Appendix 2.3: Freshman Success Program Statistical Analysis

2.3.a.	Academic Coaching Pilot Report April 2010	p. 1 – 19
2.3.b.	Academic Coaching Study Year-End Memo August 2010	p. 20 – 25
2.3.c.	Freshman Success Program Year-End Memo May 2011	p. 26 – 31

Academic Coaching Pilot

April 26, 2010

To: Provost Robert Koob

From: Academic Coaching Committee

Brad Kyker
Cem Sunata
Charity Romano
Greg Roldan
Helen Bailey
Jim Maraviglia
Kristen Meier
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Matt Carlton
Meghan Farrier
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Kris McKinlay, Chair

Table of Contents…

Executive Summary – Page 3

Note of Thanks – Page 4

Description of Intervention – Pages 5-7

Statistical Analysis – Pages 8-19

Executive Summary

Cooperative Academic Coaching Leads to Student Success

The Challenge
Fall 2009 first time freshmen at Cal Poly faced a more stringent implementation of the university's academic probation policy than in previous years as a result of shrinking enrollment dollars. Anticipating that this would potentially lead to an increase in student dismissals, the University was challenged to implement an effective support program to make every conceivable effort to retain its qualified students.

The Action
A cooperative academic coaching intervention was executed, and its effectiveness assessed, to assist the University in support of its students experiencing first-quarter academic difficulty in four of the six colleges on its campus volunteering to take part of the effort. Advisors from the Colleges of Agriculture, Architecture, Business, Engineering and the departments of Student Support Services and Evaluations worked together in carrying out the workshop intervention, supported by the Admissions Office employing its CRM tool set. A description of this intervention is attached.

The Result
The Winter term 2010 Academic Coaching intervention had a significant positive effect on students' self-efficacy, spring term enrollment, and GPA. Statistical analysis of the effort is attached in the Academic Coaching Study memo.

Committee's Next Steps

- Study effects of "resource utilization" as it relates to student persistence.
- Monitor student persistence of Fall 2009 pilot cohort to assess long-term persistence.
- Develop predictive modeling to provide early intervention to 'at risk' students for incoming class of 2010.

Recommendations

- Build continuing cooperative model for intervention across all colleges and campus offices.
- Build and utilize "Retain" CRM software to achieve optimal communications and relationship management.
- Provide early intervention to identified 'at risk' students for incoming class of 2010.
- Empower team attending NACADA Retention Institute to fully explore retention strategies to recommend campus policy and practices for unified advising effort.

Note of thanks:

The Academic Coaches:
Amy Swanson (OCOB), Anya Bergman (COSM), Brad Kyker (CAFES), Greg Roldan (CENG), Helen Bailey (Registrar's Office), Kristi Weddige (COSM), Kristen Meier (OCOB), Meghan Farrier (COSM), Susan Sparling (SAS).

Workshop Presenter:
Charity Romano (OCOB).

CRM Leadership:
Al Nunez

Statistical Analysis:
Profs. Heather Smith & Matt Carlton (COSM), Alex Herrington and Huey Dodson.

Students Assisting:…the incredible staff of students powering the Admission's and Orfalea College of Business' support for the entire effort.

