in at least one summer semester. Students were least likely to enroll in a learning community; however, the learning community program at Crafton did not start until the Spring 2007 semester.

Figure 5: CHC 2005-2006 First-Time College Students Six-Year Instructional Strategies Totals.



Results

Figures 6 – 25 illustrate the relationship between students who completed a milestone (i.e. any milestone, transfer, transfer prepared, transfer directed, and earned a degree or certificate) and those who did not complete a milestone by momentum point, assessment result, student service, and instructional strategy. As an illustration, Figure 6 shows that of the students who completed any milestone, 66% completed transfer level math; and of the students who did not complete any milestone, only 6% completed transfer level math. All of the statistically significant differences in Figures 6 - 25 are identified with green font.

Tables 1 – 5 illustrate the effect size, 95% confidence intervals, and p-values for students achieving a milestone by momentum point, assessment result, student service, and instructional strategy. For instance, students who competed any milestone were statistically significantly ($p < .001$) and substantially (ES = 1.61) more likely to

successfully completed transfer level math (66%) than students who did not complete any milestone (6%). All of the statistically significant differences in Tables 1 – 5 are identified with **bold font**.

Following each table is the CART Segmentation Model illustrating the predictor variables that predict each milestone. The results of each segmentation model are explained in sections entitled “Interpreting the Study….” The Exhaustive CHAID segmentation model growing method was used to identify possible proactive strategies that the college can implement in order to increase the likelihood that students will achieve a milestone for the statistically significant results identified in tables 1 – 5.

Achieving Any Milestone

Figure 6: CHC 2005-2006 First-Time College Students Six-Year Milestone Achievement Totals by Momentum Point.

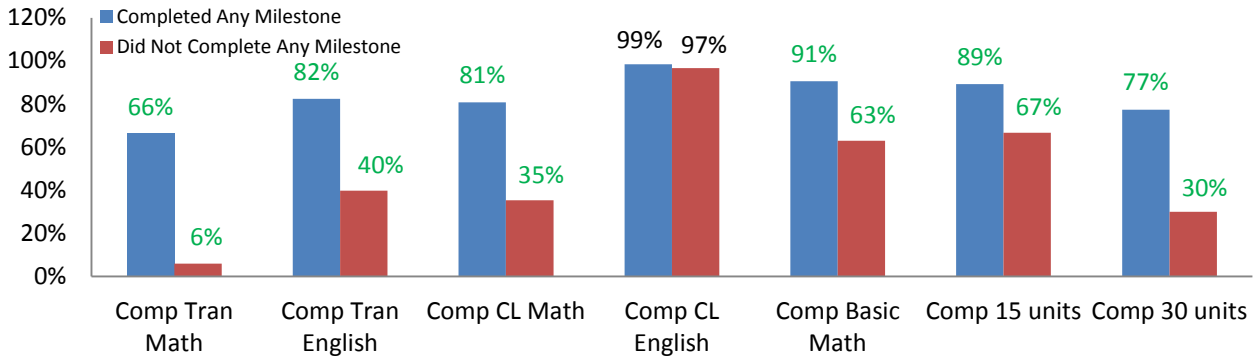


Figure 7: CHC 2005-2006 First-Time College Students Six-Year Milestone Achievement Totals by Student Assessment Results.

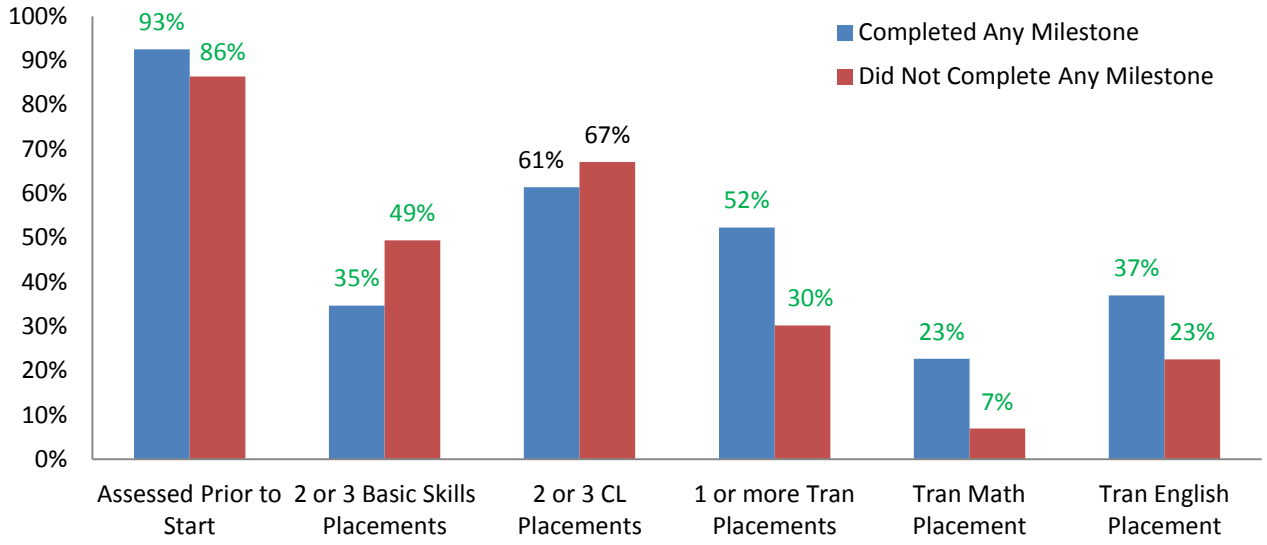
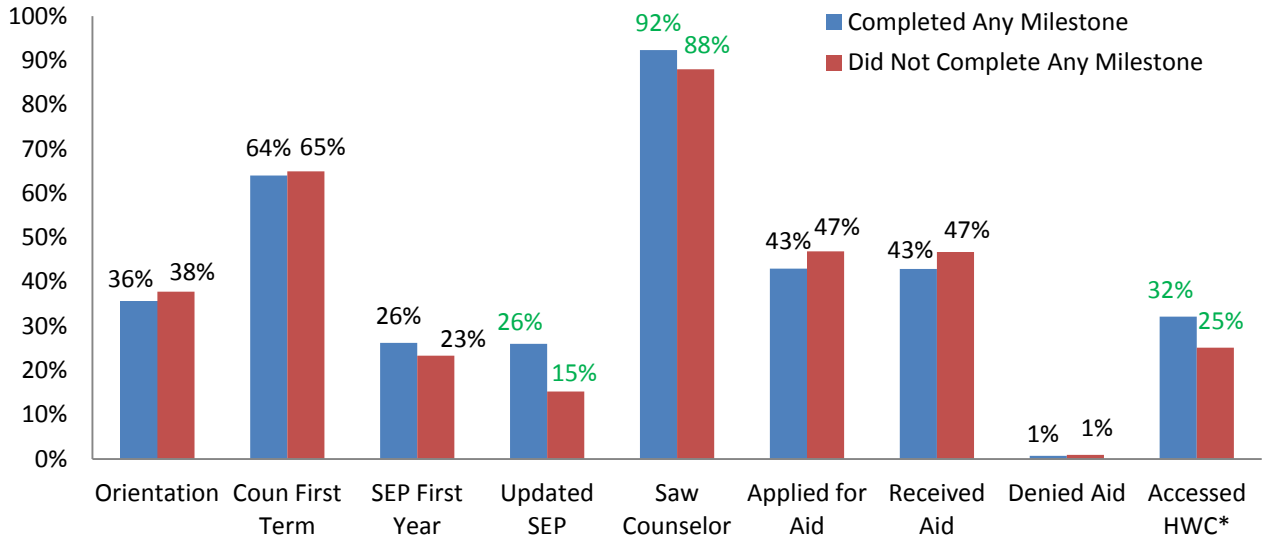


Figure 8: First-Time College CHC Students Six-Year Milestone Achievement Totals by Student Services Strategies.



*The relationship is stronger for non-occupational students (i.e. Students who did not successfully complete a clearly or advanced occupational course). Specifically, 23% of non-occupational students who accessed the HWC achieved a milestone; whereas, 16% of non-occupational students who did not access the HWC achieved a milestone (p = .059, ES = .18). Conversely, 40% of occupational students who accessed the HWC achieved a milestone; whereas, 44% of occupational students who did not access the HWC achieved a milestone (p = .486, ES = -.08). Accordingly, accessing the HWC is more likely to have a stronger positive relationship with occupational students than non-occupational students.

Figure 9: First-Time College CHC Students Six-Year Milestone Achievement Totals by Instructional Strategies.

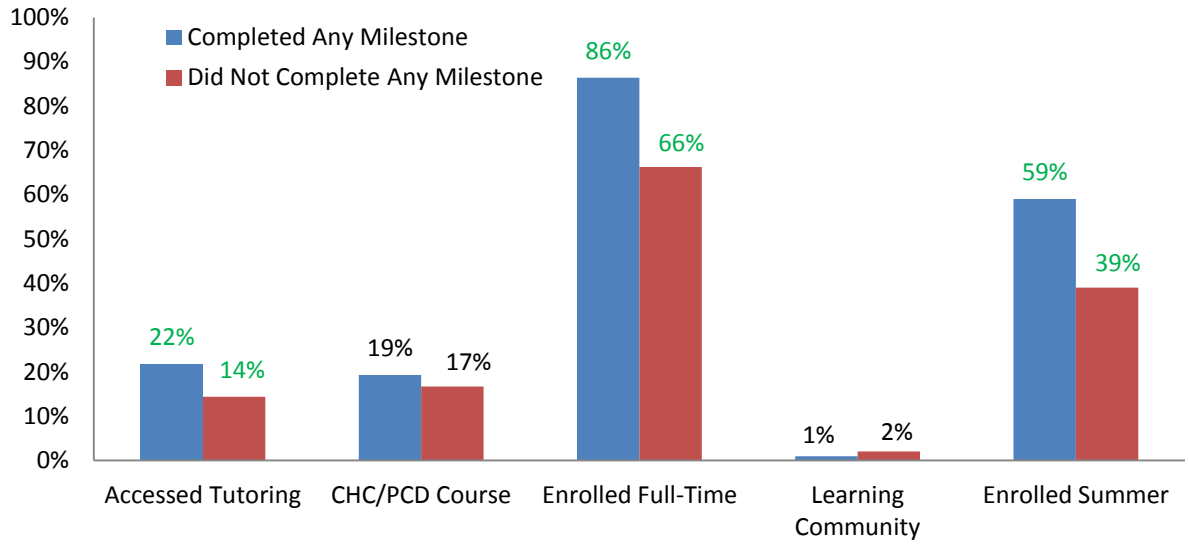


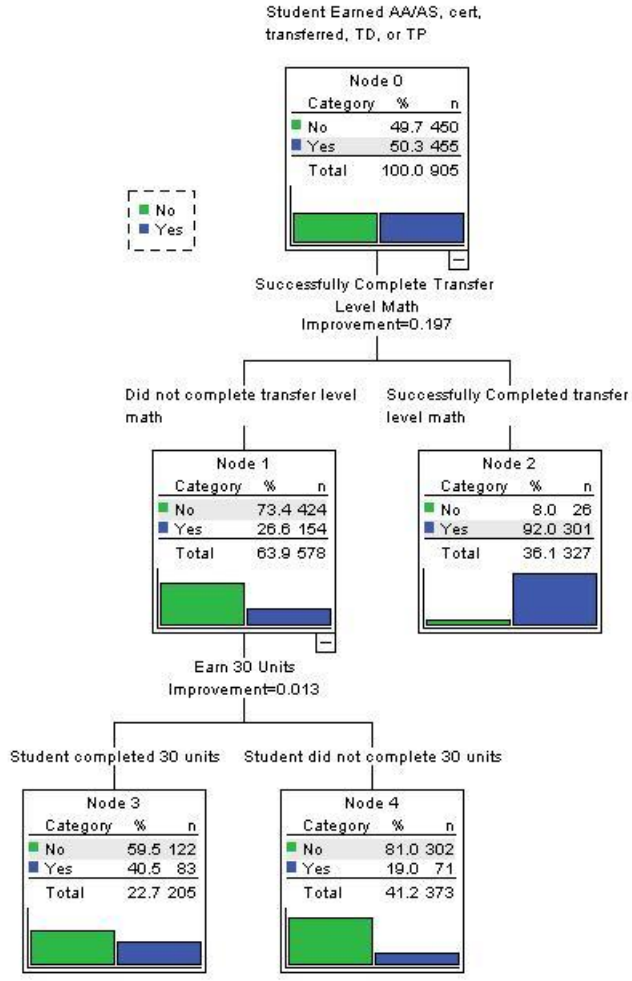
Table 1: Effect Size, 95% Confidence Intervals, and P-Values for Students Achieving Any Milestone by Momentum Point, Assessment Results, Student Service and Instructional Strategies.

