2014 Post-Implementation Prerequisite Validation Studies

Part I: Examination of the Effectiveness of Current Prerequisites in Biology, Journalism, Microbiology, Psychology, and Theater Arts

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Examination of the Effectiveness of Current Prerequisites

Introduction

Title 5 Education Code requires that interdisciplinary course prerequisites are reviewed every six years [§ 55003(b)(4)]. In addition to examining the impact of the prerequisite, the college is also required to examine disproportionate impact [§ 55003 (g)(2)]. Title 5 [§ 55502 (e)] defines disproportionate impact as occurring "...when the percentage of persons from a particular racial, ethnic, gender, age or disability group who are directed to a particular service or placement based on an assessment instrument, method, or procedure is significantly different from the representation of that group in the population of persons being assessed, and that discrepancy is not justified by empirical evidence demonstrating that the assessment instrument, method or procedure is a valid and reliable predictor of performance in the relevant educational setting."

The Crafton Hills College (CHC) Office of Institutional Effectiveness, Research, and Planning (OIERP) is in the process of examining the effectiveness of prerequisites that have been implemented from fall 2000 to fall 2013. Part I examines the effectiveness of course prerequisites for the following target courses:

Table 1: Part I Target Courses, Course Title, Current Prerequisites, and Term Prerequisites were implemented.

Target Course	Target Course Title	Current Prerequisite	Term Implemented
BIOL-130	Cell and Molecular Biology	CHEM-101 or 150 & MATH-095	2005FA
BIOL-131	Populations and Organisms	MATH-095/C	2005FA
JOUR-120	Fundamentals of News Writing	ENGL-010/015	2009FA
MICRO-150	Medical Microbiology	CHEM-101or 150	1996FA (CHEM-101) 2011FA (CHEM-101 or 150)
PSYCH-108	Statistics	MATH-095/C	2007FA
THART-226	Play and Screenplay Analysis	ENGL-010/015	2008FA

Part II will examine the effectiveness of course prerequisites for the following target courses and the research for Part II will be illustrated in a second report:

Table 2: Part II Target Courses, Course Title, Current Prerequisites, and Term Prerequisites were implemented.

Target Course	Target Course Title	Current Prerequisite	Term Implemented
CHEM-101	Introduction to Chemistry	MATH-090/C	2000FA
CHEM-150	General Chemistry I	MATH-095/C	2000FA
PHYSIC-110	General Physics I	MATH-103 or Eligibility for 160	2011FA
PHYSIC-200	Physics I	MATH-250	2005FA
PHYSIC-201	Physics II	PHYSIC-200 and MATH-251	2000FA
PHYSIC-250	College Physics I	MATH-250	2012FA

Summary of Results

1. Did the target course success rates increase after the prerequisites were implemented?

   The success rates increased after the prerequisite was implemented for five of the seven target courses examined. JOUR-120 did not have enough enrollments to compare the success rates pre- and post-implementation of the prerequisite. The only decrease in the target course success rate occurred in MICRO-150 when the option of successfully completing CHEM-150 was added to the CHEM-101 prerequisite.

Target Course	Increase	Substantial	Significant
BIOL-130	Yes	Yes	Yes
BIOL-131	Yes	Yes	Yes
JOUR-120	NA	NA	NA
MICRO-150 (CHEM-101)	Yes	No	Yes
MICRO-150 (CHEM-101 or 150)	No	Yes	Yes
PSYCH-108	Yes	No	No
THART-226	Yes	Yes	No

Note: **Increase** refers to whether or not there was an increase in the target course success rate, **substantial** refers to whether or not the change in the target course success rate had an effect size that was .20 or higher, and **significant** refers to a statistically significant ($p < .05$) change in the target course success rate from pre- to post-implementation of the prerequisite(s).

2. What is the racial/age/gender/disability makeup of the course post implementation compared to pre implementation?

   a. One of the most common findings across the target courses was that there was an increase in the proportion of Hispanic student's post-implementation than pre-implementation, which mirrors the increase in the proportion of Hispanic student's campus wide at Crafton.

3. Does the increased success of students in each protected category support the implementation if indeed the percentages of students in each group have changed?

a. Yes, in general, female students, African American Students, Hispanic Students, Native American Students, students 20 years old or younger, and students identified with a disability were substantially (ES >= .20) and statistically significantly ($p < .05$) more likely to successfully complete the target course if they had met the prerequisite than students who had not met the prerequisite.

b. The only target course of concern is MICRO-150 because there was a decrease in the success rate after changing the prerequisite from CHEM-101 to CHEM-101 or CHEM-150.

4. Was there disproportionate impact?

    a. No, disproportionate impact was not indicated for any of the target courses.

5. What effect did the implementation have on overall course enrollment?

    a. The overall course enrollment in BIOL-130 and PSYCH-108 increased after the implementation of the prerequisites for each course.

    b. There was a slight decline in enrollments for BIOL-131 and the decrease in enrollments for MICRO-150 mirrored the decline in enrollments campus wide.

    c. The decline in enrollments for JOUR-120 and THART-226 is most likely a result of the unique nature of each course, writing for the school newspaper and writing screen plays.

Possible Implications

The results presented here support keeping the prerequisites in place for each of the six target courses with one exception. Namely, the target course success rates increased after the prerequisite was implemented for each of the target courses except when CHEM-150 was added as an option for students along with CHEM-101 as the prerequisite for MICRO-150. Adding the CHEM-101 prerequisite for MICRO-150 statistically significantly ($p = .027$) increased the likelihood that students would successfully complete MICRO-150 from 69% to 75%. However, when the option of successfully completing CHEM-101 or CHEM-150 was added as the prerequisite to MICRO-150 the success rate statistically significantly ($p < .001$) and substantially (ES = -.27) decreased from 77% to 65%, indicating that CHEM-150 does not increase the likelihood that students will successfully complete MICRO-150. CHEM-150 is General Chemistry I and is the first semester in a year-long general chemistry sequence. Perhaps CHEM-150 and CHEM-151 need to be required as the prerequisite option because of the possibility that everything covered in CHEM-150 does not sufficiently prepare students for MICRO-150. **Based on the research illustrated here,**

the CHC Office of Institutional Effectiveness, Research and Planning recommends that the microbiology instructors consider either removing CHEM-150 as an optional prerequisite for MICRO-150 or explore adding CHEM-151 as a prerequisite.

Findings

Question 1: Did the target course success rates increase after the prerequisite was implemented?

One of the main concerns after implementing a prerequisite for a target course is whether the students who were required to meet the prerequisite had an increased likelihood of successfully completing the target course. The target course prerequisites have been in place for different periods of time, and, as a result, the time frame for examining the success rate prior to the prerequisite varied for each target course. If the time frame post-implementation occurred five years or less from the current complete year (i.e. 2013-2014), then the same amount of time post-implementation was matched with the pre-implementation time frame. As an illustration, the prerequisite for MICRO-150 was implemented in Fall 2011. The time from Fall 2011 to the current complete year was three years; therefore, the pre-implementation time frame in which the post-implementation success rate was compared to, was also three years. If the pre-requisite was implemented six or more years from the most recent complete year (i.e. 2013-2014) then the time frame pre-implementation was only the three most recent years to help control for recency of the curriculum. In addition, only students enrolled in the target courses in primary terms (i.e. fall and spring) were included in the study to control for higher success rates in summer semesters, which are most likely a result of the type of student who chooses to enroll in summer courses.

Table 3: Target Courses, Term Prerequisite Established, and Time Frame Examined Pre- and Post-Implementation.

