Results of Fall 2019 AB 705 Implementation at Rio Hondo College

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August 2020

Results of Fall 2019 AB 705 Implementation at Rio Hondo College

Executive Summary

Approved in 2017, AB 705 directed community colleges to increase the numbers of students completing transfer-level English and mathematics/quantitative reasoning within their first year. The two primary strategies of AB 705 were allowing students to enroll in transfer-level English and Math/QR courses without passing placement tests or prerequisite courses and providing corequisite support courses for students who previously would have been required to take courses below transfer level.

This report addresses AB 705 implementation and results at Rio Hondo College during the Fall 2019 semester, the college's first semester of full implementation. The report focuses on four foundational topics in AB 705 implementation: (1) Access or the numbers of students taking these transfer-level courses, (2) Throughput or the numbers of students passing the courses, (3) Success or the percentage of students passing the courses, and (4) Equity or the results for different demographic groups. There were additional research questions raised by the college's AB 705/Basic Skills Task Force. The data primarily consisted of enrollments and course grades for students taking English and/or Math/QR for the first time in either Fall 2018 or Fall 2019 (not necessarily students who were new to the college).

The results indicated that RHC's first semester of full AB 705 implementation was successful in meeting the primary goals of increasing the numbers of students taking (access) and passing (throughput) transfer-level English and Math/QR courses. Compared to Fall 2018, an additional 327 first-time English students passed a transfer-level course (36.5% increase) and an additional 211 first-time Math/QR students passed a transfer-level course (64.9% increase) in Fall 2019. In terms of equity, the largest increases in throughout were for Hispanic/Latinx students and students under the age of 20.

Success rates for first-time students decreased for English and Math/QR. The rate for English dropped by 2.5 percentage points to 59.5%, which was within the course's typical term-to-term fluctuation and not statistically significant. The rate for Math/QR decreased by 9.0 percentage points to 43.9%, which was statistically significant. Section-level success rates ranged from lows of 26.9% for ENGL101 and 9.2% for MATH130 to a high of 92.9% for each course. The broad range of success rates across these two popular courses is one of the most important factors affecting successful implementation of AB 705 reforms.

There were noteworthy findings beyond the four foundational topics. Although success rates varied across different English and Math/QR courses, first-time students in support corequisites generally did about as well as the students not required to take a support course. The rate of first-time students dropping a transfer-level course before census remained relative stable for ENGL101 but saw a statistically significant 4.2% increase in Math/QR. Among first-time students with a 'D', 'F', or 'W' mark for transfer-level English or Math/QR in Fall 2018, only about one-sixth returned and passed a transfer-level course in Spring 2019. Most of the first-time students in Fall 2019 took either transfer-level English or Math/QR but not both. The students who did take both subjects were more likely to pass both or not pass either. While tests of statistical significance did not yield consistent results, there were notable decreases in Math/QR success rates for Latino Males (12.0%) and students below age 20 (11.2%).

The report concludes with a set of 17 implications for AB 705 implementation. The implications address campus understanding of AB 705, success rates, curriculum, counseling, academic support, equity, research, and related subjects. The implications are designed to build on the first semester and improve AB 705 implementation in future terms.

Introduction

Consistent with other statewide community college initiatives, AB 705 was designed to increase the numbers of students who complete transfer-level English and mathematics/quantitative reasoning (Math/QR) in one year. While allowing students to enroll in transfer-level English and Math/QR courses without passing placement tests or prerequisite courses, AB 705 also provides for support courses as corequisites to the transfer-level courses. These course pairings are based on placement models designed to maintain course success rates while increasing throughput (or the number of successful completions). By increasing throughput across demographic groups, AB 705 should reduce equity gaps at both the college and statewide levels.

Fall 2019, in compliance with the state deadline, was the first semester of full AB 705 implementation for Rio Hondo College. The college has experimented with basic skills reform over the past decade, more often in Math/QR than English. The most prominent initiatives were course compression and learning communities for English and Mathematics (beginning in 2010), articulating PSY190 (Statistics for the Behavioral Sciences) with University of California requirements (completed in 2011), Fast-Track Math (beginning in 2012), MATH062 (Pre-Statistics) as a prerequisite path to MATH 130 (Statistics) (beginning in 2017), and allowing students to place themselves into any Mathematics course below transfer level (Fall 2018 and Spring 2019).[1]

This report, based on analysis conducted in early 2020, addresses the results of AB 705 implementation in Fall 2019. Due to its focus on the first semester of implementing an initiative designed to produce one-year results, the results should be viewed as preliminary.

The analysis and reporting are organized around a set of research questions. The initial questions are on topics inherent to the AB 705 initiative (access, throughput, success rates, equity).

1) Access: Did more students take transfer-level English and Math/QR in Fall 2019 than in Fall 2018?
2) Throughput: Did more students pass transfer-level English and Math/QR in Fall 2019 than in Fall 2018?
3) Success: How did Fall 2019 success rates compare to those for Fall 2018?
4) Equity: What were the results for different demographic groups?

The remaining questions are in response to items raised by members of the college's AB 705/Basic Skills Task Force.

5) Of students with a D/F/W mark for Fall 2019, how many registered to repeat the course in Spring 2020?
6) How many students dropped?
7) How did the success rates for students requiring Support/Essential Topics courses compare to those who did not?
8) What implementation factors could influence the results?
9) What were the results for students taking both transfer-level English and Math/QR?

[1] The term "Mathematics" and the abbreviation "MATH" refer to the college's Mathematics department. The term Math/QR includes Mathematics courses plus PSY190 and FIN101 (Introduction to Financial Planning). "ENGL" is the standard abbreviation for courses in the English department.

Method

The foundation for this analysis was the comparison of enrollment and results for similar students between the Fall 2019 implementation and the previous fall semester (Fall 2018). Of the many possible groups of students to include in the sample, the Office of Institutional Research and Planning (IRP) decided to focus on students who were taking ENGL101 or a transfer-level Math/QR course as a first-time student in that subject. These criteria included the largest group of relevant students while minimizing potential effects of previously taking a course in the subject. For example, students who had previously passed a prerequisite course or not passed the transfer-level course would bring a different set of knowledge and experiences than would students taking their first college course in the subject.

There were two samples for this analysis: one each for ENGL101 and transfer-level Math/QR. Headcounts for students in these samples are presented in Exhibit 1. For Fall 2019, 704 students attempted both ENGL101 and transfer-level math/QR; the remaining 1,867 took either one or the other.[2]

Exhibit 1) Headcounts in Student Samples

Subject	Fall 2018	Fall 2019
English	1,442	2,053
Math/QR	615	1,222

Students in the English sample took ENGL101 for the first time in either Fall 2018 or Fall 2019. The sample excludes students who took any English (ENGL) or English as a New Language (ENLA) course or EDEV030 before ENGL101.[3]

Similarly, students in the Math/QR sample took transfer-level Math/QR for the first time in either Fall 2018 or Fall 2019. The sample excludes students who took any Math/QR course before enrolling in transfer-level Math/QR for Fall 2018 or Fall 2019. Both the ENGL101 and transfer-level Math/QR samples include first-time RHC students and returning students who had not previously taken an English or Math/QR course, respectively.

The selection process began with all students enrolled in ENGL101 or transfer-level Math/QR for the Fall 2018 or Fall 2019 semesters. The next step was to query records from the college's Banner student information system and identify students with a previous RHC course in either English or Math/QR, respectively, or who had transferred in a relevant course at any time. Because the college's Banner student information system records courses according to the semester they were transferred to RHC, rather than the semester the student actually took the course, all students transferring an English or Math/QR course were excluded from that sample.[4]

[2] All references in this report to "attempting" or "taking" a course indicate that the student stayed in the course long enough that it was recorded on their transcript.

[3] Educational Development 030 (or EDEV030 English Skills) is a basic skills course offered by the Division of Disabled Students Programs and Services. It serves as an equivalent to ENGL030 (Introductory Composition for Developing Writers).

[4] There is a possibility that the samples include a small number of students who had taken an English or Math/QR course before Fall 1984 (the earliest enrollments recorded in Banner) or at another college without transferring the course to RHC.

Unless otherwise noted, all student counts are for the students in these samples. There are some exceptions. Parts of the analysis for the sixth research question, on students who dropped, includes first-time students in ENGL or MATH courses below transfer level or students who had previously taken English or Math/QR. Additional analysis for the seventh research question under Math/QR addresses the proportion of Essential Topics students who were not in Fall 2019 sample. Analysis for dispersion of success rates across sections (question eight for ENGL101 and Math/QR) includes success rates for all students in each section.

Following this Introduction, this report has two sections. The second section addresses results for English, Math/QR, and students taking both subjects. The third section summarizes the results and provides implications for both implementation and future research.

Results

Transfer-Level English

AB 705 Implementation at Rio Hondo College

The college's primary transfer-level English course is ENGL101 (College Composition and Research). It is the course meeting the Written Communication requirement for an RHC associate degree, CSU General Education, and the UC Intersegmental General Education Transfer Curriculum (IGETC). Prior to Fall 2019, students enrolling in ENGL101 would have needed a satisfactory score on Accuplacer or to have passed ENGL035 (Introduction to College Composition) as a prerequisite.