	No			Yes			Effect Size & 95% CI Lower & Upper ES			P-Value
	#	N	%	#	N	%	ES	Lower	Upper	
Momentum Points										
Completed Tran Math	26	450	**5.8**	301	455	**66.2**	**1.61**	1.46	1.76	**< .001**
Completed Tran Engl	179	450	**39.8**	375	455	**82.4**	**0.97**	0.83	1.11	**< .001**
Completed CL Math	159	450	**35.3**	367	455	**80.7**	**1.03**	0.89	1.17	**< .001**
Completed CL Engl	435	450	96.7	448	455	98.5	0.12	-0.01	0.25	.080
Completed Basic Skills Math	283	450	**62.9**	412	455	**90.5**	**0.69**	0.56	0.83	**< .001**
Completed 15 Units	300	450	**66.7**	406	455	**89.2**	**0.57**	0.43	0.70	**< .001**
Completed 30 Units	135	450	**30.0**	352	455	**77.4**	**1.08**	0.94	1.22	**< .001**
Assessment										
Assessed Prior to First Start Date	389	450	**86.4**	421	455	**92.5**	**0.20**	0.07	0.33	**.003**
2 or 3 Basic Skills Placements	177	358	**49.4**	146	421	**34.7**	**-0.30**	-0.44	-0.16	**< .001**
2 or 3 CL Placements	100	149	67.1	154	251	61.4	-0.12	-0.32	0.08	.248
1 or More Tran Placements	133	440	**30.2**	237	453	**52.3**	**0.46**	0.33	0.59	**< .001**
Tran Math Placement	30	435	**6.9**	102	450	**22.7**	**0.45**	0.32	0.59	**< .001**
Tran Engl Placement	98	435	**22.5**	166	449	**37.0**	**0.32**	0.19	0.45	**< .001**
Student Service Strategies										
Orientation	170	450	37.8	162	455	35.6	-0.05	-0.18	0.09	.498
Counseling First Term	292	450	64.9	291	455	64.0	-0.02	-0.15	0.11	.770
SEP First Year	105	450	23.3	119	455	26.2	0.07	-0.07	0.20	.326
Updated SEP	16	105	**15.2**	31	119	**26.1**	**0.27**	0.00	0.53	**.048**
Saw Counselor	396	450	**88.0**	420	455	**92.3**	**0.14**	0.01	0.28	**.030**
Applied for Aid	211	450	46.9	196	455	43.1	-0.08	-0.21	0.05	.250
Received Aid	210	450	46.7	195	455	42.9	-0.08	-0.21	0.05	.250
Denied Aid	4	450	0.9	3	455	0.7	-0.03	-0.16	0.10	.694
Used HWC	113	450	**25.1**	146	455	**32.1**	**0.15**	0.02	0.29	**.020**
Instructional Strategies										
Tutoring Center	65	450	**14.4**	99	455	**21.8**	**0.19**	0.06	0.32	**.004**
CHC/PCD Course	75	450	16.7	88	455	19.3	0.07	-0.06	0.20	.296
Full-Time	298	450	**66.2**	393	455	**86.4**	**0.49**	0.35	0.62	**< .001**
Learning Community	9	450	2.0	4	455	0.9	-0.09	-0.22	0.04	.158
Summer	177	450	**39.3**	266	455	**58.5**	**0.39**	0.26	0.52	**< .001**

Study #1: Students who achieved Any Milestone (Student Progress and Achievement Rate, SPAR)

Study #1 examines students who achieved any milestone by either transferring to a four-year institution, becoming transfer prepared, becoming transfer directed, or earning a degree or certificate (coded as “1”) and students who did not achieve any milestone (coded as “0”).

CART Segmentation Model Showing the Predictors of Achieving any Milestone



***Risk Estimate = .199, SE of Risk Estimate = .013, Improvement set to .01, Child Node set to 5% of Total N, Parent Node is twice the Child Node.**

Interpreting the Study #1 Decision Tree

In examining the decision tree created for Study #1, Node 0 indicates that among the 905 students in the cohort, 50% achieved one of the SPAR milestones, while 50% did not achieve any of the SPAR milestones in a six year period. Examining the various demographic, momentum points, assessment results, student service and instructional strategies that were loaded into the Study #1 segmentation model as possible predictor variables, successfully completing transfer level math loaded as the primary predictor variable.

Unique to students who did not complete a transfer level math course, students who completed 30 or more units loaded as a secondary predictor variable. Among the 578 students who did not complete transfer level math, statistically significant differences in the percent of students who went on to achieve any milestone were observed between students who completed 30 units (41%) and students who did not complete 30 units (19%).

Identifying Possible Proactive Strategies

Table 1 identified possible momentum points, student service, and instructional strategies that were statistically significantly related to achieving any milestone. Each of these strategies represents possible proactive strategies that the college can implement in order to increase the likelihood that students will achieve a milestone. Accordingly, an Exhaustive CHAID segmentation model was generated for each statistically significant result with either the number of years it took the student to reach the momentum point or the number of times a student engaged in the behavior.

The results of the Exhaustive CHAID segmentation models are summarized below. Each bullet represents a separate category of students. As an illustration, 446 students completed their transfer level English course within two years, and of those 446 students, 72% or 319 achieved a milestone. In addition, 107 successfully completed transfer level English within 3 to 5.5 years, and of those 107, 52% or 56 achieved a

milestone. Finally, 352 students completed transfer level English in six years or not at all, and of those 352, 23% or 80 achieved a milestone.

Momentum Points

- Number of Years to Complete Transfer Level Math and Achieve any Milestone
  - 92% of students who successfully complete **transfer level math within six years** achieve a milestone
  - 27% of students who did not successfully complete transfer level math within six years achieved a milestone
- Number of Years to Complete Transfer Level English and Achieve any Milestone
  - 72% of students who successfully complete **transfer level English within two years** achieve a milestone
  - 52% of students who successfully complete transfer level English from 3 to 5.5 years achieve a milestone
  - 23% of students who successfully complete transfer level English in six years or not at all achieve a milestone
- Number of Years to Complete College Level Math and Achieve any Milestone
  - 79% of students who successfully complete **college level math within one year** achieve a milestone
  - 64% of students who successfully complete college level math from 2 to 6 years achieve a milestone
  - 55% of students who placed into college level math or higher achieve a milestone
  - 23% of students who do not successfully complete college level math within six years achieve a milestone
- Number of Years to Complete Basic Skills Math and Achieve any Milestone
  - 60% of students who successfully complete **basic skills math within four years** achieve a milestone
  - 22% of students who successfully completed basic skills math from 5 to 6 years or not at all achieve a milestone

- Number of Terms to Earn 15 Units and Achieve a Milestone
  - 84% of students who **earn 15 units in their first term** achieve a milestone
  - 60% of students who earn 15 units in 1 to 1.5 years achieve a milestone
  - 37% of students who earn 15 units from 2 to 6 years achieve a milestone
  - 25% of students who do not earn 15 units achieve a milestone
- Number of Terms to Earn 30 Units and Achieve a Milestone
  - 83% of students who **earn 30 units in their first two years** achieve a milestone
  - 57% of students who earn 30 units from 3 to 4 years achieve a milestone
  - 25% of students who earn 30 units from 5 to 6 years or not at all achieve a milestone

Student Service Strategies

- Number of Times Student Met with a Counselor and Achieve a Milestone
  - 59% of students who **met with a counselor 6 or more times** achieve a milestone
  - 42% of students who did not meet with a counselor or met with a counselor 1 – 5 times achieve a milestone

Instructional Strategies

- Number of Times Students Visited the Tutoring Center and Achieve a Milestone
  - 60% of students who **visited the Tutoring Center 1 or more times** achieve a milestone
  - 48% of students who did not visit the Tutoring Center achieve a milestone

- Number of Times Students Enrolled Full-Time and Achieve a Milestone
  - 89% of students who **enrolled full-time in 5 or more semesters** achieved a milestone
  - 66% of students who enrolled full-time in 3 to 4 semesters achieved a milestone
  - 43% of students who enrolled full-time in 2 semesters achieved a milestone
  - 31% of students who enrolled full-time in none or 1 semester achieved a milestone
- Number of Times Students Enrolled in a Summer Semester and Achieve a Milestone
  - 73% of students who **enrolled in 2 or more summer semesters** achieved a milestone
  - 52% of students who enrolled in 1 summer semester achieved a milestone
  - 41% of students who did not enroll in a summer semester achieved a milestone

Transferring to a Four-Year Institution

Figure 10: CHC 2005-2006 First-Time College Students Six-Year Transfer Totals by Momentum Point.

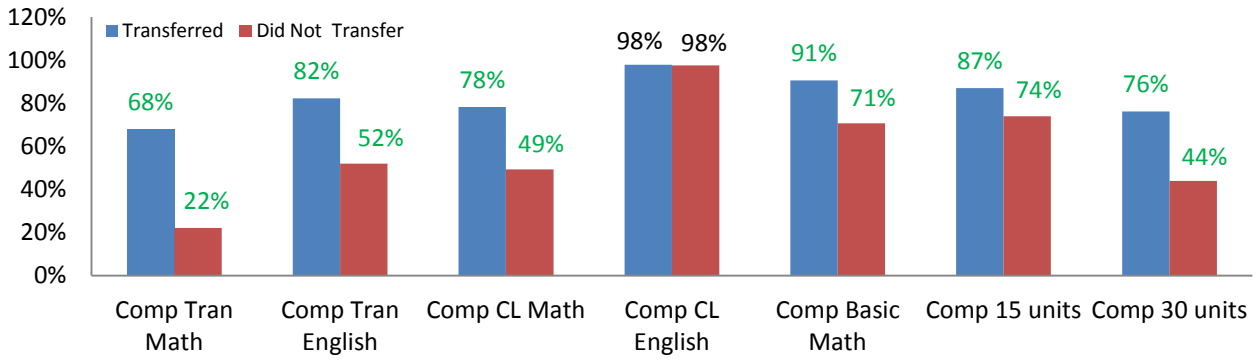


Figure 11: CHC 2005-2006 First-Time College Students Six-Year Transfer Totals by Student Assessment Results.