Target Course	Prerequisite Course	Term Prerequisite Established	Time Frame Pre-Implementation	Time Frame Post-Implementation
BIOL-130	CHEM-101 or 150 & MATH-095	2005FA	2002-03 to 2004-05	2005-06 to 2013-14
BIOL-131	MATH-095/C	2005FA	2002-03 to 2004-05	2005-06 to 2013-14
JOUR-120	ENGL-010/015	2009FA	2004-05 to 2008-09	2009-10 to 2013-14
MICRO-150	CHEM-101	1996FA	1993-94 to 1995-96	1996-97 to 2010-11
MICRO-150	CHEM-101or 150	2011FA	2008-09 to 2010-11	2011-12 to 2013-14
PSYCH-108	MATH-095/C	2007FA	2004-05 to 2006-07	2007-08 to 2013-14
THART-226	ENGL-010/015	2008FA	2005-06 to 2007-08	2008-09 to 2013-14

The performance of the students who earned a GOR in the target courses specified in Table 3 post-implementation was compared to students who earned a GOR in the target course pre-implementation in primary terms only. The effect size statistic was used to indicate the size of the difference on course success for students who were required to meet the prerequisite post-implementation and students who earned a grade on record (GOR, A, B, C, D, F, I, NP, P, or W) in

each target course prior to the implementation of the prerequisite. One method of interpreting effect size was developed by Jacob Cohen. Jacob Cohen defined "small," "medium," and "large" effect sizes. He explained that an effect size of .20 can be considered small, an effect size of .50 can be considered medium, and an effect size of .80 can be considered large. An effect size is considered to be meaningful if it is .20 or higher. It is important to mention that the number of students in each group does not influence Effect Size; whereas, when statistical significance is calculated, the number of students in each group does influence the significance level (i.e. "p" value being lower than .05).

Referring to Table 3A, students who were required to complete the prerequisites for BIOL-130 and 131 were statistically significantly ($p < .01$) and substantially (ES >= .39) more likely to successfully complete BIOL-130 (80%) and BIOL-131 (72%) than students who were not required to complete the prerequisite for BIOL-130 (63%) and BIOL-131 (54%). When looking at JOUR-120 there were not enough students who enrolled in the course to conduct an analysis. The class, Fundamentals of News Writing, has only been offered intermittently in the last five years, and when it is offered only a small number of students enroll in the course.

Medical Microbiology (MICRO-150) originally had the prerequisite of CHEM-101 established in the fall of 1996 (see Table 3). The option of successfully completing CHEM-101 or CHEM-150 prior to enrolling in MIRCO-150 was added in Fall 2011. Students required to successfully complete CHEM-101 prior to taking MICRO-150 were statistically significantly ($p < .05$) more likely to successfully complete MICRO-150 (75%) than students who were not required to successfully complete CHEM-101 (69%). The additional option of successfully completing CHEM-150 was also examined (see Table 3A). Specifically, students who had the option of successfully completing CHEM-101 or 150 were statistically significantly ($p < .001$) and substantially (ES = -.27) less likely to successfully complete MICRO-150 (65%) than students who were required to successfully complete CHEM-101 (77%). In addition, the MICRO-150 success rate of 65% is lower than the success rate prior to the implementation of the CHEM-101 prerequisite, 69%.

PSYCH-108, Statistics, is a cross-listed class with MATH-108. A cross-listed course is a course with one set of content, in this case, statistics. Cross-listing allows students to choose whether or not they want to earn credit in different disciplines, in this case students can choose to earn credit in either psychology or mathematics. The limitation to the comparison group (i.e. pre-implementation) is that PSYCH-108 was only offered for one semester and one section without the prerequisite of MATH-095. Students who were required to complete the prerequisite for PSYCH-108 were more likely to successfully complete PSYCH-108 (85%) than students who were not required to complete the prerequisite (81%).

Students required to successfully complete ENGL-010/015 prior to enrolling in THART-226 were substantially (ES = .26) more likely to successfully complete THART-226 (77%) than students who were not required to successfully complete the prerequisite (65%). One limitation is the low number of students enrolling in THART-226, which has only been offered three times in the last three years.

Table 3A: Target Course Success Rates Pre- and Post-Implementation of the Prerequisite Courses.

Target Course	Success Rate							
	Pre-Implementation			Post-Implementation				
	#	N	%	#	N	%	ES	P Value
BIOL-130	40	64	62.5	239	299	79.9	.41	.009
BIOL-131	46	86	53.5	260	362	71.8	.39	.002
JOUR-120	17	22	77.3	4	9	44.4	NA	NA
MICRO-150 (CHEM-101)	206	300	68.7	1,390	1,853	75.0	.14	.027
MICRO-150 (CHEM-101 or 150)	486	632	76.9	343	532	64.5	-.27	< .001
PSYCH-108	29	36	80.6	373	439	85.0	.12	.527
THART-226	34	52	65.4	34	44	77.3	.26	.206

Note: JOUR-120 was only offered once in the last six years and there are not enough students to make a valid comparison. The first time that PSYCH-108 was offered was in 2006-2007, accordingly, only one comparison year pre-implementation was available.

Question 2: What is the racial/age/gender/disability makeup of the course post implementation compared to pre implementation?

Proportionally, gender, ethnicity, age, and disability were not statistically significantly ($p < .05$) lower from pre-implementation to post-implementation of the prerequisite for BIOL-130, BIOL-131, JOUR-120, and PSYCH-108 (see Tables 4 – 4E). There was a statistically significantly ($p < .05$) higher proportion of students for the following target course demographics:

- A higher proportion of Hispanic students (28%) enrolled in BIOL-131 after the prerequisite was implemented than prior to when the prerequisite was implemented (16%, see Table 4A)
- A higher proportion of Hispanic students (24%) enrolled in MICRO-150 after the CHEM-101 prerequisite was implemented than prior to when the prerequisite was implemented (15%, see Table 4C)
- A higher proportion of male students (31%) enrolled in MICRO-150 after the CHEM-101 or CHEM-150 prerequisite was implemented than prior to when the prerequisite was implemented (25%, see Table 4C.1)
- A higher proportion of Hispanic students (34%) enrolled in MICRO-150 after the CHEM-101 or CHEM-150 prerequisite was implemented than prior to when the prerequisite was implemented (26%, see Table 4C.1)
- A higher proportion of students 20 – 24 years old (48%) enrolled in MICRO-150 after the CHEM-101 or CHEM-150 prerequisite was implemented than prior to when the prerequisite was implemented (40%, see Table 4C.1)
- A higher proportion of Hispanic students (31%) enrolled in PSYCH-108 after the prerequisite was implemented than prior to when the prerequisite was implemented (14%, see Table 4D)
- A higher proportion of Hispanic students (36%) enrolled in THART-226 after the prerequisite was implemented than prior to when the prerequisite was implemented (10%, see Table 4E)
- A higher proportion of students 20 – 24 years old (50%) enrolled in THART-226 after the prerequisite was implemented than prior to when the prerequisite was implemented (29%, see Table 4E)

The increase in the proportion of Hispanic students mirrors the increase in the proportion of Hispanic student's campus wide, which has increased every year for the last ten years.

There were also statistically significant ($p < .05$) lower proportions of students for the following target course demographics:

- A lower proportion of Caucasian students (50%) enrolled in MICRO-150 after the CHEM-101 prerequisite was implemented than prior to when the prerequisite was implemented (62%, see Table 4C)
- A lower proportion of students 30 – 34 year olds (11%) enrolled in MICRO-150 after the CHEM-101 prerequisite was implemented than prior to when the prerequisite was implemented (17%, see Table 4C)
- A lower proportion of students 25 – 29 year olds (17%) enrolled in MICRO-150 after the CHEM-101 or CHEM-150 prerequisite was implemented than prior to when the prerequisite was implemented (22%, see Table 4C.1)
- A lower proportion of Caucasian students (46%) enrolled in THART-226 after the prerequisite was implemented than prior to when the prerequisite was implemented (71%, see Table 4E)

Table 4: Gender, Ethnicity, Age, and Disability Status Pre- and Post-Implementation of CHEM-101 or 150 and MATH-095 as the Prerequisites to BIOL-130.