Beginning in Fall 2019, students could enroll directly into ENGL101 without placement testing or a prerequisite. Students with a high school GPA of 2.6 or higher could enroll in ENGL101 without a corequisite support course. Students with a high school GPA between 1.9 and 2.5 took ENGL010S (English Composition Support, 1 unit) as a corequisite and students with a high school GPA below 1.9 took ENGL010SP (English Composition Support Plus, 2 units) as a corequisite. (Corequisite placement guidelines for English, Math/QR, and other subjects are in Appendix A.)

The Division of Communications and Languages paired support and ENGL101 sections (i.e., the same group of students in the support section took the ENGL101 section with the same instructor in the same classroom directly before or after the support section). All 19 sections of ENGL010S and 4 sections ENGL010SP took place in classrooms. Of the 93 ENGL101 sections, 8 were online and not connected to sections of ENGL010S or ENGL010SP.

Access

The first research question focused on "access:" *Did more students take transfer-level English in Fall 2019 than in Fall 2018?* The number of first-time English students taking ENGL101 increased from 1,442 in Fall 2018 to 2,053 in Fall 2019. This numeric increase of 611 students was 42.4% above the number of students in Fall 2018 and represents an overall increase in the number of students who were able to access the course.

Successful Completions & Success Rates

The second research question addressed "throughput:" *Did more students pass transfer-level English in Fall 2019 than in Fall 2018?*[5] Substantially more first-time ENGL students passed ENGL101 in Fall 2019 than in Fall 2018. The increase from 2018 to 2019 was from 895 to 1,222 (Exhibit 2). This was a 36.5% increase with 327 more first-time ENGL students passing ENGL101 in Fall 2018 than in Fall 2019.

Exhibit 2) Successful Completions by First-Time ENGL101 Students

Fall 2018 Count	Fall 2019 Count	Difference in Count	Difference in Percentage
895	1,222	327	36.5%

While the second research question addressed the number of completers, the third question involved the rate of successful completion: *How did Fall 2019 success rates compare to those for Fall 2018?* The success rate is the percentage of students who complete the course with a 'C' grade or better. It is calculated by dividing the number of students successfully completing the course by the number of

[5] In order to meet general education requirements, a student must pass ENGL101 with a 'C' grade or better. All references in this report to "passing' or "success" mean a 'C' grade or better.

students enrolled in the course (i.e., the number of students enrolled in the course long enough to have a letter grade or 'W' mark added to their transcripts). There was a 2.5 percentage point decrease in success rates for the first-time ENGL students in ENGL101 from 62.1% in Fall 2018 to 59.5% in Fall 2019 (Exhibit 3).

The chi-square statistic (X^2) tests the relationship between two categorical (non-numeric) variables (in Exhibit 3, semester and course success). It compares the actual counts to the expected counts if there were no relationship between the two variables. For first-time students in ENGL101, chi-square analysis indicated the 2.5 percentage point decrease was not large enough to be statistically significant (X^2 = 2.30, p = .130) and most likely due to normal, semester-to-semester fluctuations in success rates.

Exhibit 3) Success for First-Time ENGL101 Students

		Semester		
		Fall 2018	**Fall 2019**	**Total**
Success	**No**	547	831	1,378
	Yes	895	1,222	2,117
	Rate	62.1%	59.5%	60.6%

Student Equity

The fourth research question spoke to student equity: *What were the results for different demographic groups?* Successful implementation of AB 705 should reduce equity gaps and not lead to increases in any gaps. Although it is too early in AB 705 implementation to examine changes in existing equity gaps, this report addresses two immediate changes for demographic groups: throughput and success rates. The equity analysis included eight ethnic categories, three gender categories, three ethnicity-gender categories, and four age groups. Noteworthy changes in throughput (or headcount of successful completions) appear in Exhibit 4.[6]

Exhibit 4) Numbers of Successful Completions by Demographic Groups

Group	Fall 2018 Count	Fall 2019 Count	Difference #	Difference %
Asian	56	50	-6	-10.7%
Hispanic/Latinx	798	1,081	283	35.5%
White	30	36	6	20.0%
Latina Female	428	560	132	30.8%
Latino Male	368	516	148	40.2%
Age Below 20	747	1,070	323	43.2%

The California Community Colleges Chancellor's Office (CCCCO) encourages colleges to break out results by ethnicity and gender in order to conduct more fine-grained analysis of equity gaps. For this purpose, Rio Hondo College combines students into three ethnicity-gender groups: Latina Female, Latino Male, and All Other. Among the 2,053 first-time ENGL students who took ENGL101 in Fall 2019, 921 (44.9%) were Latina, 920 (44.8%) were Latino, and 212 (10.3%) were in the All Other category. The overall decrease in success rates between Fall 2018 and Fall 2019, 2.5 percentage points, was distributed rather

[6] Because some of the successful Hispanic/Latinx students did not report a binary gender, the Hispanic/Latinx count is greater than the sum of Latina Female and Latino Male.

evenly across the groups (Exhibit 5). There were no year-to-year changes meeting the CCCCO criteria for disproportionate impact and chi-square analysis did not reveal any statistically significant differences.

Exhibit 5) Success Rates for Three Ethnicity-Gender Groups

Group	Fall 2018	Fall 2019	Difference
Latina Female	63.3%	60.8%	-2.5% points
Latino Male	58.9%	56.1%	-2.8% points
All Other	70.2%	68.9%	-1.3% points

Students Not Successfully Completing ENGL101

The fifth and sixth research questions focused on the first-time ENGL students who did not successfully complete ENGL101 in Fall 2019. The fifth question addressed students who received a 'D', 'F', or 'W' mark in ENGL101: *Of students with a D/F/W for 2019, how many registered to repeat the course in Spring 2020?* Of the 831 first-time ENGL students who had a DFW mark in ENGL101 for Fall 2019, 199 (23.9%) were enrolled in an ENGL, ENLA, or EDEV030 course at the start of Spring 2020 (Exhibit 6). Of the 199, 182 enrolled in ENGL101. In comparison, among the 547 first-time ENGL students who had a DFW mark in ENGL101 for Fall 2018, 172 (31.4%) registered in an English course for Spring 2019. Chi-square analysis indicated that the decrease from 31.4% to 23.9% was statistically significant ($X^2 = 9.42$, p = .002), indicating that the difference between the rate of re-enrollment the following term was large enough to conclude it is not simply a matter of normal or expected fluctuation. It is unclear, however, as to why this is the case. The 143 students who returned to ENGL101 for Spring 2019 and stayed past the deadline for dropping had a 49.0% success rate.

Exhibit 6) Students with DFW Mark Returning for Spring Semester

Measure	Fall 2018	Fall 2019
# Students with DFW Mark in Fall Semester	547	831
# Enrolled in English in Following Spring	172	199
% Enrolled in English in Following Spring	31.4%	23.9%
# Enrolled in ENGL101 in Following Spring	143	182
% Enrolled in ENGL101 in Following Spring	26.1%	21.9%

Note: The rows for "Enrolled in English" include students in ENGL or ENLA courses or EDEV030.

The sixth research question addressed first-time ENGL students who dropped ENGL101 before the second census (early enough not to have the course recorded on their transcripts): *How many students dropped?* Across the three courses on the ENGL sequence (ENGL030, ENGL035, and ENGL101), the number of first-time ENGL students who dropped increased by 11.6% from 251 in Fall 2018 to 280 in Fall 2019.[7] For first-time ENGL students taking ENGL101, which had a great increase in enrollment by first-time ENGL students, the drop rate was relatively stable at 10.9% for Fall 2018 and 11.5% for Fall 2019 (Exhibit 7). This 0.6 percentage point difference was not statistically significant ($X^2 = 0.34$, p = .562) and

[7] Because a much larger proportion of first-time ENGL students took ENGL101 in Fall 2019, a comparison with ENGL101 only would not be appropriate. The number of drops must include ENGL030 and ENGL035 to account for all drops by first-time ENGL students. This includes the numbers of dropping students that migrated from those courses in Fall 2018 to ENGL101 in Fall 2019. In other words, a substantial number of the students who dropped ENGL101 in Fall 2019 were likely to have dropped ENGL030 or ENGL035 had they enrolled in those courses.

indicates that the difference between Fall 2018 and Fall 2019 is likely due to normal, expected fluctuations between terms.

Exhibit 7) Drops for First-Time ENGL101 Students

		Semester		
		Fall 2018	**Fall 2019**	**Total**
Drop	**No**	1,442	2,053	3,495
	Yes	176	266	442
	Rate	10.9%	11.5%	11.2%

The analysis of dropped ENGL101 enrollments broke out the dropping students into three groups: students new to RHC, returning RHC students taking their first ENGL course, and returning students who had previously taken an ENGL or ENLA course. The numbers of drops for the two groups of students who were returning to RHC actually decreased from 215 to 209 (Exhibit 8). For students who were new to the college, the number dropping ENGL sequence courses increased 22.0% from 141 to 172. The drop rate for these students increased from 10.2% in Fall 2018 to 12.6% in Fall 2019. This 2.4 percentage point increase was large enough to be statistically significant ($X^2 = 4.04$, p = .044), indicating that it was not due to semester-to-semester fluctuation.