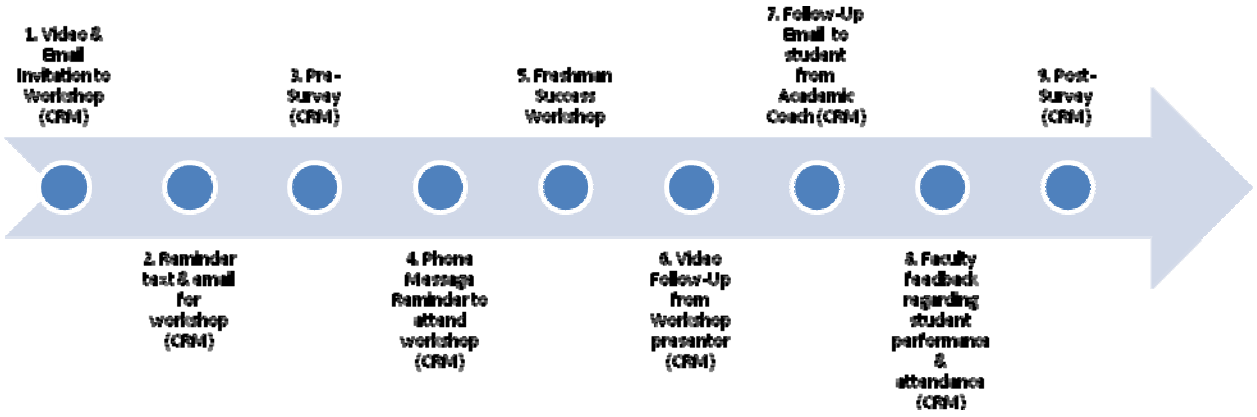
Provost's Office:
Asst.Vice Provost Kimi Ikeda
Diane Dixon and Debra Sherberne

Admissions Office:
Asst. Vice Provost Jim Maraviglia

Description of Intervention

Our intervention with students included several components and tool sets. Though the main focus was around the use of a workshop and academic coaching techniques, the use of Customer Relations Management (CRM) Software was a notable addition to the overall intervention. The workshop and academic coaching provided the theoretical approach, while the CRM software provided a mode of intentional and strategic messaging to students and faculty of students in the pilot group. The intervention timeline and use of CRM is outlined below, as well as a more comprehensive description of the workshop and academic coaching. We believe the combined components of our intervention contributed to its success, though the measureable student success was focused on the actual workshop and self-efficacy measurements, rather than use of CRM software.

Timeline of Intervention Components:



1. After Fall grades were posted, pilot group students were sent an email/video invitation to attend a Freshman Success Workshop. (CRM)
2. Students who did not RSVP in a timely manner were sent follow-up email and text messages. (CRM)
3. During the 1st week of the quarter, students were sent the survey to be completed before the workshop. (CRM electronic survey).*
4. Students were sent a phone message and reminder to attend workshop. (CRM)
5. Freshman Success Workshop takes place during the 2nd week of the quarter.
6. Students were sent a follow-up Video message from workshop presenter to remind and encourage students to stay on track with the goals they made at the workshop.
7. Students were sent a personalized follow-up email from their academic coaches during the fourth week of the quarter—specifically inquiring about the progress of student's action plan from the workshop. (CRM)

8. Students were sent an email indicating faculty concern. (CRM) **
9. Students were sent a survey again.* (CRM)

*Control group students were also sent surveys at this time.
**Randomized group of students within the control and pilot group were selected to get feedback from instructors. Instructors of these students were emailed through the CRM and asked to give feedback regarding student performance and attendance. Concerns were then relayed to the students directly. No correlation was found in GPA or Self Efficacy of students who received faculty feedback.

Using CRM Software:
Using Customer Relations Management software allowed thorough and strategic communication with students. These communications allowed for timely invitations, reminders and follow-up to the workshop. The CRM also allowed us for a sophisticated tracking mechanism to communicate with faculty of pilot students, asking them to comment on student attendance and performance. Faculty could easily respond electronically and students were then automatically emailed a notice indicating that there was concern.
Although full affect the CRM could not necessarily be measured through this experiment, the use of this software is worth noting because it allowed for such thorough pre- and post- communication around the workshop. We believe this helped reinforce the importance of the workshop and a 97% attendance at the workshop.

Description of Workshop and Academic Coaching Technique:
The purpose of the workshop is to reach students early in the quarter with a positive and motivating message to inspire students to reach their highest potential for the quarter. Because goal-making, and motivation are all linked to student success, the workshop used academic coaching techniques, which focused on motivation and strategic goal setting. The workshop was comprised of two parts—a large-group presentation, followed by breakout groups of 10-12 students led by academic coaches. During the main presentation, a myriad of strategies for student success were discussed, including time management, office hours, study habits, tutoring, health, social & extra-curricular activities and overall life balance. Students were also reminded of the many resources on campus that can support their growth in these areas. At the end of the presentation, students were challenged to consider the strategies they wanted to commit to trying for the quarter. In the breakout sessions that followed, students were given worksheets to help articulate their goals for the quarter and the specific action steps they would implement to invest in their own success. Because of the small group atmosphere, every student shared their goals with the group to help reinforce their commitment as well as establish a form of accountability. Coaches were also able to offer feedback and encouragement during the process.
Perhaps the most notable component of the workshop was the overall approach and tone of the workshop. The workshop presenter strategically approached students with a positive regard and full faith that they could succeed if they chose to implement good strategies for success. Very little reference to academic probation or the negative effects of academic status were made. Instead, students were challenged to make an honest