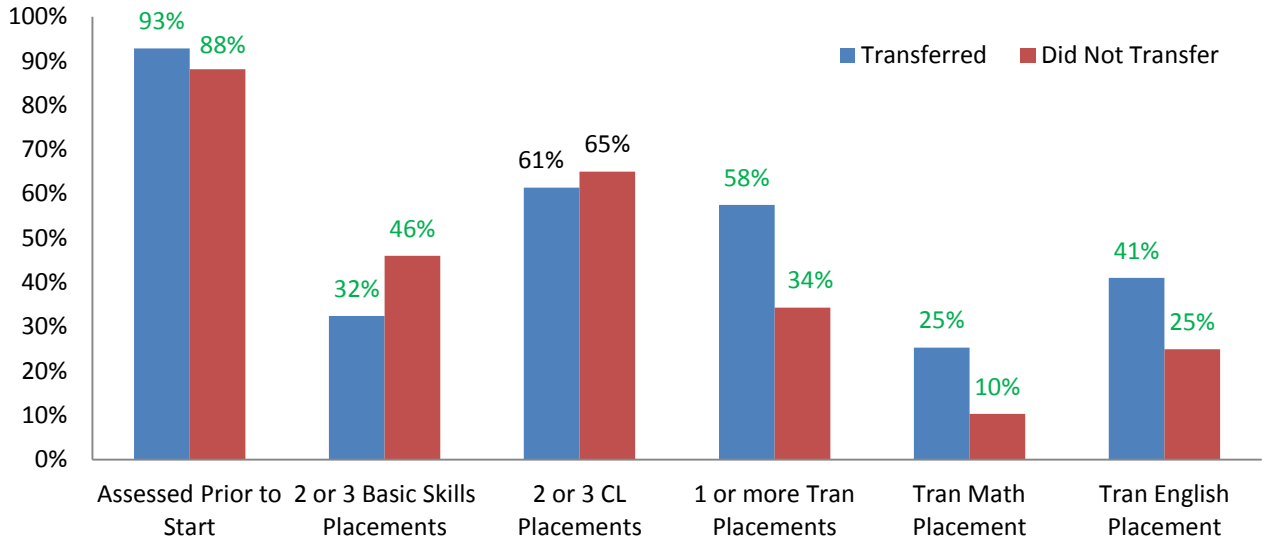


Figure 12: First-Time College CHC Students Six-Year Transfer Totals by Student Services Strategies.

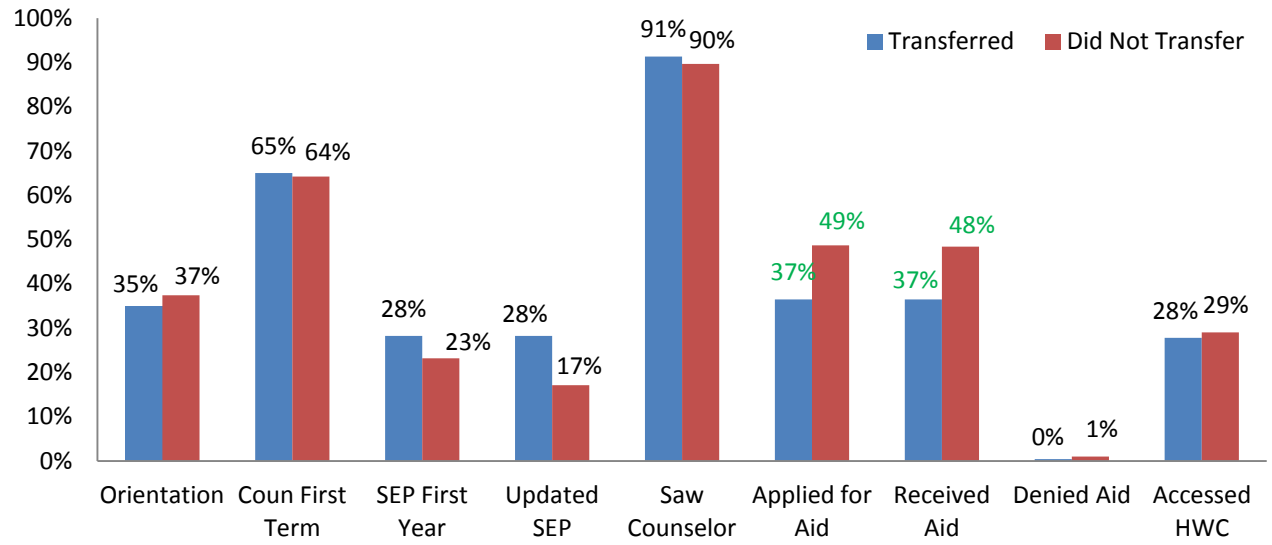


Figure 13: CHC First-Time College Students Six-Year Transfer Totals by Instructional Strategies.

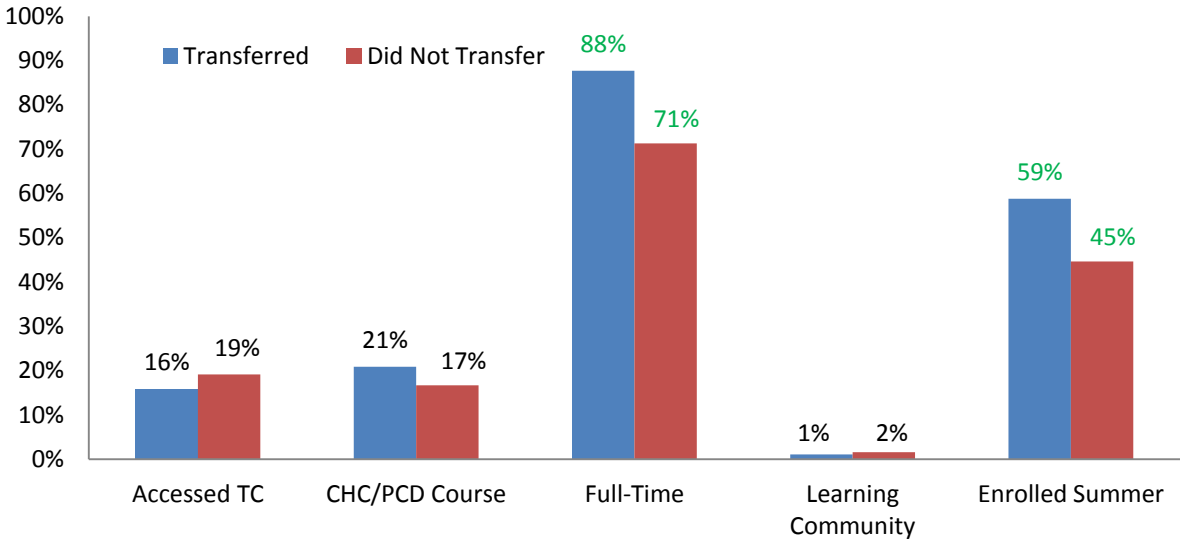


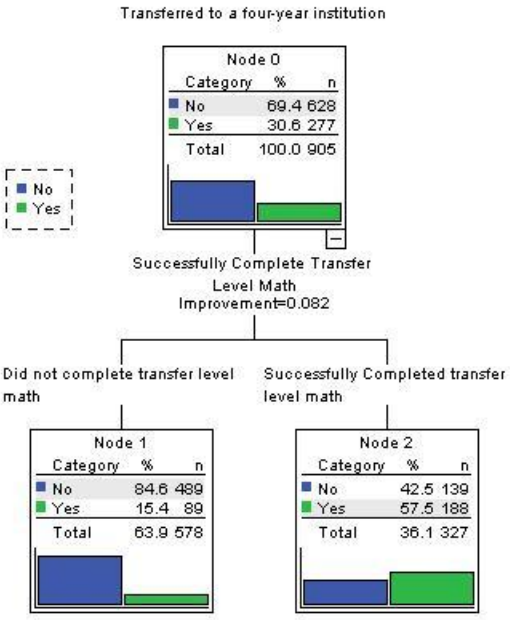
Table 2: Effect Size, 95% Confidence Intervals, and P-Values for Students Transferring to a Four-Year Institution by Momentum Point, Assessment Results, Student Service and Instructional Strategies.

	No			Yes			Effect Size & 95% CI Lower & Upper ES			P-Value
	#	N	%	#	N	%	ES	Lower	Upper	
Momentum Points										
Completed Tran Math	139	628	**22.1**	188	277	**67.9**	**1.06**	0.91	1.21	**< .001**
Completed Tran Engl	326	628	**51.9**	228	277	**82.3**	**0.65**	0.51	0.79	**< .001**
Completed CL Math	309	628	**49.2**	217	277	**78.3**	**0.61**	0.47	0.76	**< .001**
Completed CL Engl	612	628	97.5	271	277	97.8	0.02	-0.12	0.17	.731
Completed Basic Skills Math	444	628	**70.7**	251	277	**90.6**	**0.48**	0.34	0.63	**< .001**
Completed 15 Units	465	628	**74.0**	241	277	**87.0**	**0.32**	0.17	0.46	**< .001**
Completed 30 Units	276	628	**43.9**	211	277	**76.2**	**0.68**	0.53	0.82	**< .001**
Assessment										
Assessed Prior to First Start Date	553	628	**88.1**	257	277	**92.8**	**0.15**	0.01	0.30	**.033**
2 or 3 Basic Skills Placements	239	520	**46.0**	84	259	**32.4**	**-0.28**	-0.43	-0.13	**< .001**
2 or 3 CL Placements	152	234	65.0	102	166	61.4	-0.07	-0.27	0.13	.475
1 or More Tran Placements	212	618	**34.3**	158	275	**57.5**	**0.48**	0.34	0.62	**< .001**
Tran Math Placement	63	612	**10.3**	69	273	**25.3**	**0.43**	0.28	0.57	**< .001**
Tran Engl Placement	152	611	**24.9**	112	273	**41.0**	**0.36**	0.21	0.50	**< .001**
Student Service Strategies										
Orientation	235	628	37.4	97	277	35.0	-0.05	-0.19	0.09	.490
Counseling First Term	403	628	64.2	180	277	65.0	0.02	-0.12	0.16	.815
SEP First Year	146	628	23.2	78	277	28.2	0.11	-0.03	0.26	.124
Updated SEP	25	146	17.1	22	78	28.2	0.27	0.00	0.55	.067
Saw Counselor	563	628	89.6	253	277	91.3	0.06	-0.08	0.20	.433
Applied for Aid	306	628	**48.7**	101	277	**36.5**	**-0.25**	-0.39	-0.11	**.001**
Received Aid	304	628	**48.4**	101	277	**36.5**	**-0.24**	-0.38	-0.10	**.001**
Denied Aid	6	628	1.0	1	277	0.4	-0.07	-0.21	0.07	.347
Used HWC	182	628	29.0	77	277	27.8	-0.03	-0.17	0.12	.717
Instructional Strategies										
Tutoring Center	120	628	19.1	44	277	15.9	-0.08	-0.23	0.06	.246
CHC/PCD Course	105	628	16.7	58	277	20.9	0.11	-0.03	0.25	.142
Full-Time	448	628	**71.3**	243	277	**87.7**	**0.39**	0.25	0.53	**< .001**
Learning Community	10	628	1.6	3	277	1.1	-0.04	-0.18	0.10	.553
Summer	280	628	**44.6**	163	277	**58.8**	**0.29**	0.15	0.43	**< .001**

Study #2: Students who Transferred to a Four-Year Institution

Study #2 examines students who transferred to a four-year institution (coded as “1”) and students who did not transfer to a four-year institution (coded as “0”).