Exhibit 8) Drops from English Sequence Courses

Group	Fall 2018 Count	Fall 2019 Count	Difference #	Difference %
No Previous Enrollment	141	172	31	22.0%
Previous Enrollment with No English	110	108	-2	-1.8%
Previous Enrollment with English	105	101	-4	-3.8%
Total	356	381	25	7.0%

Levels of Support

The seventh research question addressed the success rates in courses with different levels of support: *How did the success rates for students requiring Support courses compare to those who did not?* During Fall 2019, first-time ENGL students taking ENGL101 without being required to take a Support course had a 60.6% success rate, students taking ENGL010S had an ENGL101 success rate of 55.0%, and students taking ENGL101SP had an ENGL101 success rate of 56.5% (Exhibit 9). The 5.5 percentage point gap between the rates for students taking ENGL101S and students with no additional no support was large enough to be statistically significant ($X^2 = 9.06$, p = .002); the difference was likely not due to chance. The 4.1 percentage point difference for ENGL010S was not significant ($X^2 = 1.71$, p = .191) and likely due to normal differences between groups. The following research question places the 5.6 percentage point difference for ENGL010S students into the larger context of success rates in ENGL101 courses.

Exhibit 9) Success for First-Time ENGL101 Students by Level of Support

		Level of Support			
		None	**ENGL010S**	**ENGL101SP**	**Total**
Success	**No**	209	15	577	831
	Yes	577	209	45	1,222
	Rate	60.6%	55.0%	56.5%	59.5%

Implementation Factors

Implementation is the focus for the eighth and final research question on transfer-level English: *What implementation factors could influence the results?* An obvious factor is the range in success rates across sections of ENGL101. Across the five academic years between Summer 2014 and Spring 2019, the section-level success rates for ENGL101 ranged from 12.0% to 100.0% (a ratio of 1 to 8). Exhibit 10 combines the first-time ENGL students' success rates from the previous paragraph and exhibit with the overall success rates for the 93 sections of ENGL101 in Fall 2019. This table shows that the range in success rates across sections of ENGL101 greatly outsized the 5.6 percentage point difference in success rates between first-time ENGL students who took ENGL101 without requiring additional support and those who were required to take ENGL010S along with ENGL101.

Exhibit 10) Section Level Success Rates for All ENGL101 Students

Support Level	First-Time Success Rate	# Sections	Minimum Section Success Rate	Maximum Section Success Rate
None	60.6%	70	26.9%	92.9%
ENGL010S	55.0%	19	33.3%	86.7%
ENGL010SP	56.5%	4	46.4%	67.9%

The broad range of success rates across ENGL101 sections raises questions of dispersion or the extent to which the extreme success rates are representative of the 93 sections as a group. For example, are the sections with 26.9% and 92.9% success rates statistical outliers (with other sections tightly clustered around the average success rate)? Or, are the section-level success rates spread somewhat evenly between 26.9% and 92.9%? The statistic designed to address these questions is the standard deviation.

The standard deviation is a measure of dispersion or how spread out the numbers are. The smaller the standard deviation, the more the individual cases are clustered close to the mean (average). A larger standard deviation indicates that the individual cases are spread more widely across the range. On a bell curve, about 68% of the sections would be within one standard deviation from the mean and about 95% would be within two standard deviations. Almost 100% of the sections would be within three standard deviations and cases more than three standard deviations from the mean can be considered outliers.

Exhibit 11 provides basic statistics on the central tendencies (typical section-level success rates) and dispersion of those success rates. The mean (or average) success rate was 58.6% and the median (the mid-point) was 57.7%. These two measures of central tendency are very close, indicating that the success rates were generally balanced between sections below and above the mean. The standard deviation and range demonstrate a rather broad dispersion of success rates.

Exhibit 11) Success Rates for ENGL101 in Fall 2019

Mean	58.6%
Standard Deviation	15.7%
Median	57.7%
Minimum	26.9%
Maximum	92.9%
Range	65.9%
Number of Sections	93

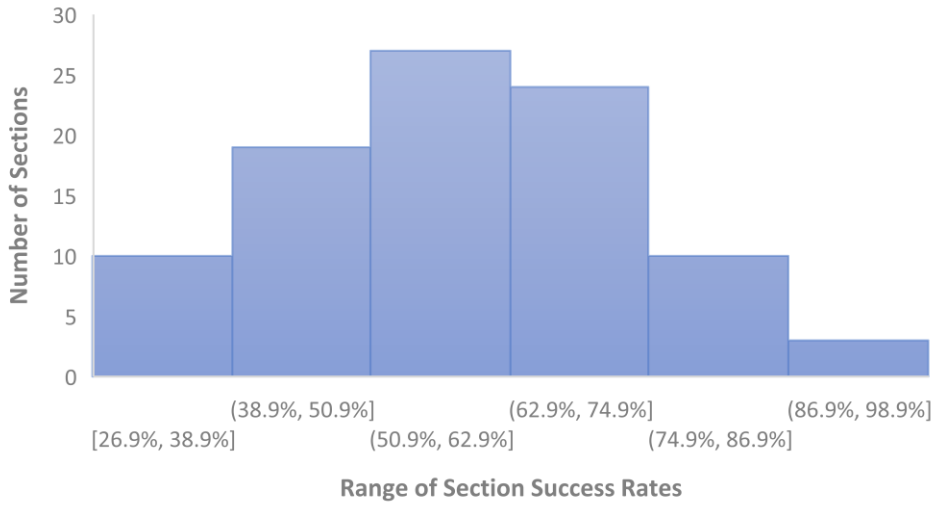
Exhibit 12 displays a breakdown of the 93 sections by their distance from the mean. Four sections were more than two standard deviations from the mean. These sections were well within three standard deviations below (11.5%) or above (105.7%) the mean, indicating that none of these sections' success rates was a statistical outlier.

Exhibit 12) Dispersion of Section Success Rates by Mean & Standard Deviation

Group	Range	Sections
More than 2 SD Below the Mean	0.0 - 27.2%	1
Between 1 SD & 2 SD Below the Mean	27.2 - 42.9%	13
Between the Mean & 1 SD Below the Mean	42.9 - 58.6%	33
Between the Mean & 1 SD Above the Mean	58.6 - 74.3%	33
Between 1 SD & 2 SD Above the Mean	74.3 - 90.0%	10
More than 2 SD Above the Mean	90.0 - 100.0%	3

Exhibit 13 visually depicts the distribution of section success rates. Consistent with Exhibits 11 and 12, this figure shows a relatively balanced distribution of 93 sections.

Exhibit 13) Histogram of ENGL101 Success Rates



Summary

The results for the first semester of AB 705 implementation for transfer-level English were generally promising, with a few areas for further consideration. First-time ENGL students' access to ENGL101 increased from Fall 2018 to Fall 2019 by 42.4% and throughput (students successfully completing the course) increased by 36.5%. The increase in throughput included an additional 283 Hispanic/Latinx students. The 2.5 percentage point decrease in the success rates for first-time ENGL students taking ENGL101, although a result worth monitoring, was similar to the typical semester-to-semester fluctuation in success rates for ENGL101 and not statistically significant. Analysis for student equity did not reveal any new or additional disproportionate impact across demographic groups. Although the raw

number of students who dropped ENGL sequence courses increased in Fall 2019, the drop rate (percentage of students who dropped) showed a small increase.

In addition to these results indicating growth or stability, there were areas deserving additional consideration. The most important of these was the broad range in success rates across ENGL101 sections (from 26.9% to 92.9% in Fall 2019). Put simply, this means that students in some sections were three times more likely to pass than were students in other sections of the same course. Although the success rate gaps for students in support courses (5.6 percentage points for ENGL010S and 4.1 percentage points for ENGL010SP) could be meaningful results worthy of future monitoring, they also might be the product of which ENGL101 sections were attached to Support sections. Increasing consistency in success rates across ENGL101 will be integral to improving AB 705 implementation.

Two other results merit additional consideration. The first involves the students who dropped English sequence courses. While the numbers of students dropping decreased slightly for students who were returning to RHC, there was a 22% increase among students new to the college. The resultant 2.4% increase in the drop rate was large enough to be statistically significant. The increase in dropping courses was exclusively among the focal population for AB 705, first-time students. This finding deserves attention in future semesters to determine whether it is part of a trend. The second involves students with DFW marks returning to take ENGL, ENLA, or EDEV030 in the spring semester. For both Fall 2018 (31.4%) and Fall 2019 (23.9%), the percentages of these students were relatively low. Although there was a sharp and statistically significant decrease in the return rate for Fall 2019, that might not be the problem it appears to be. The students who returned to take ENGL101 in Spring 2019 had a 49.0% success rate, which was well below the overall 61.8% success rate for ENGL101 students. The low percentage of returning students and their resultant success rate indicate an area for attention by Academic Affairs and Student Services.