assessment of the barriers from success that they had experienced; and from there, create a strategic plan for overcoming those barriers. This positive regard and motivational attitude was also exhibited by the academic coaches in the breakout sessions. The tone of the workshop was an intentional shift from some of the more traditional academic probation workshops, in which students are thoroughly warned about their academic status and potential failure and then given direction and resources to help improve their academic standing.

Statistical Analysis

Contents of Statistical Analysis

I. Statistical Summary
II. Introduction
III. Methodology
IV. Results
V. Appendix

Authors:
Alex Herrington & Huey Dodson
Guided by:
Profs. Heather Smith & Matt Carlton

I. Statistical Summary

Freshmen who were on academic probation (AP) were randomly put into either a control or treatment group. The control group received whatever counseling services their respective college normally gave, college specific control conditions are in the Appendix. The treatment group was required to go to an academic coaching workshop in lieu of their college advising. We investigated the effects of the workshop treatment on students' self-efficacy and performance. The responses we looked at were: GPA, spring quarter enrollment, and self-efficacy.

The workshop treatment had a significant effect on all three of the responses of interest. Those students who attended the workshops had significantly higher Winter GPAs than those who did not attend. Also, there was a statistically significant difference in the proportion of students who raised their Cumulative GPA above 2.0 between the treatment and control groups.

Additionally, those who attended the workshops had a significantly higher rate of spring enrollment than those who did not attend. On the same point, students in the College of Engineering had a significantly lower rate of spring enrollment than those in the other three colleges.

Finally, the students who attended the workshops showed significantly more positive changes in attitude, as measured by the five attitude indices, than those who did not attend.

II. Introduction

This memorandum is meant to clarify and document the details of the statistical analysis for the Academic Coaching Study. The information contained in this memo is meant to be helpful toward meeting your goals of keeping Cal Poly freshmen enrolled and on task.

As we understand it, the main interest of the study was to observe the effect of academic coaching seminars on the attitude and performance of Cal Poly freshmen on academic probation.

A preliminary memo (02/10/10, A. Herrington) was written describing the survey results from the first survey taken. As a result, this memo looks to describe the change in the attitudes and performance of the students in the study.

III. Methodology

Before we began our analysis we outlined the objectives of the study and trends to look out for. We established that there were three responses we would predict and explain given the data.

NOTE: Though we sought to explain the response variables with the predictor variables listed, not all predictors were statistically significant. The predictors in **bold** turned out to be significant.

1) **GPA** - We investigated whether or not the treatment had a positive effect on student GPA. We explained Winter quarter GPA responses with combinations of several predictors:

    a. Self-efficacy survey response indices

    b. Treatment Group vs. Control

    c. College (COSAM, CAFES, etc.)

    d. Faculty Contact

2) **Spring Enrollment** - We explored whether or not being in the treatment group increased the chances of staying enrolled for Spring 2010. We estimated the probability of spring enrollment based on the following factors:

    a. Treatment Group vs. Control

    b. College

    c. Faculty Contact

3) **Attitude** – Finally, we investigated if being in the treatment group had an effect on students' attitudes as indicated by the five self-efficacy indices. We predicted attitude changes with the following predictors:

    a. Treatment Group vs. Control

    b. College

    c. Faculty Contact

In this part of the analysis we used only those students who completed both the first *and* the second survey, otherwise differences in self-efficacy could not be assessed. Also, in order to attribute changes in self-efficacy to the effect of being in a workshop, the student must have taken the first survey *before* he/she attended the workshop. Of the 317 students in the sample, 228 met these criteria.