CART Segmentation Model Showing the Predictors of Transferring to a Four-Year Institution



***Risk Estimate = .252, SE of Risk Estimate = .014, Improvement set to .01, Child Node set to 5% of Total N, Parent Node is twice the Child Node.**

Interpreting the Study #2 Decision Tree

In examining the decision tree created for Study #2, Node 0 indicates that among the 905 students in the cohort, 31% transferred to a four-year institution, while 69% did not transfer to a four-year institution in a six year period. Examining the various demographic, momentum points, assessment results, student service and instructional strategies that were loaded into the Study #2 segmentation model as possible predictor variables, successfully completing transfer level math loaded as the primary and only predictor variable.

Identifying Possible Proactive Strategies

Table 2 identified possible momentum points, student service, and instructional strategies that were statistically significantly related to achieving any milestone. Each of these strategies represents possible proactive strategies that the college can implement in order to increase the likelihood that students will transfer to a four-year institution. Accordingly, an Exhaustive CHAID segmentation model was generated for each statistically significant result with either the number of years it took the student to reach the momentum point or the number of times a student engaged in the behavior.

The results of the Exhaustive CHAID segmentation models are summarized below. Each bullet represents a separate category of students. As an illustration, 314 students completed a transfer level math course within five years, and of those 314 students, 60% or 187 transferred. In addition, 591 successfully completed transfer level math within 6 years or did not successfully complete transfer level math, and of those 591, 15% or 90 transferred to a four-year institution.

Momentum Points

- Number of Years to Complete Transfer Level Math and Transfer to a Four-Year Institution
    - 60% of students who successfully complete **transfer level math within five years** transfer to a four-year institution

    - 15% of students who successfully complete transfer level math within six years or who do not complete transfer level math transfer to a four-year institution
- Number of Years to Complete Transfer Level English and Transfer
    - 48% of students who successfully complete **transfer level English within two years** transferred to a four-year institution
    - 14% of students who successfully complete transfer level English from 3 to 6 years or not at all transferred to a four-year institution
- Number of Years to Complete College Level Math and Transfer
    - 45% of students who successfully complete **college level math within 2.5 years** transferred to a four-year institution
    - 16% of students who successfully completed college level math within 3 to 6 years or who did not successfully complete college level math within six years transferred to a four-year institution
- Number of Years to Complete Basic Skills Math and Transfer
    - 38% of students who successfully complete **basic skills math within 3.5 years** transferred to a four-year institution
    - 13% of students who successfully completed basic skills math from 4 to 6 years or not at all transferred to a four-year institution
- Number of Terms to Earn 15 Units and Transfer
    - 60% of students who **earn 15 units in their first term** transferred to a four-year institution
    - 36% of students who earn 15 units in 1 to 1.5 years transferred to a four-year institution
    - 17% of students who earn 15 units from 2 to 6 years or not at all transferred to a four-year institution
- Number of Terms to Earn 30 Units and Transfer
    - 56% of students who **earn 30 units in their first two years** transferred to a four-year institution
    - 16% of students who earn 30 units from 3 to 6 years or not at all transferred to a four-year institution

Instructional Strategies

- Number of Times Students Enrolled Full-Time and Transfer
  - 54% of students who **enrolled full-time in 4 or more semesters** transferred to a four-year institution
  - 31% of students who enrolled full-time in 3 semesters transferred to a four-year institution
  - 20% of students who enrolled full-time in 2 or less semesters transferred to a four-year institution
- Number of Times Students Enrolled in a Summer Semester and Transfer
  - 46% of students who **enrolled in 2 or more summer semesters** transferred to a four-year institution
  - 27% of students who enrolled in 1 summer semester or less transferred to a four-year institution

Transfer Prepared

Figure 14: CHC 2005-2006 First-Time College Students Six-Year Transfer Prepared Totals by Momentum Point.

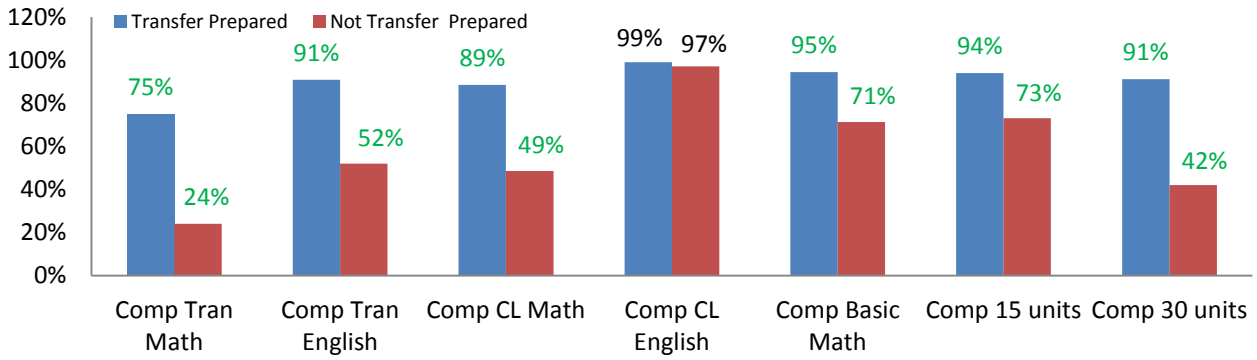


Figure 15: CHC 2005-2006 First-Time College Students Six-Year Transfer Prepared Totals by Student Assessment Results.

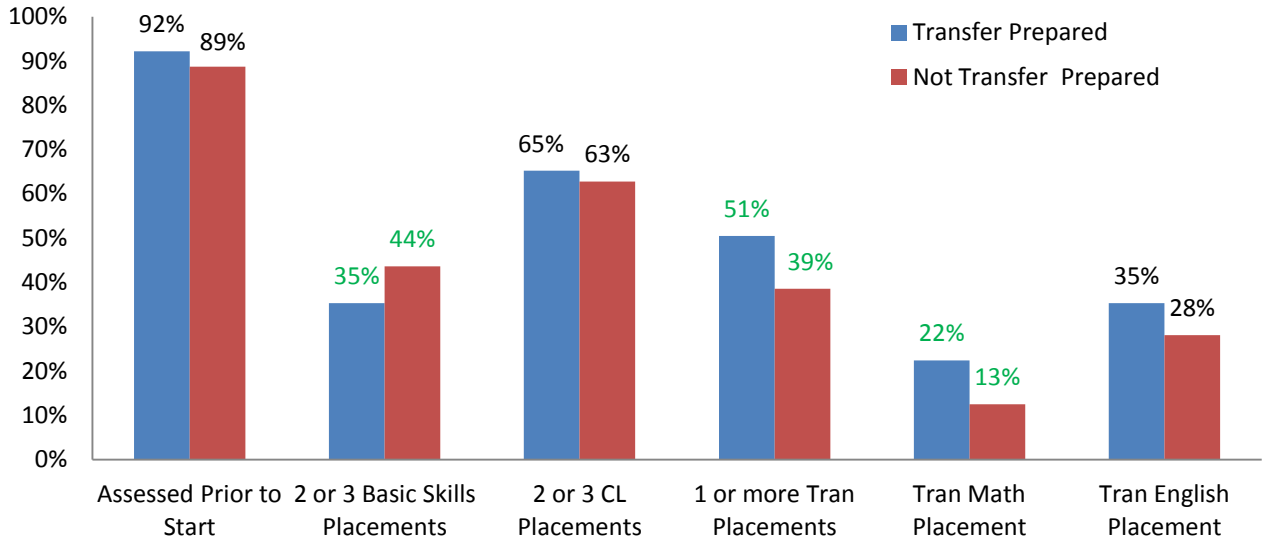
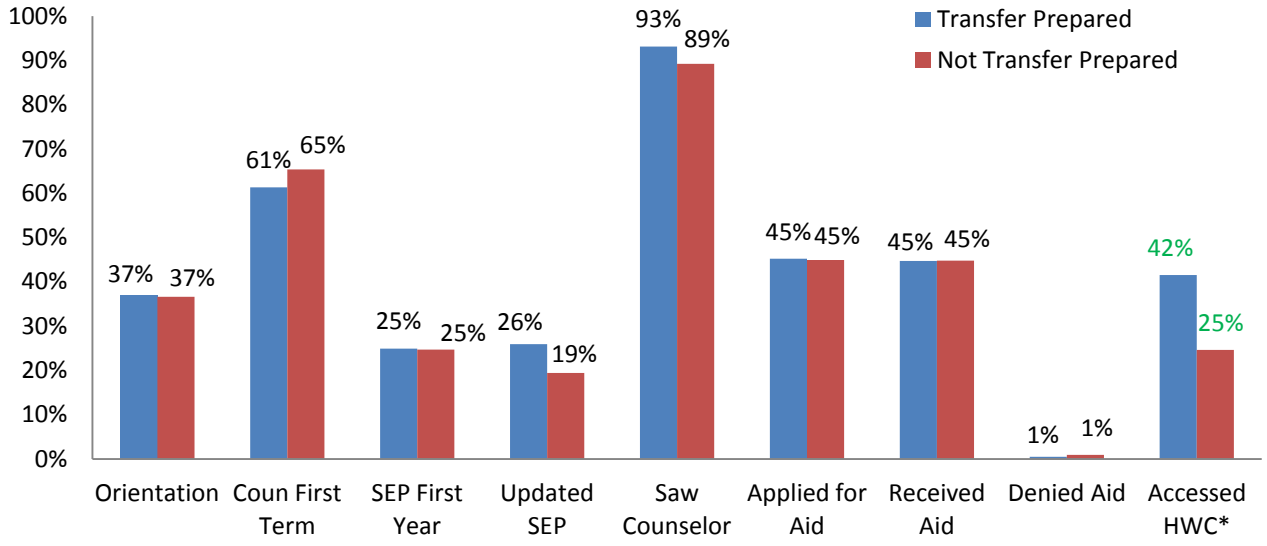


Figure 16: First-Time College CHC Students Six-Year Transfer Prepared Totals by Student Services Strategies.



*The relationship is stronger for non-occupational students (i.e. Students who did not successfully complete a clearly or advanced occupational course). Specifically, 32% of non-occupational students who accessed the HWC were transfer prepared; whereas, 16% of non-occupational students who did not access the HWC were transfer prepared (p = .005, ES = .42). Conversely, 46% of occupational students who accessed the HWC were transfer prepared; whereas, 39% of occupational students who did not access the HWC were transfer prepared (p = .160, ES = .15). Accordingly, when non-occupational students access the HWC they are statistically significantly and substantially more likely to be transfer prepared.

Figure 17: First-Time College CHC Students Six-Year Transfer Prepared Totals by Instructional Strategies.