Demographic Characteristics	Pre-Implementation		Post-Implementation		Total	
	#	N	%	#	N	%
Gender						
Female	36	56.3	149	49.8	185	51.0
Male	27	42.2	149	49.8	176	48.5
Unknown	1	1.6	1	0.3	2	0.6
Total	**64**	**100.0**	**299**	**100.0**	**363**	**100.0**
Ethnicity						
Asian	12	18.8	34	11.4	46	12.7
African American	4	6.3	24	8.0	28	7.7
Hispanic	14	21.9	82	27.4	96	26.4
Native American	3	4.7	4	1.3	7	1.9
Caucasian	26	40.6	146	48.8	172	47.4
Unknown	5	7.8	9	3.0	14	3.9
Total	**64**	**100.0**	**299**	**100.0**	**363**	**100.0**
Age						
19 or younger	10	15.6	61	20.4	71	19.6
20-24	38	59.4	150	50.2	188	51.8
25-29	8	12.5	54	18.1	62	17.1
30-34	1	1.6	20	6.7	21	5.8
35-39	2	3.1	4	1.3	6	1.7
40-49	5	7.8	10	3.3	15	4.1
50 or older	0	0.0	0	0.0	0	0.0
Total	**64**	**100.0**	**299**	**100.0**	**363**	**100.0**
Disability Status						
Not a DSPS Student	62	96.9	292	97.7	354	97.5
DSPS Student	2	3.1	7	2.3	9	2.5
Total	**64**	**100.0**	**299**	**100.0**	**363**	**100.0**

Table 4A: Gender, Ethnicity, Age, and Disability Status Pre- and Post-Implementation of MATH-095 as the Prerequisite to BIOL-131.

Demographic Characteristics	Pre-Implementation		Post-Implementation		Total	
	#	N	%	#	N	%
Gender						
Female	52	60.5	186	51.4	238	53.1
Male	33	38.4	175	48.3	208	46.4
Unknown	1	1.2	1	0.3	2	0.4
Total	**86**	**100.0**	**362**	**100.0**	**448**	**100.0**
Ethnicity						
Asian	8	9.3	52	14.4	60	13.4
African American	10	11.6	29	8.0	39	8.7
Hispanic	14	16.3[a]	101	27.9[a]	115	25.7
Native American	1	1.2	6	1.7	7	1.6
Caucasian	48	55.8	169	46.7	217	48.4
Unknown	5	5.8	5	1.4	10	2.2
Total	**86**	**100.0**	**362**	**100.0**	**448**	**100.0**
Age						
19 or younger	23	26.7	103	28.5	126	28.1
20-24	46	53.5	176	48.6	222	49.6
25-29	9	10.5	55	15.2	64	14.3
30-34	1	1.2	11	3.0	12	2.7
35-39	2	2.3	6	1.7	8	1.8
40-49	5	5.8	9	2.5	14	3.1
50 or older	0	0.0	2	0.6	2	0.4
Total	**86**	**100.0**	**362**	**100.0**	**448**	**100.0**
Disability Status						
Not a DSPS Student	83	96.5	354	97.8	437	97.5
DSPS Student	3	3.5	8	2.2	11	2.5
Total	**86**	**100.0**	**362**	**100.0**	**448**	**100.0**

a – The proportion of Hispanic students was statistically significantly ($p < .05$) higher post-implementation (27.9%) than pre-implementation (16.3%) of the prerequisite.

Table 4B: Gender, Ethnicity, Age, and Disability Status Pre- and Post-Implementation of ENGL-010/015 as the Prerequisite to JOUR-120.

Demographic Characteristics	Pre-Implementation		Post-Implementation		Total	
	#	N	%	#	N	%
Gender						
Female	13	59.1	2	22.2	15	48.4
Male	9	40.9	7	77.8	16	51.6
Unknown	0	0.0	0	0.0	0	0.0
Total	**22**	**100.0**	**9**	**100.0**	**31**	**100.0**
Ethnicity						
Asian	4	18.2	1	11.1	5	16.1
African American	1	4.5	1	11.1	2	6.5
Hispanic	3	13.6	4	44.4	7	22.6
Native American	0	0.0	0	0.0	0	0.0
Caucasian	13	59.1	3	33.3	16	51.6
Unknown	1	4.5	0	0.0	1	3.2
Total	**22**	**100.0**	**9**	**100.0**	**31**	**100.0**
Age						
19 or younger	8	36.4	4	44.4	12	38.7
20-24	10	45.5	5	55.6	15	48.4
25-29	4	18.2	0	0.0	4	12.9
30-34	0	0.0	0	0.0	0	0.0
35-39	0	0.0	0	0.0	0	0.0
40-49	0	0.0	0	0.0	0	0.0
50 or older	0	0.0	0	0.0	0	0.0
Total	**22**	**100.0**	**9**	**100.0**	**31**	**100.0**
Disability Status						
Not a DSPS Student	22	100.0	9	100.0	31	100.0
DSPS Student	0	0.0	0	0.0	0	0.0
Total	**22**	**100.0**	**9**	**100.0**	**31**	**100.0**

Table 4C: Gender, Ethnicity, Age, and Disability Status Pre- and Post-Implementation of CHEM-101 as the Prerequisite to MICRO-150.

Demographic Characteristics	Pre-Implementation		Post-Implementation		Total	
	#	N	%	#	N	%
Gender						
Female	227	75.7	1417	76.5	1644	76.4
Male	73	24.3	434	23.4	507	23.5
Unknown	0	0.0	2	.1	2	.1
Total	300	100.0	1853	100.0	2153	100.0
Ethnicity						
Asian	22	7.3	169	9.1	191	8.9
African American	33	11.0	235	12.7	268	12.4
Hispanic	46	15.3[a]	450	24.3 [a]	496	23.0
Native American	4	1.3	23	1.2	27	1.3
Caucasian	185	61.7[b]	925	49.9[b]	1110	51.6
Unknown	10	3.3	51	2.8	61	2.8
Total	300	100.0	1853	100.0	2153	100.0
Age						
19 or younger	37	12.3	197	10.6	234	10.9
20-24	98	32.7[c]	725	39.1[c]	823	38.2
25-29	49	16.3	361	19.5	410	19.0
30-34	52	17.3[d]	208	11.2[d]	260	12.1
35-39	38	12.7	169	9.1	207	9.6
40-49	19	6.3	167	9.0	186	8.6
50 or older	7	2.3	26	1.4	33	1.5
Total	300	100.0	1853	100.0	2153	100.0

Note: Disability status was not examined because it wasn't available prior to fall 1998.

a – The proportion of Hispanic students was statistically significantly ($p < .05$) higher post-implementation (24.3%) than pre-implementation (15.3%) of the prerequisite.

b – The proportion of Caucasian students was statistically significantly ($p < .05$) lower post-implementation (49.9%) than pre-implementation (61.7%) of the prerequisite.

c – The proportion of students 20 – 24 years old was statistically significantly ($p < .05$) higher post-implementation (39.1%) than pre-implementation (32.7%) of the prerequisite.

d – The proportion of students 30 – 34 years old was statistically significantly ($p < .05$) lower post-implementation (11.2%) than pre-implementation (17.3%) of the prerequisite.

Table 4C.1: Gender, Ethnicity, Age, and Disability Status Pre- and Post-Implementation of CHEM-101 or 150 as the Prerequisite to MICRO-150.