Transfer-Level Mathematics & Quantitative Reasoning

AB 705 Implementation at Rio Hondo College

The college's paths for transfer-level Mathematics & Quantitative Reasoning (Math/QR) are much more complicated than for transfer-level English. They involve eight courses across three academic departments. Five of the courses, all within MATH, have a support course known as "Essential Topics" (e.g., MATH013E Essential Topics for Statistics). While seven of the courses do not have another transfer-level course as a prerequisite, MATH180 has MATH175 listed as a prerequisite. Course details are in Exhibit 14.

Exhibit 14) Math/QR Courses in AB 705 Implementation

Department	Course Number	Course Name	Essential Topics	CSU Transfer	UC Transfer	Level
Finance	FIN101	Introduction to Financial Planning	None	Yes	No	1
Mathematics	MATH130	Statistics	MATH013E	Yes	Yes	1
Mathematics	MATH140	Mathematics for Elementary Teachers	None	Yes	Yes	1
Mathematics	MATH150	Quantitative Reasoning in Today's World	MATH015E	Yes	No[8]	1
Mathematics	MATH160	College Algebra	MATH016E	Yes	Yes	1
Mathematics	MATH175	Plane Trigonometry	MATH017E	Yes	Yes	1
Mathematics	MATH180	Pre-Calculus	MATH018E	Yes	Yes	2
Psychology	PSY190	Statistics for the Behavioral Sciences	None	Yes	Yes	1

Beginning in Fall 2019, students could enroll directly into transfer-level Math/QR without assessment testing or a prerequisite. Based on their high school GPA and math courses, students enrolled in transfer-level Math/QR courses with an Essential Topics course either not recommended, recommended, or required. Unlike English, different types of Math/QR courses had different guidelines. Detailed information is in Appendix A.

The Division of Mathematics, Sciences, and Engineering paired Essential Topics and transfer-level sections (i.e., the same group of students in the Essential Topics section took the transfer-level Math/QR section with the same instructor in the same classroom directly before or after the Essential Topics section). All 22 sections of Essential Topics courses took place in classrooms. There were nine sections of MATH013E, five of MATH015E, four of MATH016E, three of MATH017E, and one of MATH018E. With the exception of MATH015E at two units, each Essential Topics was a one-unit course. Of the college's 82 sections of the 8 transfer-level Math/QR courses, 7 (8.5%) were online. Each of these seven sections was in Mathematics.[9]

[8] Beginning in the Fall 2020 semester, MATH150 (now named "Survey of Mathematics") will be UC transferable.
[9] The 82 transfer-level sections included one section of MATH130H "Statistics Honors," which enrolled 3 students in the sample for this study.

Although the focus for AB 705 implementation was on the eight courses identified above, several students began their Math/QR coursework in higher-level Mathematics courses. Overall, there were 95 first-time Math/QR students in Fall 2018 and 70 in Fall 2019 whose first Math/QR course was one of the following: MATH170 (Elements of Calculus), MATH190 (Calculus I), MATH190H (Calculus I Honors), MATH191 (Calculus II), MATH250 (Calculus III), MATH260 (Linear Algebra), or MATH270 (Differential Equations).[10]

Access

The first research question focused on "access*:" Did more students take transfer-level Math/QR in Fall 2019 than in Fall 2018?* The number of first-time Math/QR students taking a transfer-level Math/QR course almost doubled, increasing from 615 in Fall 2018 to 1,222 in Fall 2019. This numeric increase of 607 students was 98.7% above the number of students in Fall 2018 and represents an overall increase in the number of students who were able to access the course.

Successful Completions & Success Rates

The second research question addressed "throughput:" *Did more students pass transfer-level Math/QR in Fall 2019 than in Fall 2018?*[11] Substantially more first-time Math/QR students passed a transfer-level course in Fall 2019 than in Fall 2018. The increase from 2018 to 2019 was from 325 to 536 (Exhibit 15). This was a 64.9% increase with 211 more first-time Math/QR students passing a transfer-level course in Fall 2019 than in Fall 2018 and represents an overall increase in the number of students who were able to access the course.

Exhibit 15) Successful Completions by First-Time Math/QR Students

Fall 2018 Count	Fall 2019 Count	Difference in Count	Difference in Percentage
325	536	211	64.9%

While the second research question addressed the number of completers, the third question involved the rate of successful completion: *How did Fall 2019 success rates compare to those for Fall 2018?* The success rate is the percentage of students who complete the course with a 'C' grade or better. It is calculated by dividing the number of students successfully completing the course by the number of students enrolled in the course (i.e., the number of students enrolled in the course long enough to have a letter grade or 'W' mark added to their transcripts). There was a 9.0 percentage-point decrease in success rates for the first-time Math/QR students in transfer-level courses from 52.8% in Fall 2018 to 43.9% in Fall 2019 (Exhibit 16).

The chi-square statistic (X^2) tests the relationship between two categorical (non-numeric) variables (in Exhibit 16, semester and course success). It compares the actual counts to the expected counts if there were no relationship between the two variables. For first-time students in transfer-level Math/QR, chi-square analysis indicated that the 9.0 percentage point difference was statistically significant ($X^2 = 13.26$, $p < .001$), indicating that this difference was large enough not to be due to normal or expected fluctuation.

[10] MATH170 has MATH160 listed as its prerequisite. Each of the other higher-level MATH courses mentioned here has MATH180 or higher listed as a prerequisite.

[11] In order to meet general education requirements, a student must pass the course with a 'C' grade or better. All references in this report to "passing" or "success" mean a 'C' grade or better.

Exhibit 16) Success for First-Time Math/QR Students

		Semester		
		Fall 2018	**Fall 2019**	**Total**
Success	**No**	290	686	976
	Yes	325	536	861
	Rate	52.8%	43.9%	46.9%

The 9.0 percentage-point overall decrease in success rates was not consistent across different types of Math/QR courses. This analysis was based on four types of Math/QR courses: (1) SLAM or Statistics and Liberal Arts Math, which included MATH130, MATH130H, and MATH150; (2) B-STEM or Business, Science, Technology, Engineering, and Math, which included MATH160 and MATH175; (3) Calculus, which included MATH170, MATH180, and all higher-level courses; and (4) Other Transfer-Level, which included FIN101, MATH140, and PSY190.[12]

As displayed in Exhibit 17, decreases in success rates for SLAM and B-STEM courses were slightly larger than the overall 9.0% percentage-point decrease. The calculus sequence, with fewer first-time students than in Fall 2018, had a decrease of 4.1 percentage points. The largest decrease was in the Other Transfer-Level Math/QR courses with 14.4 percentage points. Despite this large decrease, the Other Transfer-Level category had the highest success rate of the four types. Chi-square analysis indicated that the only statistically significant difference was for SLAM courses ($X^2 = 7.90$, $p = .005$), indicating that it was not likely due to normal or expected fluctuation from semester to semester.[13]

Exhibit 17) Year-to-Year Differences in Success Rates by Course Type

Type	Fall 2018	Fall 2019	Difference
SLAM	50.3%	40.8%	-9.5% points
B-STEM	51.9%	42.2%	-9.7% points
Calculus	53.7%	49.6%	-4.1% points
Other	87.5%	73.1%	-14.4% points
Total	52.8%	43.9%	-9.0% points

Student Equity

The fourth research question addressed student equity: *What were the results for different demographic groups?* Successful implementation of AB 705 should reduce equity gaps and not lead to increases in any gaps. Although it is too early in AB 705 implementation to examine changes in existing equity gaps, this report addresses two immediate changes for demographic groups: throughput and success rates. The equity analysis included eight ethnic categories, three gender categories, three ethnicity-gender

[12] MATH140 (Mathematics for Elementary Teachers) is unique in that involves several different types of mathematics and serves as a prerequisite for an additional course (MATH141, which is required for a bachelor's degree in elementary education). Although a course of the Mathematics department, it does not fit into any other group of MATH courses.

[13] Tests for statistical significance are a function of relationship and sample size. Although SLAM courses did not have the largest year-to-year difference, they had by far the largest sample size (988 enrollments). This explains the statistical significance.

categories, and four age groups. Noteworthy changes in throughput (or headcount of successful completions) appear in Exhibit 18.[14]

Exhibit 18) Numbers of Successful Completions by Demographic Groups

Group	Fall 2018 Count	Fall 2019 Count	Difference #	Difference %
Female	173	264	91	52.6%
Male	149	267	118	79.2%
Hispanic/Latinx	266	441	175	65.8%
Latina Female	139	224	85	61.2%
Latino Male	126	215	89	70.6%
Age Below 20	261	413	152	58.2%

The California Community Colleges Chancellor's Office (CCCCO) encourages comparing group success rates to identify disproportionate impact or statistically significant equity gaps. Most demographic groups had 2018-to-2019 differences near the overall 9.0% percentage point decrease. Three groups, however, had an increase of more than 2.0 percentage points or a decrease of more than 11.0 percentage points. Although none of the year-to-year changes in group-level success rates met the CCCCO criteria for disproportionate impact, chi-square analysis indicated that the decreases for Latino males ($X^2 = 10.09$, $p = .001$) and students below age 20 ($X^2 = 17.15$, $p < .001$) were large enough to be statistically significant and not due to chance (Exhibit 19).