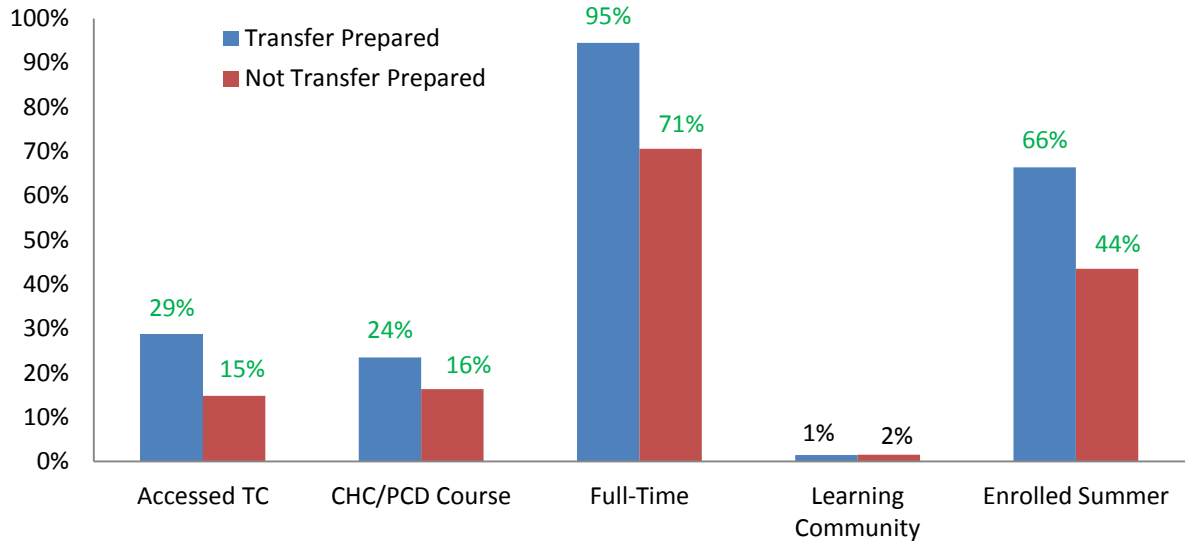


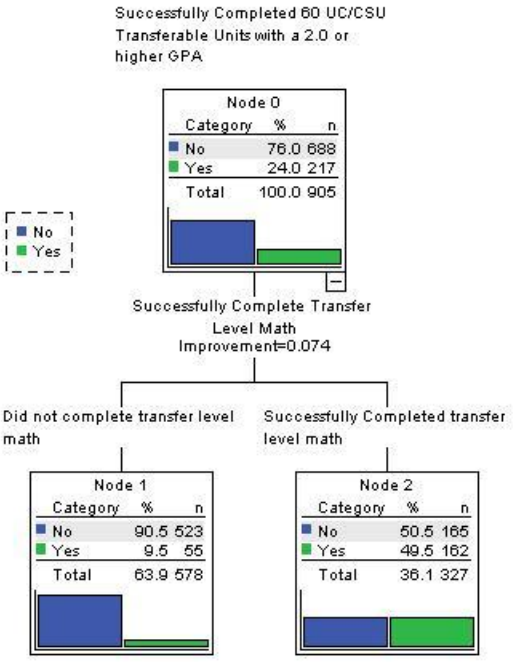
Table 3: Effect Size, 95% Confidence Intervals, and P-Values for Students who are Transfer Prepared by Momentum Point, Assessment Results, Student Service and Instructional Strategies.

	No			Yes			Effect Size & 95% CI Lower & Upper ES			P-Value
	#	N	%	#	N	%	ES	Lower	Upper	
Momentum Points										
Completed Tran Math	165	688	**24.0**	162	217	**74.7**	**1.18**	1.02	1.34	**< .001**
Completed Tran Engl	357	688	**51.9**	197	217	**90.8**	**0.85**	0.69	1.00	**< .001**
Completed CL Math	334	688	**48.5**	192	217	**88.5**	**0.86**	0.70	1.02	**< .001**
Completed CL Engl	668	688	97.1	215	217	99.1	0.13	-0.02	0.28	.098
Completed Basic Skills Math	490	688	**71.2**	205	217	**94.5**	**0.57**	0.41	0.72	**< .001**
Completed 15 Units	502	688	**73.0**	204	217	**94.0**	**0.52**	0.36	0.67	**< .001**
Completed 30 Units	289	688	**42.0**	198	217	**91.2**	**1.09**	0.93	1.25	**< .001**
Assessment										
Assessed Prior to First Start Date	610	688	88.7	200	217	92.2	0.11	-0.04	0.27	.142
2 or 3 Basic Skills Placements	252	578	**43.6**	71	201	**35.3**	**-0.17**	-0.33	-0.01	**.040**
2 or 3 CL Placements	179	285	62.8	75	115	65.2	0.05	-0.17	0.27	.651
1 or More Tran Placements	261	677	**38.6**	109	216	**50.5**	**0.24**	0.09	0.40	**.002**
Tran Math Placement	84	671	**12.5**	48	214	**22.4**	**0.28**	0.13	0.43	**.002**
Tran Engl Placement	188	669	28.1	76	215	35.3	0.16	0.00	0.31	.051
Student Service Strategies										
Orientation	252	688	36.6	80	217	36.9	0.00	-0.15	0.16	.949
Counseling First Term	450	688	65.4	133	217	61.3	-0.09	-0.24	0.07	.277
SEP First Year	170	688	24.7	54	217	24.9	0.00	-0.15	0.16	.958
Updated SEP	33	170	19.4	14	54	25.9	0.16	-0.15	0.47	.308
Saw Counselor	614	688	89.2	202	217	93.1	0.13	-0.02	0.28	.098
Applied for Aid	309	688	44.9	98	217	45.2	0.00	-0.15	0.16	.949
Received Aid	308	688	44.8	97	217	44.7	0.00	-0.15	0.15	.986
Denied Aid	6	688	0.9	1	217	0.5	-0.05	-0.20	0.11	.547
Used HWC	169	688	**24.6**	90	217	**41.5**	**0.38**	0.22	0.53	**< .001**
Instructional Strategies										
Tutoring Center	102	688	**14.8**	62	217	**28.6**	**0.36**	0.21	0.51	**< .001**
CHC/PCD Course	112	688	**16.3**	51	217	**23.5**	**0.19**	0.04	0.34	**.025**
Full-Time	486	688	**70.6**	205	217	**94.5**	**0.58**	0.42	0.73	**< .001**
Learning Community	10	688	1.5	3	217	1.4	-0.01	-0.16	0.15	.939
Summer	299	688	**43.5**	144	217	**66.4**	**0.47**	0.31	0.62	**< .001**

Study #3: Students who were Transfer Prepared

Study #3 examines students who became transfer prepared within six years (coded as "1") and students who did not become transfer prepared within six years (coded as "0").

CART Segmentation Model Showing the Predictors of being Transfer Prepared



***Risk Estimate = .240, SE of Risk Estimate = .014, Improvement set to .01, Child Node set to 5% of Total N, Parent Node is twice the Child Node.**

Interpreting the Study #3 Decision Tree

In examining the decision tree created for Study #3, Node 0 indicates that among the 905 students in the cohort, 24% were transfer prepared, while 76% were not transfer prepared in a six year period. Examining the various demographic, momentum points, assessment results, student service and instructional strategies that were loaded into the Study #3 segmentation model as possible predictor variables, successfully completing transfer level math loaded as the primary and only predictor variable.

Identifying Possible Proactive Strategies

Table 3 identified possible momentum points, student service, and instructional strategies that were statistically significantly related to achieving any milestone. Each of these strategies represents possible proactive strategies that the college can implement in order to increase the likelihood that students will transfer to a four-year institution. Accordingly, an Exhaustive CHAID segmentation model was generated for each statistically significant result with either the number of years it took the student to reach the momentum point or the number of times a student engaged in the behavior.

The results of the Exhaustive CHAID segmentation models are summarized below. Each bullet represents a separate category of students. As an illustration, 296 students completed a transfer level math course within 4 years, and of those 296 students, 53% or 156 were transfer prepared. In addition, 609 successfully completed transfer level math from 5 to 6 years or did not successfully complete transfer level math, and of those 609, 10% or 61 were transfer prepared.

Momentum Points

- Number of Years to Complete Transfer Level Math and be Transfer Prepared
  - 53% of students who successfully complete **transfer level math within four years** become transfer prepared
  - 10% of students who successfully complete transfer level math within 5 to 6 years or not at all become transfer prepared

- Number of Years to Complete Transfer Level English and be Transfer Prepared
  - 39% of students who successfully complete **transfer level English within two years** become transfer prepared
  - 23% of students who successfully complete transfer level English from 2.5 to 5 years become transfer prepared
  - 6% of students who successfully complete transfer level English in six years or not all become transfer prepared
- Number of Years to Complete College Level Math and be Transfer Prepared
  - 40% of students who successfully complete **college level math within 3 years** become transfer prepared
  - 24% of students who successfully completed college level math within 4 to 6 years become transfer prepared
  - 20% of students who placed into college level math or higher become transfer prepared
  - 7% of students who do not complete college level math become transfer prepared
- Number of Years to Complete Basic Skills Math and be Transfer Prepared
  - 34% of students who successfully complete **basic skills math within 6 years** become transfer prepared
  - 27% of students who place into college level or transfer level math become transfer prepared
  - 6% of students who do not complete basic skills math become transfer prepared
- Number of Terms to Earn 15 Units and be Transfer Prepared
  - 47% of students who **earn 15 units in their first term** become transfer prepared
  - 32% of students who earn 15 units in 1 to 1.5 years become transfer prepared
  - 8% of students who earn 15 units from 2 to 6 years or not at all become transfer prepared

- Number of Terms to Earn 30 Units and be Transfer Prepared
  - 48% of students who **earn 30 units in within 2.5 years** become transfer prepared
  - 28% of students who earn 30 units in 3 to 4 years become transfer prepared
  - 5% of students who earn 30 units from 5 to 6 years or not at all become transfer prepared

Instructional Strategies

- Number of Times Students Enrolled Full-Time and be Transfer Prepared
  - 54% of students who **enrolled full-time in 4 or more semesters** transferred to a four-year institution
  - 31% of students who enrolled full-time in 3 semesters transferred to a four-year institution
  - 20% of students who enrolled full-time in 2 or less semesters transferred to a four-year institution
- Number of Times Students Enrolled in a Summer Semester and be Transfer Prepared
  - 46% of students who **enrolled in 2 or more summer semesters** transferred to a four-year institution
  - 27% of students who enrolled in 1 summer semester or less transferred to a four-year institution

Transfer Directed

Figure 18: CHC 2005-2006 First-Time College Students Six-Year Transfer Directed Totals by Momentum Point.

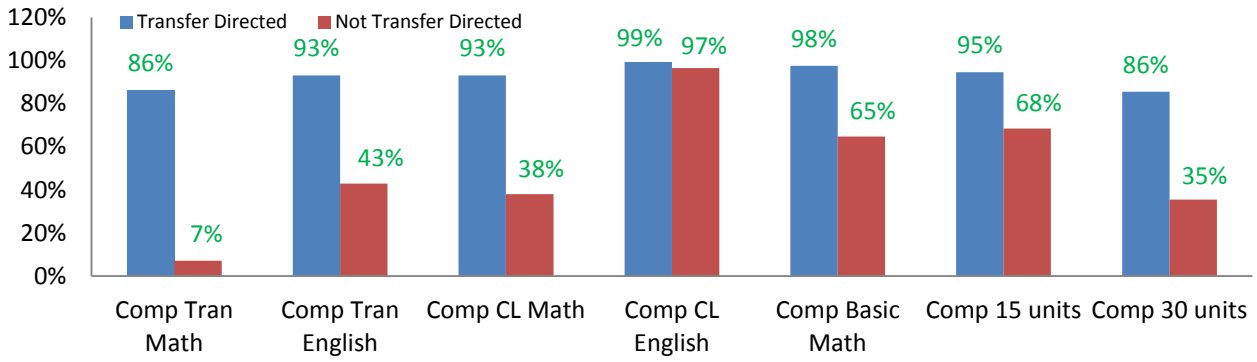


Figure 19: CHC 2005-2006 First-Time College Students Six-Year Transfer Directed Totals by Student Assessment Results.