Demographic Characteristics	Pre-Implementation		Post-Implementation		Total	
	#	N	%	#	N	%
Gender						
Female	471	74.5	369	69.4	840	72.2
Male	159	25.2[a]	162	30.5[a]	321	27.6
Unknown	2	0.3	1	0.2	3	0.3
Total	**632**	**100.0**	**532**	**100.0**	**1164**	**100.0**
Ethnicity						
Asian	67	10.6	57	10.7	124	10.7
African American	81	12.8	52	9.8	133	11.4
Hispanic	167	26.4[b]	179	33.6[b]	346	29.7
Native American	9	1.4	8	1.5	17	1.5
Caucasian	296	46.8	234	44.0	530	45.5
Unknown	12	1.9	2	0.4	14	1.2
Total	**632**	**100.0**	**532**	**100.0**	**1164**	**100.0**
Age						
19 or younger	69	10.9	58	10.9	127	10.9
20-24	251	39.7[c]	253	47.6[c]	504	43.3
25-29	138	21.8[d]	88	16.5[d]	226	19.4
30-34	74	11.7	46	8.6	120	10.3
35-39	44	7.0	36	6.8	80	6.9
40-49	46	7.3	41	7.7	87	7.5
50 or older	10	1.6	10	1.9	20	1.7
Total	**632**	**100.0**	**532**	**100.0**	**1164**	**100.0**
Disability Status						
Not a DSPS Student	620	98.1	518	97.4	1138	97.8
DSPS Student	12	1.9	14	2.6	26	2.2
Total	**632**	**100.0**	**532**	**100.0**	**1164**	**100.0**

a – The proportion of male students was statistically significantly ($p < .05$) higher post-implementation (30.5%) than pre-implementation (25.2%) of the prerequisite.
b – The proportion of Hispanic students was statistically significantly ($p < .05$) higher post-implementation (33.6%) than pre-implementation (26.4%) of the prerequisite.
c – The proportion of students 20 – 24 years old was statistically significantly ($p < .05$) higher post-implementation (47.6%) than pre-implementation (39.7%) of the prerequisite.
d – The proportion of students 25 – 29 years old was statistically significantly ($p < .05$) lower post-implementation (16.5%) than pre-implementation (21.8%) of the prerequisite.

Table 4D: Gender, Ethnicity, Age, and Disability Status Pre- and Post-Implementation of MATH-095 as the Prerequisite to PSYCH-108.

Demographic Characteristics	Pre-Implementation		Post-Implementation		Total	
	#	N	%	#	N	%
Gender						
Female	25	69.4	271	61.7	296	62.3
Male	10	27.8	168	38.3	178	37.5
Unknown	1	2.8	0	0.0	1	0.2
Total	**36**	**100.0**	**439**	**100.0**	**475**	**100.0**
Ethnicity						
Asian	1	2.8	27	6.2	28	5.9
African American	4	11.1	37	8.4	41	8.6
Hispanic	5	13.9[a]	137	31.2[a]	142	29.9
Native American	1	2.8	12	2.7	13	2.7
Caucasian	22	61.1	216	49.2	238	50.1
Unknown	3	8.3	10	2.3	13	2.7
Total	**36**	**100.0**	**439**	**100.0**	**475**	**100.0**
Age						
19 or younger	14	38.9	115	26.2	129	27.2
20-24	14	38.9	225	51.3	239	50.3
25-29	2	5.6	44	10.0	46	9.7
30-34	1	2.8	25	5.7	26	5.5
35-39	1	2.8	13	3.0	14	2.9
40-49	2	5.6	11	2.5	13	2.7
50 or older	2	5.6	6	1.4	8	1.7
Total	**36**	**100.0**	**439**	**100.0**	**475**	**100.0**
Disability Status						
Not a DSPS Student	35	97.2	414	94.3	449	94.5
DSPS Student	1	2.8	25	5.7	26	5.5
Total	**36**	**100.0**	**439**	**100.0**	**475**	**100.0**

a – The proportion of Hispanic students was statistically significantly ($p < .05$) higher post-implementation (31.2%) than pre-implementation (13.9%) of the prerequisite.

Table 4E: Gender, Ethnicity, Age, and Disability Status Pre- and Post-Implementation of ENGL-010/015 as the Prerequisite to THART-226.

Demographic Characteristics	Pre-Implementation		Post-Implementation		Total	
	#	N	%	#	N	%
Gender						
Female	20	38.5	18	40.9	38	39.6
Male	32	61.5	26	59.1	58	60.4
Unknown	0	0.0	0	0.0	0	0.0
Total	**52**	**100.0**	**44**	**100.0**	**96**	**100.0**
Ethnicity						
Asian	3	5.8	2	4.5	5	5.2
African American	4	7.7	4	9.1	8	8.3
Hispanic	5	9.6$_1$	16	36.4$_a$	21	21.9
Native American	1	1.9	1	2.3	2	2.1
Caucasian	37	71.2$_b$	20	45.5$_b$	57	59.4
Unknown	2	3.8	1	2.3	3	3.1
Total	**52**	**100.0**	**44**	**100.0**	**96**	**100.0**
Age						
19 or younger	24	46.2	17	38.6	41	42.7
20-24	15	28.8$_c$	22	50.0$_c$	37	38.5
25-29	6	11.5	3	6.8	9	9.4
30-34	2	3.8	1	2.3	3	3.1
35-39	1	1.9	0	0.0	1	1.0
40-49	3	5.8	1	2.3	4	4.2
50 or older	1	1.9	0	0.0	1	1.0
Total	**52**	**100.0**	**44**	**100.0**	**96**	**100.0**
Disability Status						
Not a DSPS Student	50	96.2	41	93.2	91	94.8
DSPS Student	2	3.8	3	6.8	5	5.2
Total	**52**	**100.0**	**44**	**100.0**	**96**	**100.0**

a – The proportion of male students was statistically significantly ($p < .05$) higher post-implementation (30.5%) than pre-implementation (25.2%) of the prerequisite.
b – The proportion of Hispanic students was statistically significantly ($p < .05$) higher post-implementation (33.6%) than pre-implementation (26.4%) of the prerequisite.
c – The proportion of students 20 – 24 years old was statistically significantly ($p < .05$) higher post-implementation (47.6%) than pre-implementation (39.7%) of the prerequisite.
d – The proportion of students 25 – 29 years old was statistically significantly ($p < .05$) lower post-implementation (16.5%) than pre-implementation (21.8%) of the prerequisite.

Question 3: Does the increased success of students in each protected category support the implementation, if indeed the percentages of students in each group have changed?

The increased success of students in protected categories supports the implementation of the prerequisite for the following target courses: BIOL-130, BIOL-131, MICRO-150 with the CHEM-101 prerequisite only, PSYCH-108, and THART-226.

- BIOL-130 (see Table 5)
  - Female students who successfully completed the prerequisite were statistically significantly (p = .040) and substantially (ES = .44) more likely to successfully complete BIOL-130 (82%) than female students who had not successfully completed the prerequisite (64%)
  - Hispanic students who successfully completed the prerequisite were substantially (ES = .47) more likely to successfully complete BIOL-130 (72%) than Hispanic students who had not successfully completed the prerequisite (50%)
  - 20 – 24 year old students who successfully completed the prerequisite were statistically significantly (p = .026) and substantially (ES = .46) more likely to successfully complete BIOL-130 (80%) than 20 – 24 year old students who had not successfully completed the prerequisite (61%)
  - Students identified with a disability who successfully completed the prerequisite were substantially (ES = .43) more likely to successfully complete BIOL-130 (71%) than students identified with a disability who had not successfully completed the prerequisite (50%)
- BIOL-131 (see Table 5A)
  - Female students who successfully completed the prerequisite were statistically significantly (p = .008) and substantially (ES = .44) more likely to successfully complete BIOL-131 (73%) than female students who had not successfully completed the prerequisite (52%)
  - African American students who successfully completed the prerequisite were statistically significantly (p = .013) and substantially (ES = .83) more likely to successfully complete BIOL-131 (64%) than Hispanic students who had not successfully completed the prerequisite (20%)
  - 19 or younger students who successfully completed the prerequisite were statistically significantly (p = .006) and substantially (ES = .66) more likely to successfully complete BIOL-131 (71%) than 19 or younger students who had not successfully completed the prerequisite (39%)
  - Students identified with a disability who successfully completed the prerequisite were substantially (ES = .56) more likely to successfully complete BIOL-131 (63%) than students identified with a disability who had not successfully completed the prerequisite (33%)
- Statistics for JOUR-120 were not calculated because only a small number of students have enrolled in the journalism course (see Table 5B)
- MICRO-150 with the CHEM-101 prerequisite only (see Table 5C)
  - African American students who successfully completed the CHEM-101 prerequisite were statistically significantly (p = .010) and substantially (ES = .53) more likely to successfully complete MIRCO-150 (73%) than African American students who had not successfully completed the prerequisite (49%)
  - Native American students who successfully completed the CHEM-101 prerequisite were statistically significantly (p = .038) and substantially (ES = 1.29) more likely to successfully complete MIRCO-150 (83%) than Native American students who had not successfully completed the prerequisite (25%)
  - 19 or younger students who successfully completed the CHEM-101 prerequisite were substantially (ES = .26) more likely to successfully complete MICRO-150 (72%)

than 19 or younger students who had not successfully completed the prerequisite (60%)