Exhibit 19) Notable Changes in Success Rates by Demographic Groups

Group	Fall 2018	Fall 2019	Difference
White*	35.3%	63.2%	27.9% points
Latino Male	50.8%	38.8%	-12.0% points
Age Below 20	52.1%	40.9%	-11.2% points

*Note: In Fall 2018, only 17 students in the sample identified as being of White ethnicity.

Students Not Successfully Completing Transfer-Level Math/QR

The fifth and sixth research questions focused on the first-time Math/QR students who did not successfully complete transfer-level Math/QR in Fall 2019. The fifth question addressed students who received a 'D', 'F', or 'W' mark in transfer-level Math/QR: *Of students with a DFW for 2019, how many registered to repeat Math/QR in Spring 2020?* Of the 686 first-time Math/QR students who had a DFW mark for transfer-level Math/QR in Fall 2019, 234 (34.1%) were enrolled in a Math/QR course at the beginning of Spring 2020 (Exhibit 20). Of the 234, 207 were in a transfer-level course. In comparison, among the 290 first-time Math/QR students who had a DFW in transfer-level Math/QR in Fall 2019, 110 (37.9%) registered for a Math/QR course in Spring 2019. Chi-square analysis indicated that the decrease from 37.9% to 34.1% was not statistically significant ($X^2 = 1.30$, $p = .254$), indicating that it was due to normal or expected fluctuation between semesters. The 94 students who returned to transfer-level Math/QR in Spring 2019 and stayed past the deadline for dropping had a 46.8% success rate.

[14] Because some of the successful Hispanic/Latinx students did not report a binary gender, the Hispanic/Latinx count is greater than the sum of Latina Female and Latino Male.

Exhibit 20) Students with DFW Mark Returning for Spring Semester

Measure	Fall 2018	Fall 2019
# Students with DFW Mark in Fall Semester	290	686
# Enrolled in Math/QR in Following Spring	110	234
% Enrolled in Math/QR in Following Spring	37.9%	34.1%
# Enrolled in Transfer-Level Math/QR in Following Spring	94	207
% Enrolled in Transfer-Level Math/QR in Following Spring	32.4%	30.2%

The sixth research question addressed first-time Math/QR students who dropped transfer-level Math/QR before the second census (early enough not to have the course recorded on their transcripts): *How many students dropped?* Across all Math/QR courses, the number of students who dropped increased by 8.2% from 1,060 in Fall 2018 to 1,147 in Fall 2019.[15] For first-time Math/QR students in any Math/QR course, the number of students who dropped increased by 17.5% from 445 in Fall 2018 to 523 in Fall 2019. For first-time Math/QR students in transfer-level courses, the increase was 169.2% from 104 in Fall 2018 to 280 in Fall 2019 (Exhibit 21). Due to the large increase in first-time Math/QR students taking transfer-level courses, the drop rate showed an increase of 4.2 percentage points. This increase was large enough to be statistically significant ($X^2 = 5.93$, p = .015), indicating that it was not due to normal or expected fluctuation.

Exhibit 21) Drops for First-Time Math/QR Students

		Semester		
		Fall 2018	Fall 2019	Total
Drop	No	615	1,222	1,837
	Yes	104	280	384
	Rate	14.5%	18.6%	17.3%

The analysis of dropped Math/QR enrollments broke out the dropping students into three groups: students new to RHC, returning RHC students taking their first Math/QR course, and returning students who had previously taken a Math/QR course. The numbers of drops for the groups of students who were new to RHC or had previously taken Math/QR increased slightly from 860 to 864 (Exhibit 22). The number of dropped enrollments for returning students who had not previously taken a Math/QR course increased by 41.5% from 200 in Fall 2018 to 283 in Fall 2019. The drop rate for these students increased from 14.5% in Fall 2018 to 18.9% in Fall 2019. This 4.4 percentage point increase was large enough to be statistically significant ($X^2 = 10.16$, p = .001), indicating that it was not due to semester-to-semester fluctuation. Across the five Essential Topics courses, the average number of transfer-level drops was 3.4 students per Essential Topics section, with the highest average being 6.3 for MATH017E (Exhibit 23).

[15] This count includes all Mathematics and quantitative reasoning courses except MATH049 (Introduction to MESA), which is neither a graduation requirement nor on a path to a graduation requirement.

Exhibit 22) Drops from Math/QR Courses

Group	Fall 2018 Count	Fall 2019 Count	Difference #	Difference %
No Previous Enrollment	245	240	-5	-2.0%
Previous Enrollment with No Math/QR	200	283	83	41.5%
Previous Enrollment with Math/QR	615	624	9	1.5%
Total	1,060	1,147	87	8.2%

Exhibit 23) Dropped Enrollments by Students in Essential Topics Courses

Essential Topics	# Drops	# Sections	Ratio
MATH013E	29	9	3.2
MATH015E	13	5	2.6
MATH016E	12	4	3.0
MATH017E	19	3	6.3
MATH018E	1	1	1.0
Total	74	22	3.4

Level of Support

The seventh research question addressed the success rates in courses with an Essential Topics section: *How did the success rates for students requiring Essential Topics courses compare to those who did not?* During Fall 2019, first-time Math/QR students taking a transfer-level course without being required to take an Essential Topics course had the same overall success rate as those required to take an Essential Topics course (Exhibit 24). At the course level, there were small differences in transfer-level success rates between first-time Math/QR students who did not have an Essential Topics course and those who did. The one exception was MATH180, with first-time Math/QR students taking MATH018E having a success rate 28.0 percentage points below that of students not taking MATH018E. Tempering this result is the low number of first-time Math/QR students in MATH018E, 13. Chi-square analysis indicated that none of these differences was statistically significant. A notable finding was that 41% of students enrolled in an Essential Topics section were not first-time Math/QR students.

Exhibit 24) Course-Level Success Rates for Students With or Without an Essential Topics Section

Course	No Support	Essentials	Difference
MATH130	39.0%	39.9%	0.9% points
MATH150	50.0%	51.8%	1.8% points
MATH160	50.7%	48.7%	-1.9% points
MATH175	38.7%	34.1%	-4.5% points
MATH180	58.8%	30.8%	-28.1% points
Total	41.8%	41.8%	0.0% points

Implementation Factors

Implementation is the focus for the eighth research question on transfer-level Math/QR: *What implementation factors could influence the results?* An obvious factor is the range in success rates across sections of transfer-level Math/QR. Exhibit 25 displays the range of success rates for all students in each transfer-level Math/QR courses with three of more sections in Fall 2019. For most of these courses, the

highest section-level success rate was less than twice that of the lowest. The largest difference was in MATH130, for which the highest section-level success rate (92.9%) was 9.6 times the lowest rate (9.7%).

Exhibit 25) Range of Section-Level Success Rates by Course

Course	# Sections	Minimum Success Rate	Maximum Success Rate
MATH130	40	9.7%	92.9%
MATH150	9	40.7%	80.0%
MATH160	10	33.3%	71.9%
MATH175	11	30.0%	51.2%
MATH180	6	38.9%	64.7%
MATH190	5	39.1%	45.8%
MATH191	3	44.7%	71.4%
PSY190	3	71.4%	89.1%

The broad range of success rates across Math/QR sections, especially for MATH130, raises questions of dispersion or the extent to which the extreme success rates are representative of the sections as a group. For example, are the sections with 9.7% and 92.9% success rates statistical outliers (with other sections tightly clustered around the average success rate)? Or, are the section-level success rates spread somewhat evenly between 26.9% and 92.9%? The statistic designed to address these questions is the standard deviation.

The standard deviation is a measure of dispersion or how spread out the numbers are. The smaller the standard deviation, the more the individual cases are clustered close to the mean (average). A larger standard deviation indicates that the individual cases are spread more widely across the range. On a bell curve, about 68% of the sections would be within one standard deviation from the mean and about 95% would be within two standard deviations. Almost 100% of the sections would be within three standard deviations and cases more than three standard deviations from the mean can be considered outliers.

Exhibit 26 provides basic statistics on the central tendencies (typical section-level success rates) and dispersion of those success rates for the 40 sections of MATH130 in Fall 2019.[16] The mean (or average) success rate was 46.4% and the median (the mid-point) was 41.8%. The standard deviation and range indicate broad dispersion of success rates.