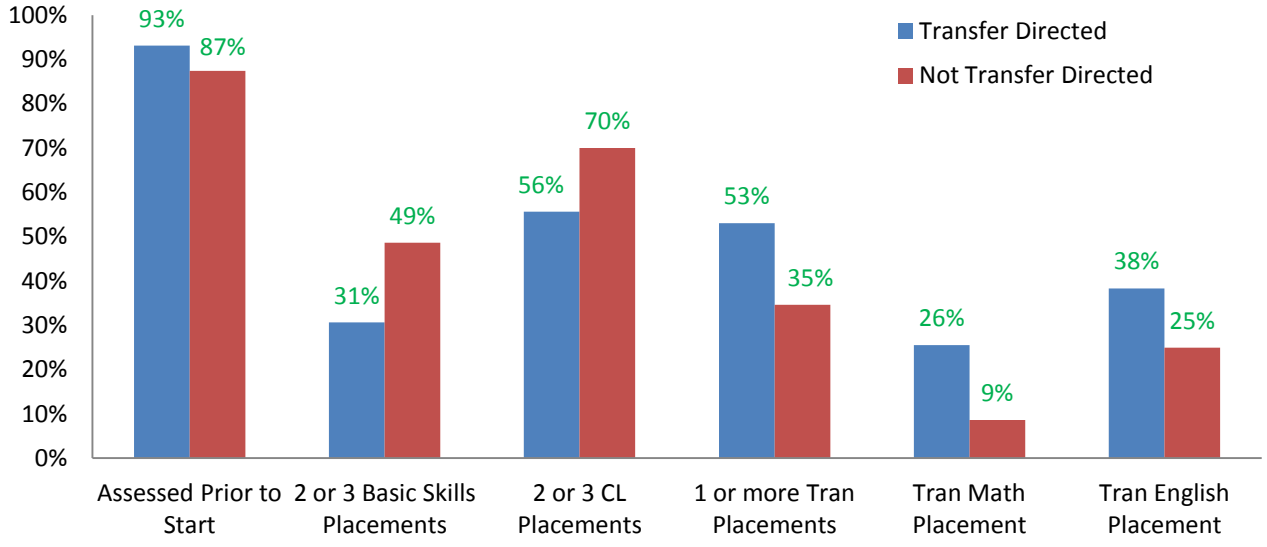


Figure 20: First-Time College CHC Students Six-Year Transfer Directed Totals by Student Services Strategies.

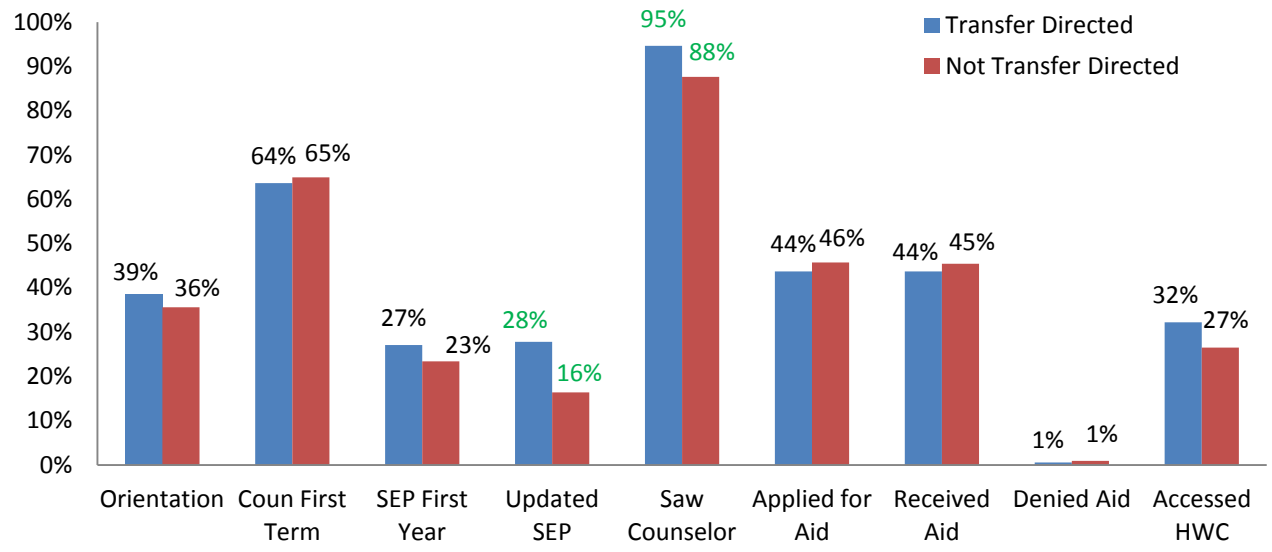


Figure 21: First-Time College CHC Students Six-Year Transfer Directed Totals by Instructional Strategies.

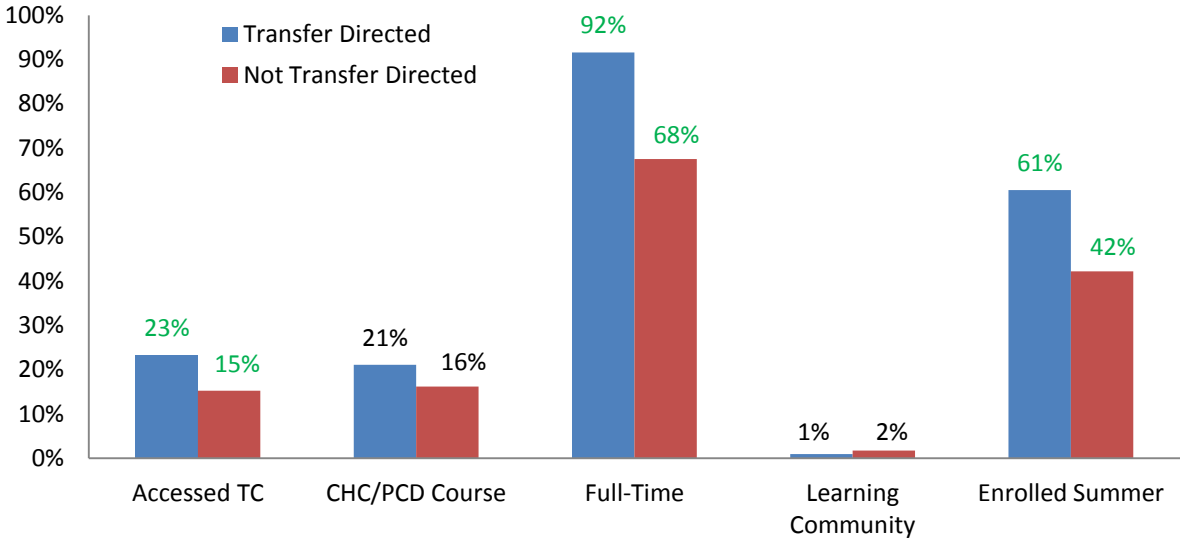


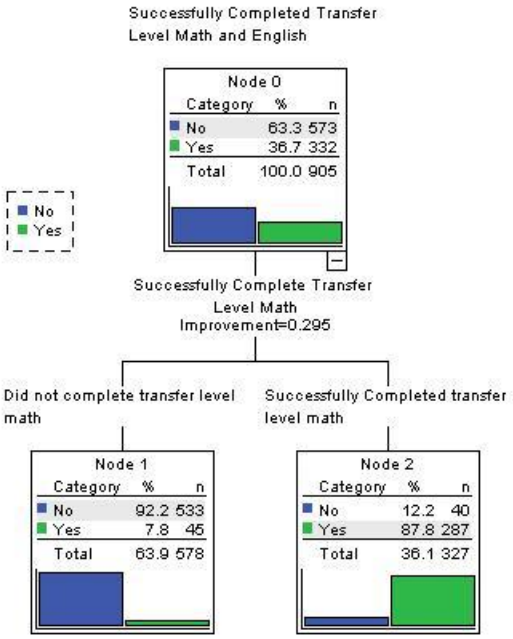
Table 4: Effect Size, 95% Confidence Intervals, and P-Values for Students who are Transfer Directed by Momentum Point, Assessment Results, Student Service and Instructional Strategies.

	No			Yes			Effect Size & 95% CI Lower & Upper ES			P-Value
	#	N	%	#	N	%	ES	Lower	Upper	
Momentum Points										
Completed Tran Math	40	573	**7.0**	287	332	**86.4**	**2.74**	2.55	2.92	**< .001**
Completed Tran Engl	245	573	**42.8**	309	332	**93.1**	**1.19**	1.04	1.33	**< .001**
Completed CL Math	217	573	**37.9**	309	332	**93.1**	**1.33**	1.18	1.47	**< .001**
Completed CL Engl	553	573	**96.5**	330	332	**99.4**	**0.19**	0.05	0.32	**.007**
Completed Basic Skills Math	371	573	**64.7**	324	332	**97.6**	**0.84**	0.70	0.98	**< .001**
Completed 15 Units	392	573	**68.4**	314	332	**94.6**	**0.66**	0.52	0.80	**< .001**
Completed 30 Units	203	573	**35.4**	284	332	**85.5**	**1.15**	1.00	1.29	**< .001**
Assessment										
Assessed Prior to First Start Date	501	573	**87.4**	309	332	**93.1**	**0.18**	0.05	0.32	**.008**
2 or 3 Basic Skills Placements	228	469	**48.6**	95	310	**30.6**	**-0.37**	-0.51	-0.23	**< .001**
2 or 3 CL Placements	154	220	**70.0**	100	180	**55.6**	**-0.30**	-0.50	-0.10	**.003**
1 or More Tran Placements	195	563	**34.6**	175	330	**53.0**	**0.38**	0.24	0.52	**< .001**
Tran Math Placement	48	556	**8.6**	84	329	**25.5**	**0.49**	0.35	0.62	**< .001**
Tran Engl Placement	138	555	**24.9**	126	329	**38.3**	**0.30**	0.16	0.43	**< .001**
Student Service Strategies										
Orientation	204	573	35.6	128	332	38.6	0.06	-0.07	0.20	.375
Counseling First Term	372	573	64.9	211	332	63.6	-0.03	-0.16	0.11	.679
SEP First Year	134	573	23.4	90	332	27.1	0.09	-0.05	0.22	.218
Updated SEP	22	134	**16.4**	25	90	**27.8**	**0.28**	0.01	0.55	**.049**
Saw Counselor	502	573	**87.6**	314	332	**94.6**	**0.24**	0.10	0.37	**.001**
Applied for Aid	262	573	45.7	145	332	43.7	-0.04	-0.18	0.09	.551
Received Aid	260	573	45.4	145	332	43.7	-0.03	-0.17	0.10	.620
Denied Aid	5	573	0.9	2	332	0.6	-0.03	-0.17	0.10	.655
Used HWC	152	573	26.5	107	332	32.2	0.13	-0.01	0.26	.072
Instructional Strategies										
Tutoring Center	87	573	**15.2**	77	332	**23.2**	**0.21**	0.07	0.34	**.004**
CHC/PCD Course	93	573	16.2	70	332	21.1	0.13	-0.01	0.26	.075
Full-Time	387	573	**67.5**	304	332	**91.6**	**0.59**	0.45	0.72	**< .001**
Learning Community	10	573	1.7	3	332	0.9	-0.07	-0.21	0.06	.306
Summer	242	573	**42.2**	201	332	**60.5**	**0.37**	0.24	0.51	**< .001**

Study #4: Students who were Transfer Directed

Study #4 examines students who became transfer directed within six years (coded as "1") and students who did not become transfer directed in six years (coded as "0").