- MICRO-150 with the CHEM-101 or CHEM-150 prerequisite (see Table 5C.1)
  - When CHEM-150 was added as an option to meet the prerequisite for MICRO-150 in Fall 2011, the likelihood that students would successfully complete MICRO-150 statistically significantly ($p < .001$) and substantially (ES = -.27)decreased from 77% to 65%
  - When looking at the success rate change by gender, ethnicity, age and disability status the likelihood of successfully completing MICRO-150 also decreased for every category
- PSYCH-108 with MATH-095 as a Prerequisite
  - Male students who successfully completed the prerequisite were substantially (ES = .46) more likely to successfully complete PSYCH-108 (79%) than male students who had not successfully completed the prerequisite (60%)
  - 19 or younger students who successfully completed the prerequisite were substantially (ES = .21) more likely to successfully complete PSYCH-108 (86%) than 19 or younger students who had not successfully completed the prerequisite (79%)
- THART-226 with ENGL-010 as a Prerequisite
  - The number of cases in the pre and post-implementation prerequisite groups is small, 52 and 44 respectively
  - The improvement in THART-226 overall from pre- to post-implementation is substantial (ES >=.20) for gender, ethnicity, and age

Table 5: BIOL-130 Success Rates Pre- and Post-Implementation of CHEM-101 or 150 and MATH-095 as the Prerequisites to BIOL-130 by Gender, Ethnicity, Age, and Disability Status.

Demographic Characteristic	Success Rate							
	Pre-Implementation			Post-Implementation				
	#	N	%	#	N	%	ES	P Value
Gender								
Female	23	36	63.9	122	149	81.9	.44	.040
Male	16	27	59.3	116	149	77.9	.43	.071
Unknown	1	1	100.0	1	1	100.0		
Total	**40**	**64**	**62.5**	**239**	**299**	**79.9**	**.41**	**.009**
Ethnicity								
Asian	6	12	50.0	27	34	79.4	.65	.084
African American	3	4	75.0	18	24	75.0	.00	1.000
Hispanic	7	14	50.0	59	82	72.0	.47	.140
Native American	1	3	33.3	3	4	75.0	.78	.363
Caucasian	20	26	76.9	127	146	87.0	.28	.259
Unknown	3	5	60.0	5	9	55.6	-.09	.885
Total	**40**	**64**	**62.5**	**239**	**299**	**79.9**	**.41**	**.009**
Age								
19 or younger	6	10	60.0	45	61	73.8	.30	.428
20-24	23	38	60.5	120	150	80.0	.46	.026
25-29	5	8	62.5	47	54	87.0	.66	.198
30-34	1	1	100.0	15	20	75.0		
35-39	2	2	100.0	4	4	100.0		
40-49	3	5	60.0	8	10	80.0	.44	.486
50 or older	0	0		0	0			
Total	**40**	**64**	**62.5**	**239**	**299**	**79.9**	**.41**	**.009**
Disability Status								
Not a DSPS Student	39	62	62.9	234	292	80.1	.41	.010
DSPS Student	1	2	50.0	5	7	71.4	.43	.700
Total	**40**	**64**	**62.5**	**239**	**299**	**79.9**	**.41**	**.009**

Table 5A: BIOL-131 Success Rates Pre- and Post-Implementation of MATH-095 as the Prerequisite to BIOL-131 by Gender, Ethnicity, Age, and Disability Status.

Demographic Characteristic	Success Rate							
	Pre-Implementation			Post-Implementation				
	#	N	%	#	N	%	ES	P Value
Gender								
Female	27	52	51.9	135	186	72.6	.44	.008
Male	18	33	54.5	124	175	70.9	.35	.086
Unknown	1	1	100.0	1	1	100.0		
Total	**46**	**86**	**53.5**	**260**	**362**	**71.8**	**.39**	**.002**
Ethnicity								
Asian	6	8	75.0	34	52	65.4	-.20	.588
African American	2	10	20.0	18	29	62.1	.83	.013
Hispanic	10	14	71.4	65	101	64.4	-.15	.599
Native American	1	1	100.0	4	6	66.7		
Caucasian	25	48	52.1	135	169	79.9	.63	.001
Unknown	2	5	40.0	4	5	80.0	.77	.242
Total	**46**	**86**	**53.5**	**260**	**362**	**71.8**	**.39**	**.002**
Age								
19 or younger	9	23	39.1	73	103	70.9	.66	.006
20-24	24	46	52.2	119	176	67.6	.32	.062
25-29	6	9	66.7	45	55	81.8	.37	.389
30-34	1	1	100.0	8	11	72.7		
35-39	1	2	50.0	5	6	83.3	.72	.550
40-49	5	5	100.0	8	9	88.9		
50 or older	0	0		2	2	100.0		
Total	**46**	**86**	**53.5**	**260**	**362**	**71.8**	**.39**	**.002**
Disability Status								
Not a DSPS Student	45	83	54.2	255	354	72.0	.38	.003
DSPS Student	1	3	33.3	5	8	62.5	.56	.463
Total	**46**	**86**	**53.5**	**260**	**362**	**71.8**	**.39**	**.002**

Table 5B: JOUR-120 Success Rates Pre- and Post-Implementation of ENGL-010/015 as the Prerequisite to JOUR-120 by Gender, Ethnicity, Age, and Disability Status.

Demographic Characteristic	Success Rate							
	Pre-Implementation			Post-Implementation				
	#	N	%	#	N	%	ES	P Value
Gender								
Female	9	13	69.2	1	2	50.0		
Male	8	9	88.9	3	7	42.9		
Total	**17**	**22**	**77.3**	**4**	**9**	**44.4**		
Ethnicity								
Asian	3	4	75.0	0	1	0.0		
African American	1	1	100.0	1	1	100.0		
Hispanic	2	3	66.7	2	4	50.0		
Native American	0	0		0	0			
Caucasian	10	13	76.9	1	3	33.3		
Unknown	1	1	100.0	0	0			
Total	**17**	**22**	**77.3**	**4**	**9**	**44.4**		
Age								
19 or younger	7	8	87.5	1	4	25.0		
20-24	7	10	70.0	3	5	60.0		
25-29	3	4	75.0	0	0			
30-34	0	0		0	0			
35-39	0	0		0	0			
40-49	0	0		0	0			
50 or older	0	0		0	0			
Total	**17**	**22**	**77.3**	**4**	**9**	**44.4**		
Disability Status								
Not a DSPS Student	17	22	77.3	4	9	44.4		
DSPS Student	0	0		0	0			
Total	**17**	**22**	**77.3**	**4**	**9**	**44.4**		

Table 5C: MICRO-150 Success Rates Pre- and Post-Implementation of CHEM-101 as the Prerequisite to MICRO-150 by Gender, Ethnicity, Age, and Disability Status.