Exhibit 26) Success Rates for MATH130 in Fall 2019

Mean	46.4%
Standard Deviation	22.6%
Median	41.8%
Minimum	9.7%
Maximum	92.9%
Range	83.2%
Number of Sections	40

[16] MATH130 has the most sections in transfer-level Math/QR and approximately half of all enrollments for transfer-level Mathematics. Due to the large number of sections, it is the best Math/QR example for dispersion analysis.

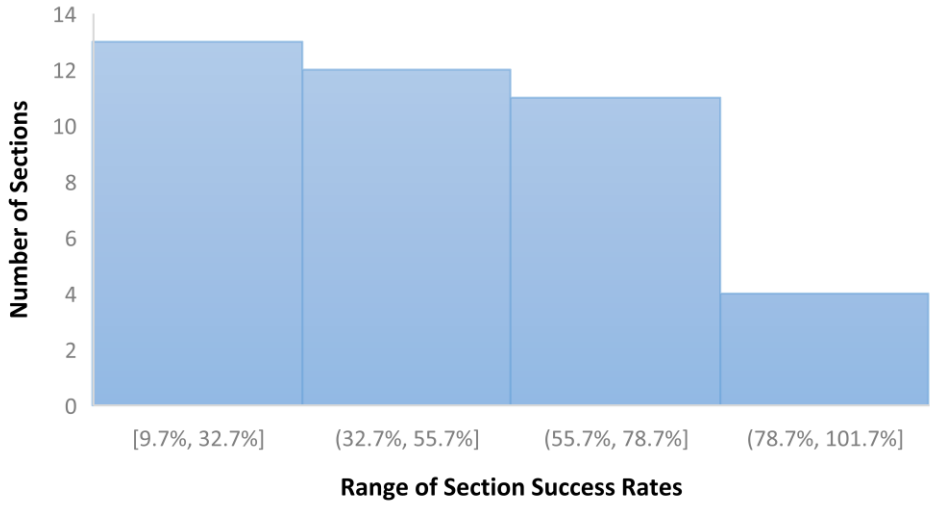
Exhibit 27 displays a breakdown of the 40 sections by their distance from the mean. Only one section was more than two standard deviations from the mean. At 92.9%, that section was well within three standard deviations (114.3%). Both analysis by standard deviation and Tukey's fences (based on the interquartile range) indicate that none of these section's success rates was a statistical outlier.

Exhibit 27) Dispersion of Section Success Rates by Mean & Standard Deviation

Group	Range	Sections
More than 2 SD Below the Mean	0.0 - 1.2%	0
Between 1 SD & 2 SD Below the Mean	1.2 - 23.8%	5
Between the Mean & 1 SD Below the Mean	23.8 - 46.4%	18
Between the Mean & 1 SD Above the Mean	46.4 - 69.0%	9
Between 1 SD & 2 SD Above the Mean	69.0 -91.7%	7
More than 2 SD Above the Mean	91.7% - 100.0%	1

Exhibit 28 visually depicts the distribution of section success rates. Consistent with Exhibit 27 and the median being below the mean, this figure shows that the majority of sections had success rates below the mean of 46.4%.

Exhibit 28) Histogram of MATH130 Success Rates



Further exploration of results for MATH130 indicates that in Fall 2018 and Fall 2019, the course accounted for more than half of the 'D', 'F', and 'W' marks in transfer-level MATH department courses (Exhibit 29). Additionally, success rates for first-time Math/QR students taking MATH130 have been substantially below those for the college's other statistics course—PSY190 (Exhibit 30). The 11.4 percentage point decrease in MATH130 success rate from Fall 2018 to Fall 2019 was large enough to be statistically significant (X^2 = 10.79, p = .001), indicating that the difference was likely not due to chance (Exhibit 31).

Exhibit 29) MATH130 as a Portion of Transfer-Level MATH Enrollment

Category	Fall 2018	Fall 2019	Total
% of Enrollments	53.4%	49.1%	50.5%
% of Successful Completions	52.3%	45.6%	48.2%
% of DFWs	54.7%	51.6%	52.5%

Exhibit 30) Success Rate Comparison: MATH130 and PSY190

Course	Fall 2018	Fall 2019
MATH130	50.6%	39.3%
PSY190	93.8%	85.0%
Difference	43.1% points	45.7% points

Exhibit 31) Success for First-Time MATH130 Students

		Semester		
		Fall 2018	Fall 2019	Total
Success	No	158	348	506
	Yes	162	225	387
	Rate	50.6%	39.3%	43.3%

Summary

Outcomes from the first semester of AB 705 for Math/QR indicated substantial growth in the number of first-time Math/QR students accessing and passing transfer-level Math/QR courses and mixed results in most other areas. First-time Math/QR students' access to transfer-level Math/QR courses increased by 98.7% and throughput (students successfully completing the course) increased by 64.9%. In comparison to Fall 2018, 211 more first-time Math/QR students (including 175 Hispanic/Latinx students) passed a transfer-level Math/QR course.

While the number of first-time Math/QR students passing a transfer-level Math/QR course increased dramatically, there was a notable and statistically significant decline in the success rate, from 52.8% in Fall 2018 to 43.9% in Fall 2019. The overall decrease was 9.0 percentage points with different-sized decreases for different types of Math/QR courses. The type with the smallest decrease was Calculus courses at 4.1 percentage points and the largest decrease was 14.4 percentage points for the type consisting of FIN101, MATH140, and PSY190. Despite this large decrease, these "Other Transfer-Level" courses had the highest success rate of any transfer-level Math/QR type. There was a statistically significant 9.5 percentage point decrease for the type consisting of MATH130, MATH130H, and MATH150, which highlights the importance of attending to reasons for the decreased success rate in MATH130 and the ongoing development of MATH150.

Equity analysis indicated substantial increases in throughput for students who were Hispanic/Latinx, male, and/or below the age of 20. The results showed no new areas of disproportionate impact. The two largest and statistically significant decreases in success rates were for Latino males (12.0 percentage points) and students below the age of 20 (11.2 percentage points). These results, for two of the college's largest demographic groups, highlight the need for careful consideration of AB 705's consequences for specific groups of students as well as the overall student population.

Approximately one-third (34.1%) of the first-time Math/QR students who had a DFW mark in transfer-level Math/QR for Fall 2019 registered for a Math/QR course in Spring 2020. This was somewhat below the percentage (37.9%) of similar students from Fall 2018 who returned to Math/QR in Spring 2019. The students who returned to transfer-level Math/QR in Spring 2019 and stayed past the deadline for dropping had a 46.8% success rate, meaning that only about one in six (17.7%) of first-time students with DFW marks in Fall 2018 successfully completed transfer-level Math/QR the following semester. Both the low percentage of returning students and their resultant success rate indicate an area of attention for planning future AB 705 implementation.

The numbers of students dropping courses increased from Fall 2018 to Fall 2019 for all students in Math/QR (8.2%) and first-time Math/QR students in transfer-level Math/QR (169.2%). With the 98.7% increase in first-time Math/QR student enrollment in transfer-level Math/QR, the drop rate for these students changed from 14.5% in Fall 2018 to 18.6% in Fall 2019. This 4.2 percentage point increase was statistically significant. There were two other groups of students with notably high drop rates in comparison to similar students: returning students without previous Math/QR enrollment and first-time Math/QR students in the MATH017E Essential Topics course. The 4.4 percentage point increase in the drop rate for returning students without previous Math/QR enrollment was statistically significant and might be due to students with lower confidence in Math/QR delaying in the subject.

The Math department offered five Essential Topics courses paired with transfer-level courses. Within the research sample, the success rates for students taking Essential Topics courses and those not taking an Essential Topics course were equal at 41.8%. This result indicates that in Fall 2019 students with lower high school GPAs and an Essential Topics course did just as well as students with higher high school GPAs. The exception was MATH180, in which the success rate for students in the Essential Topics course was approximately half of that for students who did not take the Essential Topics course. Although representing a small number of students and not statistically significant, this finding is worthy of review after the Spring 2020 semester.

Analysis of implementation factors focused on MATH130 (Statistics), the Math/QR course with by far the largest enrollment. The 40 sections of this course had a broad range of success rates, from 9.7% to 92.9%. Based on two statistical tests, none of these sections could be considered an outlier. MATH130 had 49.1% of the transfer-level MATH department enrollments in Fall 2019 and 51.6% of unsuccessful marks (‘D’, ‘F’, or ‘W’). Fall 2018 and Fall 2019 success rates for first-time Math/QR students in PSY190 (Statistics for the Behavioral Sciences) were approximately twice as high as those for MATH130, presenting an important issue for one of the college’s fastest growing courses.