CART Segmentation Model Showing the Predictors of becoming Transfer Directed



***Risk Estimate = .094, SE of Risk Estimate = .010, Improvement set to .01, Child Node set to 5% of Total N, Parent Node is twice the Child Node.**

Interpreting the Study #4 Decision Tree

In examining the decision tree created for Study #4, Node 0 indicates that among the 905 students in the cohort, 37% were transfer directed, while 63% were not transfer directed in a six year period. Examining the various demographic, momentum points, assessment results, student service and instructional strategies that were loaded into the Study #3 segmentation model as possible predictor variables, successfully completing transfer level math loaded as the primary and only predictor variable.

Identifying Possible Proactive Strategies

Table 4 identified possible momentum points, student service, and instructional strategies that were statistically significantly related to achieving any milestone. Each of these strategies represents possible proactive strategies that the college can implement in order to increase the likelihood that students will become transfer directed. Accordingly, an Exhaustive CHAID segmentation model was generated for each statistically significant result with either the number of years it took the student to reach the momentum point or the number of times a student engaged in the behavior.

The results of the Exhaustive CHAID segmentation models are summarized below. Each bullet represents a separate category of students. As an illustration, 327 students completed a transfer level math course within six years, and of those 327 students, 88% or 287 were transfer directed. In addition, 578 did not successfully complete transfer level math, and of those 578, 8% or 45 were transfer directed. Forty-five students were identified as transfer directed because of work that the student completed at another college.

Momentum Points

- Number of Years to Complete Transfer Level Math and be Transfer Directed
  - 88% of students who successfully complete **transfer level math within six years** become transfer directed
  - 8% of students who did not complete transfer level math become transfer directed

- Number of Years to Complete Transfer Level English and be Transfer directed
  - 60% of students who successfully complete **transfer level English within two years** become transfer directed
  - 37% of students who successfully complete transfer level English from 3 to 5.5 years become transfer directed
  - 7% of students who successfully complete transfer level English in six years or not all become transfer directed
- Number of Years to Complete College Level Math and be Transfer directed
  - 70% of students who successfully complete **college level math within the first year** become transfer directed
  - 58% of students who successfully completed college level math within 2 to 2.5 years become transfer directed
  - 42% of students who successfully completed college level math within 3 to 5 years become transfer directed
  - 37% of students who placed into college level math or higher become transfer directed
  - 6% of students who successfully completed college level math within 6 years or do not complete college level math become transfer directed
- Number of Years to Complete Basic Skills Math and be Transfer directed
  - 63% of students who successfully complete **basic skills math within 1 year** become transfer directed
  - 46% of students who place into college level or transfer level math become transfer directed
  - 39% of students who successfully complete basic skills math from 2 to 5 years become transfer directed
  - 4% of students who successfully complete basic skills math in 6 years or do not complete basic skills math become transfer directed

- Number of Terms to Earn 15 Units and be Transfer directed
  - 69% of students who **earn 15 units in their first term** become transfer directed
  - 48% of students who earn 15 units in their second semester become transfer directed
  - 39% of students who earn 15 units from 2 to 3 years become transfer directed
  - 24% of students who earn 15 units from 4 to 5.5 years become transfer directed
  - 9% of students who earn 15 units in 6 years or not at all become transfer directed
- Number of Terms to Earn 30 Units and be Transfer directed
  - 69% of students who **earn 30 units in within 2 years** become transfer directed
  - 39% of students who earn 30 units in 3 to 5 years become transfer directed
  - 12% of students who earn 30 units in 6 years or not at all become transfer directed

Student Service Strategies

- Number of Times Student Met with a Counselor and be Transfer Directed
  - 48% of students who **met with a counselor 6 or more times** become transfer directed
  - 26% of students who met with a counselor 5 or less times become transfer directed

Instructional Strategies

- Number of Times Student Visited the Tutoring Center and become transfer directed
  - 47% of students who **visited the Tutoring Center 1 or more times** become transfer directed
  - 34% of students who did not visit the Tutoring Center become transfer directed

- Number of Times Students Enrolled Full-Time and be Transfer directed
  - 78% of students who **enrolled full-time in 5 or more semesters** become transfer directed
  - 55% of students who enrolled full-time in 2 – 3 semesters become transfer directed
  - 26% of students who enrolled full-time in 2 semesters become transfer directed
  - 16% of students who did not enroll full-time or enrolled full-time in 1 semester become transfer directed
- Number of Times Students Enrolled in a Summer Semester and be Transfer directed
  - 59% of students who **enrolled in 2 or more summer semesters** became transfer directed
  - 37% of students who enrolled in 1 summer semester became transfer directed
  - 28% of students who did not enroll in a summer semester became transfer directed

Earning a Degree or Certificate

Figure 22: CHC 2005-2006 First-Time College Students Six-Year Degree or Certificate Totals by Momentum Point.

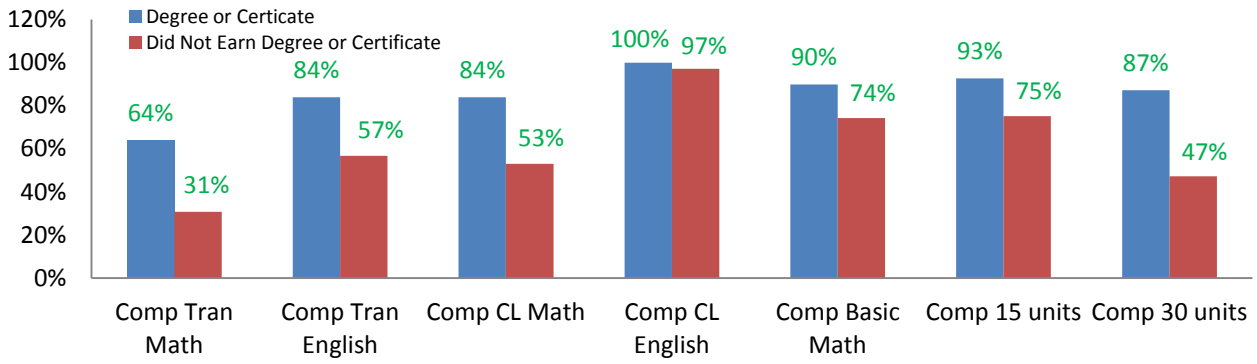


Figure 23: CHC 2005-2006 First-Time College Students Six-Year Degree or Certificate Totals by Student Assessment Results.

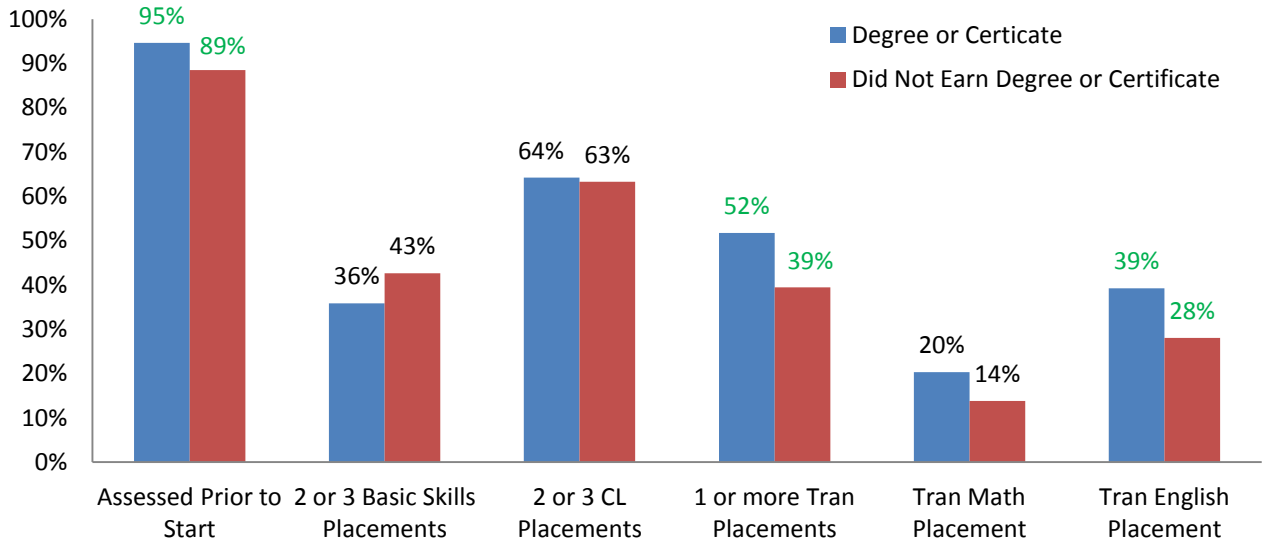
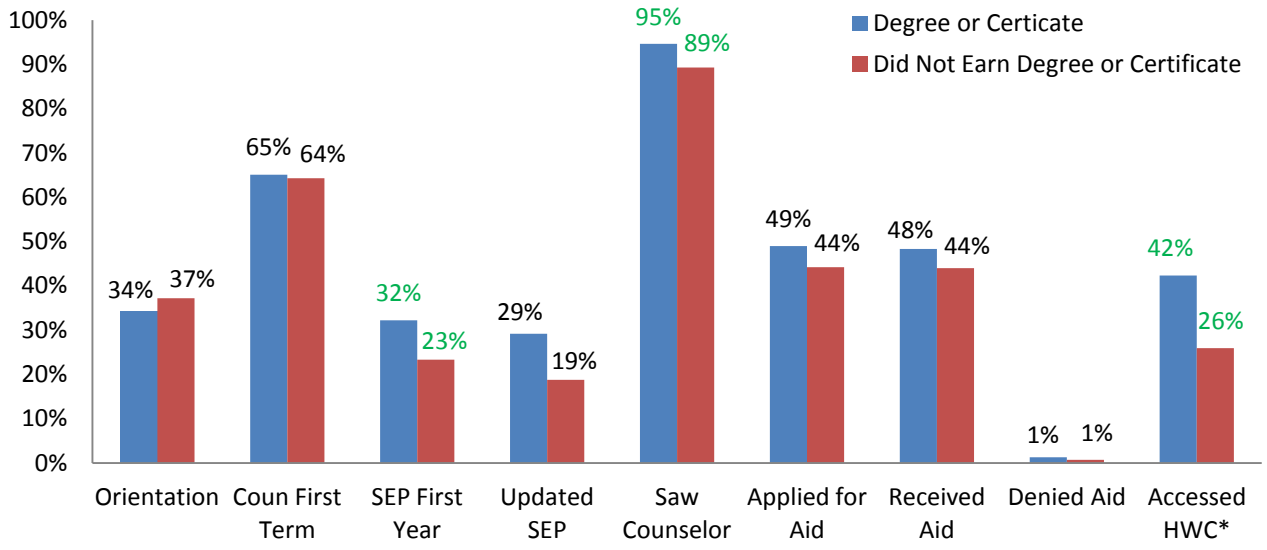


Figure 24: First-Time College CHC Students Six-Year Degree or Certificate Totals by Student Services Strategies.



*The relationship is stronger for non-occupational students (i.e. Students who did not successfully complete a clearly or advanced occupational course). Specifically, 29% of non-occupational students who accessed the HWC earned a degree or certificate; whereas, 18% of non-occupational students who did not access the HWC earned a degree or certificate (p = .091, ES = .29). Conversely, 49% of occupational students who accessed the HWC earned a degree or certificate; whereas, 39% of occupational students who did not access the HWC earned a degree or certificate (p = .078, ES = 21). Accordingly, accessing the HWC is more likely to have a stronger positive relationship with occupational than non-occupational students.