Demographic Characteristic	Success Rate							
	Pre-Implementation			Post-Implementation				
	#	N	%	#	N	%	ES	P Value
Gender								
Female	159	227	70.0	1,071	1,417	75.6	.13	.089
Male	47	73	64.4	317	434	73.0	.19	.152
Unknown	0	0		2	2	100.0		
Total	**206**	**300**	**68.7**	**1,390**	**1,853**	**75.0**	**.14**	**.027**
Ethnicity								
Asian	12	22	54.5	127	169	75.1	.46	.071
African American	16	33	48.5	171	235	72.8	.53	.010
Hispanic	26	46	56.5	317	450	70.4	.30	.071
Native American	1	4	25.0	19	23	82.6	1.29	.038
Caucasian	147	185	79.5	720	925	77.8	-.04	.621
Unknown	4	10	40.0	36	51	70.6	.64	.087
Total	**206**	**300**	**68.7**	**1,390**	**1,853**	**75.0**	**.14**	**.027**
Age								
19 or younger	22	37	59.5	141	197	71.6	.26	.170
20-24	63	98	64.3	525	725	72.4	.18	.114
25-29	34	49	69.4	281	361	77.8	.20	.228
30-34	40	52	76.9	160	208	76.9	.00	1.000
35-39	31	38	81.6	136	169	80.5	-.03	.876
40-49	11	19	57.9	128	167	76.6	.43	.123
50 or older	5	7	71.4	19	26	73.1	.04	.936
Total	**206**	**300**	**68.7**	**1,390**	**1,853**	**75.0**	**.14**	**.027**

Note: Disability status was not examined because it wasn't available prior to fall 1998.

Table 5C.1: MICRO-150 Success Rates Pre- and Post-Implementation of CHEM-101 or 150 as the Prerequisite to MICRO-150 by Gender, Ethnicity, Age, and Disability Status.

Demographic Characteristic	Success Rate							
	Pre-Implementation			Post-Implementation				
	#	N	%	#	N	%	ES	P Value
Gender								
Female	365	471	77.5	245	369	66.4	-.25	< .001
Male	119	159	74.8	97	162	59.9	-.32	.004
Unknown	2	2	100.0	1	1	100.0		
Total	**486**	**632**	**76.9**	**343**	**532**	**64.5**	**-.27**	**< .001**
Ethnicity								
Asian	54	67	80.6	38	57	66.7	-.32	.083
African American	66	81	81.5	32	52	61.5	-.45	.015
Hispanic	116	167	69.5	105	179	58.7	-.22	.036
Native American	7	9	77.8	5	8	62.5	-.33	.525
Caucasian	235	296	79.4	162	234	69.2	-.23	.008
Unknown	8	12	66.7	1	2	50.0	-.34	.754
Total	**486**	**632**	**76.9**	**343**	**532**	**64.5**	**-.27**	**< .001**
Age								
19 or younger	50	69	72.5	33	58	56.9	-.33	.070
20-24	185	251	73.7	172	253	68.0	-.13	.158
25-29	110	138	79.7	53	88	60.2	-.43	.002
30-34	60	74	81.1	36	46	78.3	-.07	.714
35-39	33	44	75.0	24	36	66.7	-.18	.423
40-49	39	46	84.8	22	41	53.7	-.68	.002
50 or older	9	10	90.0	3	10	30.0	-1.19	.004
Total	**486**	**632**	**76.9**	**343**	**532**	**64.5**	**-.27**	**< .001**
Disability Status								
Not a DSPS Student	477	620	76.9	333	518	64.3	-.28	< .001
DSPS Student	9	12	75.0	10	14	71.4	-.08	.845
Total	**486**	**632**	**76.9**	**343**	**532**	**64.5**	**-.27**	**< .001**

Table 5D: PSYCH-108 Success Rates Pre- and Post-Implementation of MATH-095 as the Prerequisite to PSYCH-108 by Gender, Ethnicity, Age, and Disability Status.

Demographic Characteristic	Success Rate							
	Pre-Implementation			Post-Implementation				
	#	N		#	N		ES	P Value
Gender								
Female	22	25	88.0	240	271	88.6	.02	.935
Male	6	10	60.0	133	168	79.2	.46	.251
Unknown	1	1	100.0	0	0			
Total	**29**	**36**	**80.6**	**373**	**439**	**85.0**	**.12**	**.523**
Ethnicity								
Asian	1	1	100.0	24	27	88.9		
African American	2	4	50.0	31	37	83.8	.84	.259
Hispanic	4	5	80.0	117	137	85.4	.15	.790
Native American	0	1	0.0	10	12	83.3		
Caucasian	19	22	86.4	182	216	84.3	-.06	.790
Unknown	3	3	100.0	9	10	90.0	-.36	.339
Total	**29**	**36**	**80.6**	**373**	**439**	**85.0**	**.12**	**.523**
Age								
19 or younger	11	14	78.6	99	115	86.1	.21	.526
20-24	12	14	85.7	194	225	86.2	.01	.959
25-29	1	2	50.0	39	44	88.6	1.04	.470
30-34	0	1	0.0	17	25	68.0		
35-39	1	1	100.0	11	13	84.6		
40-49	2	2	100.0	9	11	81.8		
50 or older	2	2	100.0	4	6	66.7		
Total	**29**	**36**	**80.6**	**373**	**439**	**85.0**	**.12**	**.523**
Disability Status								
Not a DSPS Student	28	35	80.0	353	414	85.3	.15	.457
DSPS Student	1	1	100.0	20	25	80.0		
Total	**29**	**36**	**80.6**	**373**	**439**	**85.0**	**.12**	**.523**

Table 5E: THART-226 Success Rates Pre- and Post-Implementation of ENGL-010/015 as the Prerequisite to THART-226 by Gender, Ethnicity, Age, and Disability Status.

Demographic Characteristic	Success Rate							
	Pre-Implementation			Post-Implementation				
	#	N		#	N		ES	P Value
Gender								
Female	14	20	70.0	15	18	83.3	.31	.343
Male	20	32	62.5	19	26	73.1	.22	.398
Total	**34**	**52**	**65.4**	**34**	**44**	**77.3**	.26	.206
Ethnicity								
Asian	1	3	33.3	2	2	100.0	1.22	.139
African American	3	4	75.0	3	4	75.0	.00	1.000
Hispanic	3	5	60.0	12	16	75.0	.32	.584
Native American	0	1	0.0	1	1	100.0		
Caucasian	25	37	67.6	15	20	75.0	.16	.559
Unknown	2	2	100.0	1	1	100.0		
Total	**34**	**52**	**65.4**	**34**	**44**	**77.3**	.26	.206
Age								
19 or younger	14	24	58.3	11	17	64.7	.13	.688
20-24	12	15	80.0	19	22	86.4	.17	.629
25-29	3	6	50.0	3	3	100.0	1.00	.060
30-34	2	2	100.0	1	1	100.0		
35-39	1	1	100.0	0	0	0.0		
40-49	1	3	33.3	0	1	0.0		
50 or older	1	1	100.0	0	0	0.0		
Total	**34**	**52**	**65.4**	**34**	**44**	**77.3**	.26	.206
Disability Status								
Not a DSPS Student	32	50	64.0	31	41	75.6	.25	.232
DSPS Student	2	2	100.0	3	3	100.0		
Total	**34**	**52**	**65.4**	**34**	**44**	**77.3**	.26	.206

Question 4: Was there disproportionate impact?