Students in Both Transfer-Level English and Math/QR

AB 705 Implementation at Rio Hondo College

The California Community Colleges Chancellor's Office (CCCCO) provided detailed guidelines for implementing AB 705 within disciplines, such as English and Math/QR. Consistent with the CCCCO guidelines, RHC's implementation focused on individual disciplines. There were no articulated guidelines for students taking both transfer-level English and Math/QR in the same semester. That led to the ninth research question: *What were the results for students taking both transfer-level English and Math/QR?*

Among the 2,571 students in the Fall 2019 sample for this report, 704 (27.4%) took both ENGL101 and a transfer-level Math/QR course as a first-time student in both of those disciplines (Exhibit 32). Among the others, there were 1,349 (52.5%) taking ENGL101 as a first-time ENGL student and 518 (20.1%) taking transfer-level Math/QR as a first-time Math/QR student. The relatively small proportion of students taking both subjects in Fall 2019 could be due to students having already taken a course in one of the subjects but not the other and/or students delaying enrollment in Math/QR.[17]

Exhibit 32: Enrollment by Subject

Subject	Headcount	Percentage
ENGL101 Only	1,349	52.5%
Transfer-Level Math/QR Only	518	20.1%
Both Subjects	704	27.4%
Total	2,571	100.0%

Success Rates

Of the 704 students enrolled in both disciplines, 250 (35.5%) were successful in both courses (Exhibit 33). This was the most common result. Approximately 3 in 10 (29.4%) were unsuccessful in both courses. Based on the 704 students' success rates in ENGL101 and transfer-level Math/QR, the statistical expectation (based on chi-square analysis) would be 26.9% successful in both courses and 20.8% successful in neither.[18] The percentages of students successful in either both or neither were each 8.6% above statistical expectations (statistically significant at $X^2 = 94.17$, $p < .001$), indicating that students choosing to take transfer-level courses in both subjects were more likely to either be successful in both or not be successful in both.

Exhibit 33) Success Rates for Students in Both ENGL101 & Transfer-Level Math/QR

		Success in ENGL101	
		Yes	**No**
Success in Math/QR	**Yes**	35.5% (250)	6.3% (44)
	No	28.8% (203)	29.4% (207)

[17]Consistent with Guided Pathways, students choose Math/QR courses that align with their majors (e.g., psychology students take PSY190, engineering majors take calculus courses). For this reason, counselors can encourage students not to take transfer-level Math/QR in their first semester if they have not chosen a major or area of interest.

[18] The chi-square statistic tests the relationship between two categorical (non-numeric) variables (in Exhibit 33, success in Math/QR and success in ENGL101). It compares the actual counts to the expected counts if there were no relationship between the two variables.

Analysis of success rates for students taking both subjects yielded an interesting difference between ENGL101 and transfer-level Math/QR. Sample students taking ENGL101 with transfer-level Math/QR had a success rate of 64.3%, which was 7.3% higher than the 57.0% for students taking ENGL101 without transfer-level Math/QR. Conversely, students taking transfer-level Math/QR with ENGL101 had a 41.8% success rate, which was 5.0% below the 46.7% for students taking transfer-level Math/QR without ENGL101.

Summary

About 1 in 4 (27.4%) of the students in the sample attempted both ENGL101 and transfer-level Math/QR as a first-time student in both subjects. Slightly more than one-third (35.5%) of these students were successful in both courses. Although a disappointing result, it is higher than the statistical expectation of 26.9% being successful in both.

This section of the report yielded two noteworthy findings. First, students taking courses in both disciplines were more likely to either pass or not pass both courses rather than pass one and not the other. Second, students were more likely to pass ENGL101 when taking that course along with a transfer-level Math/QR course. Both results merit further inquiry to address the extent to which they might be explained by the backgrounds and decisions of these students versus the load of taking transfer-level courses in both disciplines as first-time students in those disciplines.

Conclusion

Rio Hondo College's first semester of implementing AB 705 was successful in fulfilling its primary purpose of increasing the number of students who successfully completed a transfer-level course in English and/or Mathematics/Quantitative Reasoning. In comparison to Fall 2018, an additional 327 first-time English students completed ENGL101 in Fall 2019. This was a 36.5% increase. For transfer-level Math/QR, the increase was 211 students or 64.9%.

These increases were especially large for Hispanic/Latinx students and students below the age of 20. Among Hispanic/Latinx students an additional 283 (35.5%) were successful in ENGL101 and an additional 175 (65.8%) were successful in Math/QR. For students younger than 20, it was 323 (43.2%) more in ENGL101 and 152 (58.2%) in Math/QR.

Beyond these positive results, the picture is less clear. While enrolling and passing substantially more students, ENGL101 maintained its success rate and other results. Transfer-level Math/QR had a large decrease in its overall success rate as well as gaps across groups of courses and students. Both ENGL101 and transfer-level Math/QR continued to have large differences in success rates across sections, which is an important limitation to the analysis in this report and RHC's implementation of AB 705.

Next to throughput (or the numbers of students successfully completing these courses), success rates are an important measure of AB 705 implementation. The success rates for students in the sample decreased by 2.5% to 59.5% for ENGL101 and by 9.0% to 43.9% for Math/QR. The 2.5 percentage point difference for ENGL101 is within the course's typical term-to-term fluctuation in success rates and not statistically significant. The 9.0 percentage point difference for Math/QR was unusually large and statistically significant. For both subjects, these results raise the question of the minimum success rates that can be considered "acceptable" to the faculty and administration.

Although it is too early in AB 705 implementation to examine changes in equity gaps, this report addresses the distribution of year-to-year changes in success rates. That is to say, do the decreases in success rates disproportionately fall on specific groups of students? While there were no year-to-year decreases meeting the criteria for disproportionate impact, the Math/QR decreases for Latino Males (12.0%) and students below age 20 (11.2%) were statistically significant by chi-square analysis. These results are cause for attention and monitoring.

There were two types of students who did not successfully complete these transfer-level courses: those who dropped the course before it was recorded on their transcripts and those who had a 'D', 'F', or 'W' mark. Although the raw numbers of students dropping increased for both subjects, the drop rate was relatively stable in ENGL101. The increase was 4.2 percentage points in Math/QR, which was statistically significant. The increases in students who dropped were almost entirely among new RHC students in ENGL101 and returning students who were taking Math/QR for the first time. Less than one-quarter (23.9%) of the students with a DWF mark in ENGL101 returned for an English course in Spring 2020, which was a statistically significant decrease from 31.4% in Spring 2019. For transfer-level Math/QR, the difference was narrow: 34.1% in Spring 2020 and 37.9% in Spring 2019.

Students required to take Support or Essential Topics courses generally did as well as students with higher high school GPAs who did not have this requirement. The notable exceptions were for ENGL010S and MATH180E.

As noted earlier in this Conclusion, a crucial implementation factor was the range in section success rates for transfer-level courses. In Fall 2019, for all students, the success rates for ENGL101 ranged from 26.9% to 92.9%. For transfer-level Math/QR, the range was 9.7% to 92.9%. These broad ranges are consistent with the data from previous academic years. All questions of successful implementation must be considered in the context of having sections in which students are many times more likely to succeed than in other sections of the same course. In addition to having a broad span of success rates, MATH130 produced more than half of the DFW marks in transfer-level Mathematics courses and had an overall success rate approximately one-half that of its behavioral sciences counterpart—PSY190.

Implications for Implementation of AB 705

Although based on one sample after one semester of AB 705, these results have implications for 2020 and beyond. There are implications for AB 705 implementation and future research. These implications and the relevant parties for implementing them appear in Exhibit 34 and receive explanation below.

Exhibit 34) Implications and Relevant Parties

#	Implications	Relevant Parties							
		Academic Senate	ENGL Faculty	MATH Faculty	Other QR Faculty	Counselors	Academic Support	Administration	IRP Office
1	Conversation on throughput							X	
2	Acceptable success rates	X	X	X	X			X	
3	Acceptable range of success rates	X	X	X	X			X	
4	MATH130 success rate			X			X	X	
5	Future of PSY190				X	X		X	
6	Audience for Essential Topics			X		X			
7	Success rates for ENGL101S/SP students		X						X
8	Support for FIN101, MATH140 & PSY190			X	X		X	X	
9	Success rate for returning students with DFW marks					X	X		X
10	Groups with high drop rates					X	X		
11	Reasons for dropping courses		X	X	X	X			X
12	Which students take Math/QR when and results					X			X
13	Which students should take both subjects at same time					X			X
14	Potential equity gaps In Math/QR			X	X				
15	Equity gap analysis after S20								X
16	One-year throughput rate								X
17	Compare AY19-20 to multiple previous years								X

The first three implications address *success rates and throughput*. For successful implementation of AB 705, the college should attend to both. Throughput (or the number of successful completions) is not as well established and understood on campus as is success rate. The college administration could gain support for AB 705 by continuing the conversation on throughput and promoting the understanding that increased throughput means an increased number of students completing their graduation and transfer requirements. Given the low total success rates and broad range of section-level success rates for many courses in this analysis, an important step would be to continue the conversation initiated by Academic Senate President Kevin Smith on FLEX Day for Spring 2020. The Senate, faculty members in courses affected by AB 705, and academic administrators could advance student success by determining acceptable ranges for section-level success rates of similar courses and the acceptable success rates for general education courses.