Figure 25: First-Time College CHC Students Six-Year Degree or Certificate Totals by Instructional Strategies.

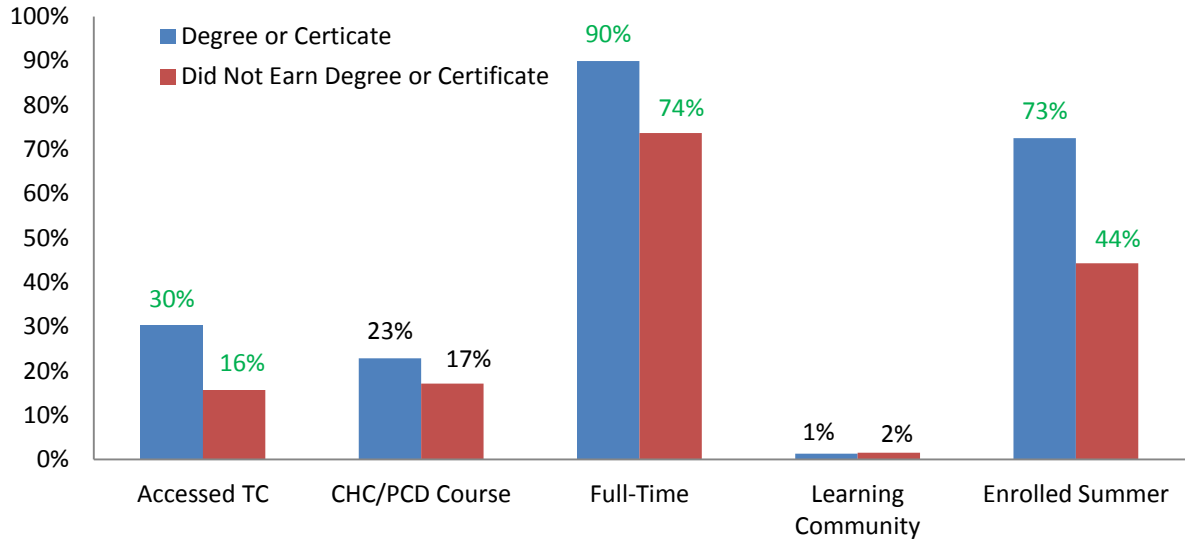


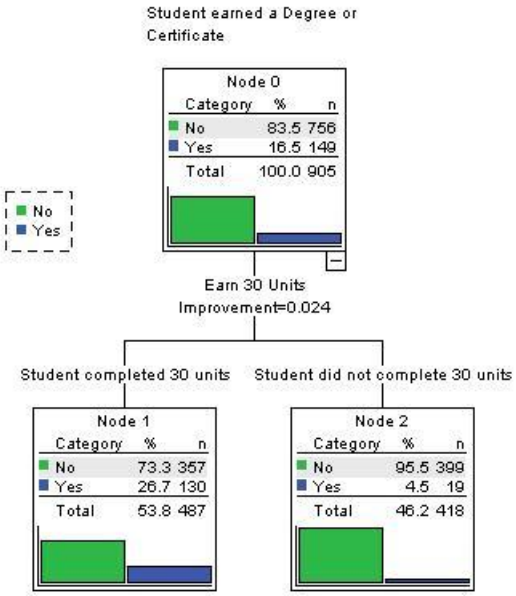
Table 5: Effect Size, 95% Confidence Intervals, and P-Values for Students who earned a Degree or Certificate by Momentum Point, Assessment Results, Student Service and Instructional Strategies.

	No			Yes			Effect Size & 95% CI Lower & Upper ES			P-Value
	#	N	%	#	N	%	ES	Lower	Upper	
Momentum Points										
Completed Tran Math	232	756	**30.7**	95	149	**63.8**	**0.71**	0.53	0.89	**< .001**
Completed Tran Engl	429	756	**56.7**	125	149	**83.9**	**0.57**	0.39	0.75	**< .001**
Completed CL Math	401	756	**53.0**	125	149	**83.9**	**0.64**	0.46	0.82	**< .001**
Completed CL Engl	734	756	**97.1**	149	149	**100.0**	**0.19**	0.01	0.36	**.035**
Completed Basic Skills Math	561	756	**74.2**	134	149	**89.9**	**0.38**	0.20	0.55	**< .001**
Completed 15 Units	568	756	**75.1**	138	149	**92.6**	**0.43**	0.25	0.60	**< .001**
Completed 30 Units	357	756	**47.2**	130	149	**87.2**	**0.84**	0.66	1.02	**< .001**
Assessment										
Assessed Prior to First Start Date	669	756	**88.5**	141	149	**94.6**	**0.20**	0.02	0.38	**.025**
2 or 3 Basic Skills Placements	275	645	42.6	48	134	35.8	-0.14	-0.32	0.05	.145
2 or 3 CL Placements	202	319	63.3	52	81	64.2	0.02	-0.23	0.26	.884
1 or More Tran Placements	293	744	**39.4**	77	149	**51.7**	**0.25**	0.07	0.43	**.007**
Tran Math Placement	102	737	13.8	30	148	20.3	0.18	0.00	0.36	.072
Tran Engl Placement	206	736	**28.0**	58	148	**39.2**	**0.25**	0.07	0.42	**.011**
Student Service Strategies										
Orientation	281	756	37.2	51	149	34.2	-0.06	-0.24	0.11	.497
Counseling First Term	486	756	64.3	97	149	65.1	0.02	-0.16	0.19	.850
SEP First Year	176	756	**23.3**	48	149	**32.2**	**0.21**	0.03	0.38	**.032**
Updated SEP	33	176	18.8	14	48	29.2	0.26	-0.06	0.58	.156
Saw Counselor	675	756	**89.3**	141	149	**94.6**	**0.18**	0.00	0.36	**.045**
Applied for Aid	334	756	44.2	73	149	49.0	0.10	-0.08	0.27	.281
Received Aid	333	756	44.0	72	149	48.3	0.09	-0.09	0.26	.338
Denied Aid	5	756	0.7	2	149	1.3	0.08	-0.10	0.25	.386
Used HWC	196	756	**25.9**	63	149	**42.3**	**0.36**	0.19	0.54	**< .001**
Instructional Strategies										
Tutoring Center	119	756	**15.7**	45	149	**30.2**	**0.38**	0.20	0.55	**< .001**
CHC/PCD Course	129	756	17.1	34	149	22.8	0.15	-0.03	0.33	.123
Full-Time	557	756	**73.7**	134	149	**89.9**	**0.39**	0.21	0.56	**< .001**
Learning Community	11	756	1.5	2	149	1.3	-0.01	-0.19	0.17	.916
Summer	335	756	**44.3**	108	149	**72.5**	**0.58**	0.40	0.75	**< .001**

Study #5: Students who earned a Degree or Certificate

Study #5 examines students who earned a degree or certificate within six years (coded as “1”) and students who did not earn a degree or certificate within six years (coded as “0”).

CART Segmentation Model Showing the Predictors of Earning a Degree or Certificate



***Risk Estimate = .094, SE of Risk Estimate = .010, Improvement set to .01, Child Node set to 5% of Total N, Parent Node is twice the Child Node.**

Interpreting the Study #5 Decision Tree

In examining the decision tree created for Study #5, Node 0 indicates that among the 905 students in the cohort, 17% earned a degree or certificate, while 84% did not earn a degree or certificate in a six year period. Examining the various demographic, momentum points, assessment results, student service and instructional strategies that were loaded into the Study #5 segmentation model as possible predictor variables, completing 30 units loaded as the primary and only predictor variable.

Identifying Possible Proactive Strategies

Table 5 identified possible momentum points, student service, and instructional strategies that were statistically significantly related to achieving any milestone. Each of these strategies represents possible proactive strategies that the college can implement in order to increase the likelihood that students will earn a degree or certificate. Accordingly, an Exhaustive CHAID segmentation model was generated for each statistically significant result with either the number of years it took the student to reach the momentum point or the number of times a student engaged in the behavior.

The results of the Exhaustive CHAID segmentation models are summarized below. Each bullet represents a separate category of students. As an illustration, 327 students completed a transfer level math course within six years, and of those 327 students, 88% or 287 were earn a degree or certificate. In addition, 578 did not successfully complete transfer level math, and of those 578, 8% or 45 were earn a degree or certificate. Forty-five students were identified as earning a degree or certificate because of work that the student completed at another college.

Momentum Points

- Number of Years to Complete Transfer Level Math and Earned a degree or certificate
    - 29% of students who successfully complete **transfer level math in six years of less** earned a degree or certificate
    - 9% of students who did not complete transfer level math earned a degree or certificate

- Number of Years to Complete Transfer Level English and be Earned a degree or certificate
    - 24% of students who successfully complete **transfer level English within 3.5 years** earned a degree or certificate
    - 7% of students who successfully complete transfer level English in 4 to 6 years or not all earned a degree or certificate
- Number of Years to Complete College Level Math and Earned a degree or certificate
    - 25% of students who successfully complete **college level math in three years** earned a degree or certificate
    - 7% of students who successfully completed college level math in 4 to 6 years or do not complete college level math earned a degree or certificate
- Number of Years to Complete Basic Skills Math and Earned a degree or certificate
    - 26% of students who successfully complete **basic skills math in 1 to 3.5 years** earned a degree or certificate
    - 18% of students who place into college level or transfer level math or successfully complete a basic skills math course in their first semester earned a degree or certificate
    - 7% of students who successfully complete basic skills math in 4 to 6 years or do not complete basic skills math earned a degree or certificate
- Number of Terms to Earned 15 Units and be Earned a degree or certificate
    - 31% of students who **earned 15 units in their first term** earned a degree or certificate
    - 20% of students who earned 15 units within 3.5 years earned a degree or certificate
    - 5% of students who earned 15 units in 4 to 6 years or not at all earned a degree or certificate

- Number of Terms to Earned 30 Units and be Earned a degree or certificate
  - 29% of students who **earned 30 units within 4 years** earned a degree or certificate
  - 5% of students who earned 30 units in 5 to 6 years or not at all earned a degree or certificate

Student Service Strategies

- Number of Times Students Met with a Counselor and Earned a degree or certificate
  - 40% of students who **met with a counselor 17 or more times** earned a degree or certificate
  - 27% of students who met with a counselor 8 to 16 times earned a degree or certificate
  - 16% of students who met with a counselor 6 to 7 times earned a degree or certificate
  - 7% of students who met with a counselor 5 or less times earned a degree or certificate
- When controlling for occupational students, students utilizing the Health and Wellness Center was not related to earning a degree or certificate

Instructional Strategies

- Number of Times Students Visited the Tutoring Center and earned a degree or certificate
  - 27% of students who **visited the Tutoring Center 1 or more times** earned a degree or certificate
  - 14% of students who did not visit the Tutoring Center earned a degree or certificate

- Number of Times Students Enrolled Full-Time and be Earned a degree or certificate
  - 34% of students who **enrolled full-time in 4 or more semesters** earned a degree or certificate
  - 18% of students who enrolled full-time in 3 semesters earned a degree or certificate
  - 8% of students who enrolled full-time in 2 or fewer semesters earned a degree or certificate
- Number of Times Students Enrolled in a Summer Semester and be Earned a degree or certificate
  - 32% of students who **enrolled in 2 or more summer semesters** earned a degree or certificate
  - 20% of students who enrolled in 1 summer semester earned a degree or certificate
  - 9% of students who did not enroll in a summer semester earned a degree or certificate

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