In addition to providing evidence that the proposed prerequisite is "such that a student who has not met the prerequisite is highly unlikely to receive a satisfactory grade in the course" [Title 5, §5503(d)(2)], Title 5 regulations also state that the district should conduct, "…an evaluation to determine whether the prerequisite or corequisite has a disproportionate impact on particular groups of students described in terms of race, ethnicity, gender, age or disability, as defined by the Chancellor. When there is a disproportionate impact on any such group of students, the district shall, in consultation with the Chancellor, develop and implement a plan setting forth the steps the district will take to correct the disproportionate impact." [Title 5, §55003(g)(2)]. To clarify, the Chancellor's Office has operationally defined disproportionate impact, stating that it occurs when, "…the percentage of persons from a particular racial, ethnic, gender, age or disability group who are directed to a particular service or placement based on an assessment instrument, method or procedure is significantly different than the representation of that group in the population of persons being assessed and that discrepancy is not justified by empirical evidence demonstrating that the assessment instrument, method or procedure is a valid and reliable predictor of performance in the relevant educational setting [Title 5, §55502(d)]."

A useful statistical model in analyzing disproportionate impact is classification and regression tree (CART) modeling, a statistical application that is useful in situations in which the overall goal is to divide a population into segments that differ with respect to a designated criterion. In short, CART modeling affords researchers the opportunity to examine the interaction and impact of a number of distinct categorical predictor variables (e.g., gender, ethnicity, and age) on a categorical dependent variable (e.g., met prerequisite/did not meet prerequisite). 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. 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 applies to disproportionate impact, CART modeling has a number of distinct advantages over traditional statistical applications used to examine categorical data (e.g., chi-square, cluster analysis, etc.). Utilizing CART modeling, researchers can easily determine whether specific aspects of numerous categorical predictor variables merge to provide a more accurate identification of populations experiencing disproportionate impact (e.g., male Latino students under twenty-one years of age, female Asian students 30 to 34 years of age, etc.).

As it pertains to this study, CART modeling was conducted to determine whether specific student populations disproportionately earned a GOR in the target courses pre- and/or post-implementation. The following predictor variables were entered into each CART model:

Gender:

Group 1) Male
Group 2) Female
Group 3) Unknown/No Response

Ethnicity:

Group 1) Asian
Group 2) African American
Group 3) Caucasian
Group 4) Hispanic
Group 5) Native American
Group 6) Caucasian
Group 7) Unknown/No Response

Age:

Group 1) 19 or Younger
Group 2) 20 to 24 Years of Age
Group 3) 25 to 29 Years of Age
Group 4) 30 to 34 Years of Age
Group 5) 35 to 39 Years of Age
Group 6) 40 to 49 Years of Age
Group 7) 50 Years of Age or Older

Disability:

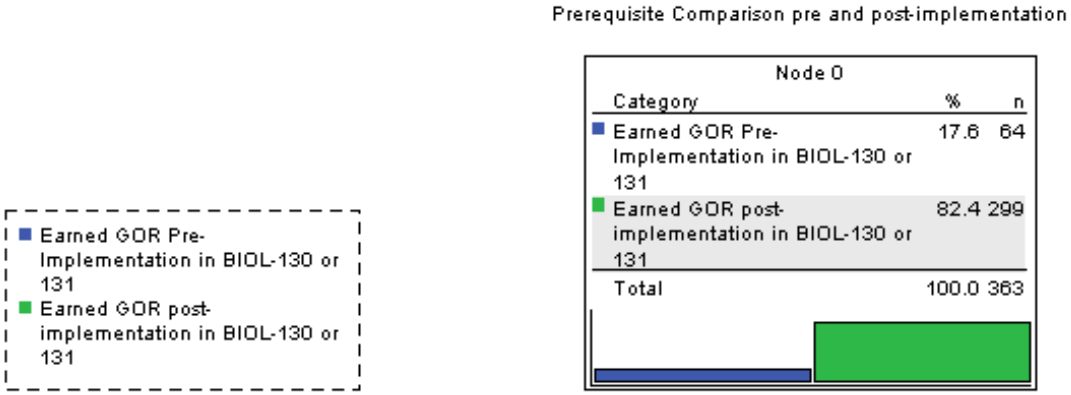
Group 1) Students Who Do Not Have Disabilities
Group 2) Students With Disabilities

To examine whether disproportionate impact existed, one CART model was generated for each target course to compare the demographic characters pre- and post-implementation of the prerequisite.

Disproportionate impact was not indicated for any of the target courses examined: BIOL-130, BIOL-131, JOUR-120, MICRO-150 with CHEM-101 as a prerequisite, MICRO-150 with CHEM-101 or 150 as a prerequisite, PSYCH-108, and THART-226.

Figure 1 uses segmentation modeling to identify disproportionate impact when CHEM-101 or 150 and MATH-095 was and was not the prerequisite for BIOL-130. ***The segmentation model indicates that disproportionate impact does not exist by gender, ethnicity, age, and/or disability status.***

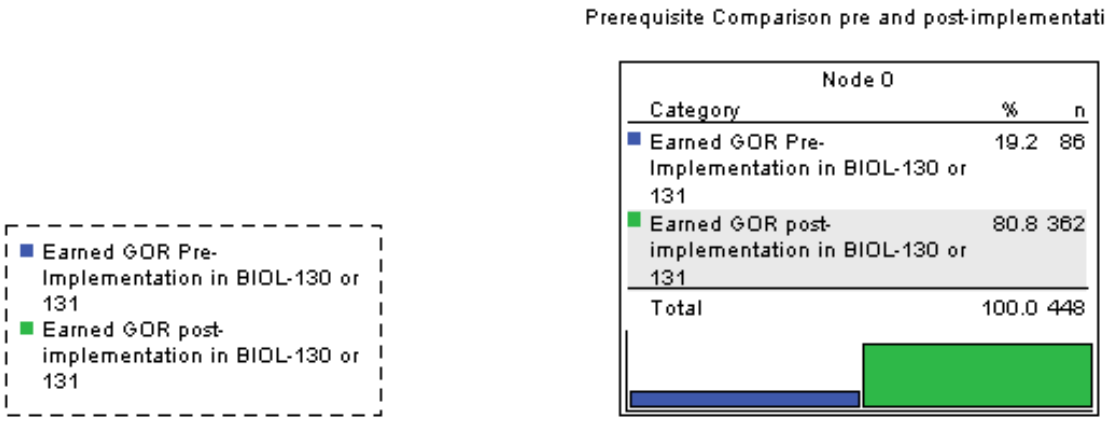
Figure 1: CART Segmentation Model Examining Disproportionate Impact When Prerequisite for BIOL-130 is CHEM-101 or 150 and MATH-095 (Age, Gender, Ethnicity, and Disability Status examined).



Note: Disproportionate Impact was not identified. Risk Estimate = .176, SE of Risk Estimate = .020, Improvement set to .01, Child Node set to 5% of Total N unless less than 50, Parent Node is twice the Child Node.

Figure 2 uses segmentation modeling to identify disproportionate impact when MATH-095 was and was not the prerequisite for BIOL-131. ***The segmentation model indicates that disproportionate impact does not exist by gender, ethnicity, age, and/or disability status.***

Figure 2: CART Segmentation Model Examining Disproportionate Impact When Prerequisite for BIOL-131 is MATH-095 (Age, Gender, Ethnicity, and Disability Status examined).



Note: Disproportionate Impact was not identified. Risk Estimate = .192, SE of Risk Estimate = .019, Improvement set to .01, Child Node set to 5% of Total N unless less than 50, Parent Node is twice the Child Node.

Figure 3 uses segmentation modeling to identify disproportionate impact when ENGL-010/015 was and was not the prerequisite for JOUR-120. ***The segmentation model indicates that disproportionate impact does not exist by gender, ethnicity, age, and/or disability status.***

Figure 3: CART Segmentation Model Examining Disproportionate Impact When Prerequisite for JOUR-120 is ENGL-010 (Age, Gender, Ethnicity, and Disability Status examined).

Prerequisite Comparison pre and post-implementation

Node 0

Category	%	n
Earned GOR Pre-Implementation in JOUR-120	71.0	22
Earned GOR post-implementation in JOUR-120	29.0	9
Total	100.0	31

Note: Disproportionate Impact was not identified. Risk Estimate = .290, SE of Risk Estimate = .082, Improvement set to .01, Child Node set to 5% of Total N unless less than 50, Parent Node is twice the Child Node.