The most important step for improving student success under the current structure of AB 705 is addressing the *success rate in MATH130*. Due to its high enrollment and low success rate, this course accounted for approximately one-half of all non-successful marks in transfer-level Math/QR. Consistent with principles of process improvement, the college should start with this course and work on increasing student success. It is the single item in which the college can create the most gain. A related implication would be to consider the feasibility of expanded offerings of contextualized Math/QR courses such as PSY190, a statistics course with about twice the success rate of MATH130. Although this course is designed to serve students majoring in the behavioral and social sciences, instructors and counselors could consider its applicability to additional areas of interest and/or the creation of contextualized statistics courses in other academic divisions.

Three additional implications address *support structures for these courses*. Approximately 4 in 10 (41%) of students in MATH Essential Topics courses were not taking a Math/QR course for the first time. Establishing the intended audience for these courses and appropriate advisement could help to sharpen the focus on which students these courses support. Due to the range of section-level success rates in ENGL101, the analysis was inconclusive on the seriousness of the success rate gaps between students not taking support courses and those taking ENGL010S or ENGL101SP. With the support of Institutional Research and Planning (IRP), English faculty should explore and work to close the success rate gap between these groups of students. Additionally, three Math/QR courses (FIN101, MATH140, PSY190) have no support courses and limited support through the MSC and LAC. Appropriate support structures could be vital to the long-term viability of these courses as AB 705 solutions.

Students who were not successful in these courses are the focus of three implications. The increasing enrollment and decreasing success rates in these courses mean a substantial increase in the numbers of students taking 'D', 'F', or 'W' marks for the course. For AB 705 to work according to plan, these students would need to return in the next semester to pass the course (or in Math/QR perhaps another transfer-level course). For Spring 2019 and 2020, approximately one-third of the sample students with a DFW in Fall returned for a course in the same subject and not all returned to a transfer-level course. Spring 2019 success rates for students returning to transfer-level courses were below 50% in both ENGL101 and Math/QR. This means that fewer than one-sixth of the unsuccessful students were successful in the following semester. This issue deserves a collaborative response across several units of the college. Analysis of dropped enrollments indicated that the group of students most likely to drop ENGL101 was a different group from those most likely to drop transfer-level Math/QR. Should these results hold in Spring 2020, counselors and support services could develop focused strategies for meeting the needs of these student populations. The college does not have systemic information on

which students drop these courses and their reasons for dropping. AB 705 implementation could benefit from an evidence-based approach to addressing and preventing dropped enrollments.

Student *choices on when to take which subjects* influence the results of AB 705 implementation. Because transfer-level Math/QR courses are based on career plans and areas of interest, counselors have encouraged some students to wait on taking Math/QR until they have decided on a pathway. Analysis at the end of the academic year can compare the results for Fall 2019 and Spring 2020 to offer insights into the outcomes of this strategy. Analysis of results for sample students taking both ENGL101 and transfer-level Math/QR in Fall 2019 indicated that some types of students may do better in this course pattern than others do and that taking both in the same semester could lead to extreme results (i.e., passing both or passing neither). Additional research on student results and counselors' advisement practices could illuminate the value of when to take which courses.

Equity gaps are a central concern for AB 705 implementation. There are two implications related to this topic. The first of these is for Math/QR faculty to note and discuss reasons that success rates for Latino Males and students below age 20 had a larger decrease than those for other groups. Although those gaps were only for one semester, the practice of considering equity gaps could serve both these students and the faculty. One year of AB 705 implementation will provide sufficient data to start analysis of changes in equity gaps for students completing transfer-level English and Math/QR in their first year of college. IRP could answer important questions on campus by comparing the gaps before and after the first year of implementation.

The ultimate measure of AB 705 implementation is the *one-year throughput rate* for new students' successful completion of transfer-level English and Math/QR. Analysis after Spring 2020 can address changes in this rate, which will address both the success count and concerns about student success rates. The current report compares the college's first semester of the AB 705 implementation with one previous semester. The end-of-year analysis should take a more rigorous approach by considering the 2019-20 results in the context of multiple previous years. Year-to-year changes could be a function of larger trends and not necessarily AB 705.

Appendix A:

Rio Hondo College Corequisite and Placement Guidelines (Fall 2019)

RIO HONDO COLLEGE ● PLACEMENT BEGINNING FALL 2019

NOTE: ASK STUDENT IF AP EXAMS WERE TAKEN

ENGLISH

High School Performance Metric	English	Required Co-Requisite	SOATEST CODE	Units
≥ 2.6	**English 101** (3.5)	None	**HS01**	**3.5**
2.5 – 1.9	**English 101** (3.5)	**Required: English 10S** (1)	**E10S**	**4.5**
≤ 1.8	**English 101** (3.5)	**Required: English 10SP** (2)	**E10SP**	**5.5**

OTHER ENGLISH

Any Course with ENGL 101 Pre-Requisite	**CC03**

READING (REQUIRED ONLY FOR STUDENTS FOLLOWING THE LOCAL RHC GE PATTERN)

High School Performance Metric	Reading	Required Co-Requisite	SOATEST CODE	Units
≥ 2.5	**READ 101** (3.0)	None	**HS02**	**3.0**
2.49 – 2.0	**READ 043** (3.0)	None	**HS23**	**3.0**
≤ 1.9	**READ 022** (3.0)	**Required: READ 022L** (1)	**HS22**	**3.0**

ENLA

High School Performance Metric	ENLA	Required Co-Requisite	SOATEST CODE	Units
≥ 2.4	**ENLA 100** (3.0)	None	**HS00**	**3.0**
2.3 – 2.0	**ENLA 034** (3.0)	None	**HS34**	**3.0**
≤ 1.9	**ENLA 024** (3.0)	None	**HS24**	**3.0**

RIO HONDO COLLEGE ● PLACEMENT BEGINNING FALL 2019

NOTE: ASK STUDENT IF AP EXAMS WERE TAKEN

MATH ● STATISTICS/LIBERAL ARTS MATHEMATICS

High School Performance Metric	Math	Recommended or Required Co-Requisite	SOATEST CODE	Units
≥ 3.0	**Math 130: Statistics** (4) **Math 140: Math for Elem. Ed.** (4) **Math 150: QR in Today's World** (3)	None	**M45**	**4** **4** **3**
2.9 - 2.3	**Math 130: Statistics** (4) **Math 140: Math for Elem. Ed.** (4) **Math 150: QR in Today's World** (3)	**Recommended: Math 13E** (1) or Supplemental Instruction [w/ coreq of Math 130) None **Recommended: Math 15E** (2) or Supplemental Instruction [w/ coreq of Math 150]	**M45**	**4/5** **4** **3/5**
≤ 2.2	**Math 130: Statistics** (4) **Math 140: Math for Elem. Ed.** (4) **Math 150: QR in Today's World** (3)	**Required: Math 13E** (1) None **Required: Math 15E** (2)	**M13E** **M15E**	**5** **4** **5**

High School Performance Metric	Math	Required Co-Requisite	SOATEST CODE	Units
n/a	**PSY 190** (4)	none	**n/a**	**4**
TBD	**FIN 101**	TBD	**TBD**	

RIO HONDO COLLEGE ● PLACEMENT BEGINNING FALL 2019

NOTE: ASK STUDENT IF AP EXAMS WERE TAKEN

MATH ● BSTEM MATHEMATICS

High School Performance Metric	Math	Recommended or Required Co-Requisite	SOATEST CODE	Units
≥ 3.4 **OR** **≥ 2.6 and enrolled in HS Calculus**	**Math 160: College Algebra** (4) **Math 175: Plane Trig** (3)	None	**M-STEM**	**4** **3**
3.3-2.6 **OR** **Enrolled in HS Calculus**	**Math 160: College Algebra** (4) **Math 175: Plane Trig** (3)	**Recommended: Math 16E** (1) or Supplemental Instruction **Recommended: Math 17E** (1) or Supplemental Instruction	**M-STEM**	**4/5** **3/4**
≤ 2.5	**Math 160: College Algebra** (4) **Math 175: Plane Trig** (3)	**Required: Math 16E** (1) **Required: Math 17E** (1)	**M16E** **M17E**	**5** **4**
HIGHER LEVEL MATH COURSES				
High School Performance Metrics	**Math**	**Recommended or Required Co-Requisite**	**SOATEST CODE**	**Units**
≥ 3.3 & Plane Trig or Math Analysis -or- **≥ 3.3 & Calculus**	**Math 170: Elements of Calculus** (4)	None	**M170**	**4**
≥ 3.3 & Plane Trig or Math Analysis -or- **≥ 3.3 & HS Calculus**	**Math 180: Pre-Calculus** (4)	None	**HS18**	**4**
3.2 - 2.6 & Plane Trig or Math Analysis or HS Calculus		**Recommended: M18E (1)**	**HS18**	
≤2.5 & Plane Trig or Math Analysis or HS Calculus		**Required: Math 18E** (1)	**M18E**	
≥ 3.1 & enrolled in HS Calculus -or- **≥ 3.5 & Pre-Calculus or Plane Trig**	**Math 190: Calculus I** (4)	None	**HS19**	**4**