Figure 4 uses segmentation modeling to identify disproportionate impact when CHEM-101 or 150 was and was not the prerequisite for MICRO-150. ***The segmentation model indicates that disproportionate impact does not exist by gender, ethnicity, age, and/or disability status.***

Figure 4: CART Segmentation Model Examining Disproportionate Impact When Prerequisite for MICRO-150 is CHEM=101 or CHEM-150 (Age, Gender, Ethnicity, and Disability Status examined).

Prerequisite Comparison pre and post-implementation

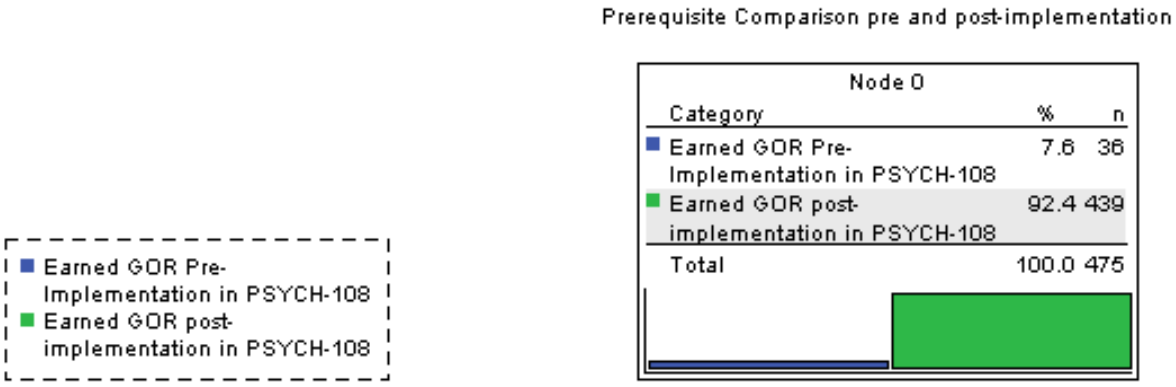
Node 0

Category	%	n
Earned GOR Pre-Implementation in MICRO-150	54.3	632
Earned GOR post-implementation in MICRO-150	45.7	532
Total	100.0	1164

Note: Disproportionate Impact was not identified. Risk Estimate = .457, SE of Risk Estimate = .015, Improvement set to .01, Child Node set to 5% of Total N unless less than 50, Parent Node is twice the Child Node.

Figure 5 uses segmentation modeling to identify disproportionate impact when MATH-095 was and was not the prerequisite for PSYCH-108. ***The segmentation model indicates that disproportionate impact does not exist by gender, ethnicity, age, and/or disability status.***

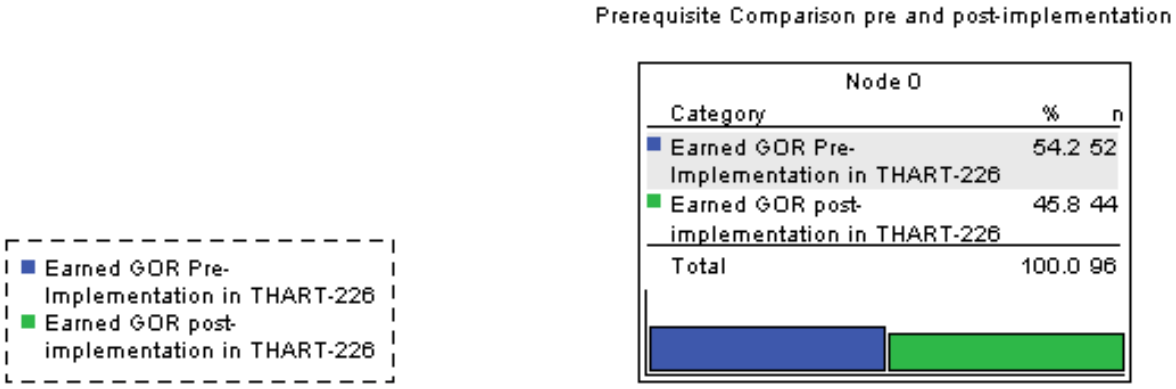
Figure 5: CART Segmentation Model Examining Disproportionate Impact When Prerequisite for PSYCH-108 is MATH-095 (Age, Gender, Ethnicity, and Disability Status examined).



Note: Disproportionate Impact was not identified. Risk Estimate = .076, SE of Risk Estimate = .012, Improvement set to .01, Child Node set to 5% of Total N unless less than 50, Parent Node is twice the Child Node.

Figure 6 uses segmentation modeling to identify disproportionate impact when ENGL-010 was and was not the prerequisite for THART-226. ***The segmentation model indicates that disproportionate impact does not exist by gender, ethnicity, age, and/or disability status.***

Figure 6: CART Segmentation Model Examining Disproportionate Impact When Prerequisite for THART-226 is ENGL-010 (Age, Gender, Ethnicity, and Disability Status examined).



Note: Disproportionate Impact was not identified. Risk Estimate = .458, SE of Risk Estimate = .051, Improvement set to .01, Child Node set to 5% of Total N unless less than 50, Parent Node is twice the Child Node.

Question 5: What effect did the implementation have on overall course enrollment?

To examine the effect on the implementation of the prerequisite on enrollment, the six primary terms (i.e. three years) pre-implementation were compared to the six primary terms post-implementation. Overall, the results indicated that course enrollment in the target courses increased or only slightly decreased from pre- to post-implementation of the prerequisite (see Table 6). Specifically, enrollments increased for BIOL-130 and PSYCH-108 and only slightly decreased for BIOL-131. There was a 16% decrease for MICRO-150 from 2008-09 to 2010-11 to 2011-12 to 2013-14, which mirrored the decrease in enrollments that occurred because of statewide budget cuts. JOUR-120 decreased by 50%, but this is because the course was only offered once from 2009-10 to 2012-13. THART-226, Play and Screenplay Analysis, decreased 50% from 2005-06 to 2007-08 to 2008-09 to 2010-11. The decreases in JOUR-120 and THART-226 are most likely a result of these courses being designed for specific populations: writing for the school newspaper and writing screen plays.

Table 6: BIOL-130 GOR Earned Three Years Pre- and Post-Implementation of the Prerequisite by Term.

Implementation		Course					
		BIOL-130	BIOL-131	JOUR-120	MICRO-150	PSYCH-108	THART-226
Pre	Fall 1	20	0	0	96		18
	Spring 1	0	31	11	102		0
	Fall 2	25	0	0	100		20
	Spring 2	0	30	7	105		0
	Fall 3	19	0	0	104	16	14
	Spring 3	0	25	0	125	20	0
	Total	**64**	**86**	**18**	**632**	**36**	**52**
Post	Fall 1	18	0	0	111	13	7
	Spring 1	0	24	0	96	36	0
	Fall 2	21	0	0	83		11
	Spring 2	0	26	0	86		0
	Fall 3	31	0	0	85		7
	Spring 3	0	32	9	71		0
	Total	**70**	**82**	**9**	**532**	**49**	**25**
Difference		**+6**	**-4**	**-9**	**-100**	**+13**	**-27**
% Difference		**+9.4%**	**-4.7%**	**-50.0%**	**-15.8%**	**36.1%**	**-51.9%**

Any questions regarding this report can be directed to the Office of Institutional Effectiveness, Research, and Planning at (909) 389-3206 or you may send an email to kwurtz@craftonhills.edu: 2014_Prereq_Studies2.docx, 20140605_9798to1314_GOR_CHC_TargetCourses_CurrentPreReq.sav, 20140605_9394to1011_GOR_CHC_MICRO150TargetCourses_CurrentPreReq.sav.