In the analysis process we came across a discrepancy in fall quarter GPAs between two of the data files we were given. This turned out to be caused by students re-taking fall attempted classes in the winter, thus altering their original fall GPA. We used their original fall GPAs for all analysis purposes.

IV. Results

In order to aid the communication of statistical significance, the following asterisk code is used to point out significant p-values:

* indicates a p-value between 0.10 and 0.05
** indicates a p-value between 0.05 and 0.01
*** indicates a p-value less than 0.01

Below is a table describing the sample size distribution across each college in the study.

Sample Size Distribution		Control	Treatment	Total
College	**CAFES**	43	45	88
	OCOB	14	15	29
	CENG	64	64	128
	COSAM	36	36	72
	Aggregate	157	160	317

Table 1 – The number in each cell represents the number of students in that cross classification.

1) GPA

This section describes findings about the changes in students' GPA. Below is a table summarizing GPA findings:

		Control			Treatment			Treatment vs. Control	
GPA Summary Statistics (Average GPA)		**Fall GPA**	**Winter GPA**	**Change in GPA**	**Fall GPA**	**Winter GPA**	**Change in GPA**	**Winter GPA p-value**	**Change in GPA p-value**
College	**CAFES**	1.492	2.102	0.565	1.463	2.328	0.866	0.1411	0.0717*
	OCOB	1.417	2.311	0.785	1.609	2.258	0.649	0.8027	0.5805
	CENG	1.323	1.897	0.578	1.347	2.144	0.797	0.1157	0.1692
	COSAM	1.371	2.128	0.734	1.387	2.491	1.061	0.0512*	0.1018
	Aggregate	1.389	2.042	0.628	1.414	2.280	0.857	0.0081***	0.0147**

Table 2 – Note that the "Change in GPA" statistic is not the difference between the average Fall and Winter GPAs, but the average of the difference between the Fall and Winter GPA for *each student.*

Interestingly, within each college a significant effect due to treatment was not detected. However, *cumulatively* we can detect a statistically significant effect of the treatment on both winter GPA and change in GPA. This is due to the fact that the cumulative sample size is large enough to detect smaller differences that the smaller sample sizes, those within each college, cannot.

We also wanted to see if the treatment affected whether or not a student's Cumulative GPA rose above 2.0. Below is a table summarizing our findings:

*Summary of **Cumulative** GPA (Percent above 2.0)*		% GPA above 2.0 ***Control***	% GPA above 2.0 ***Treatment***	Treatment vs. Control ***p-value***
College	**CAFES**	30.2%	47.7%	0.0945*
	OCOB	42.0%	40.0%	0.8759
	CENG	37.5%	52.4%	0.0918*
	COSAM	36.1%	48.5%	0.2983
	Aggregate	35.7%	49.0%	0.0169**

Table 3 – We found that the treatment had a statistically significant effect on the percent of students raising their Cumulative GPA above 2.0.

Raising one's Cumulative GPA gets harder as more classes are taken, therefore we investigated whether the treatment had an effect on their Winter GPA only. Below is a table summarizing the results:

*Summary of **Winter** GPA (Percent above 2.0)*		% GPA above 2.0 ***Control***	% GPA above 2.0 ***Treatment***	Treatment vs. Control ***p-value***
College	**CAFES**	60.5%	63.6%	0.7605
	OCOB	57.1%	53.3%	0.8367
	CENG	48.4%	58.7%	0.2449
	COSAM	61.1%	66.7%	0.6315
	Aggregate	55.4%	61.3%	0.2925

Table 4 – Interestingly, there were no statistically significant differences between the treatment and control group's Winter GPAs.

It seems somewhat contradictory that the Winter GPAs are not significantly different between the control and treatment groups when their Cumulative GPAs are. We attribute this phenomenon to the retroactive grade changes that occur when a class is retaken, artificially inflating the Cumulative GPA.

In the process of checking statistical assumptions for validity, we came across some unexpected differences. Below is a box plot to compare the impact different workshop dates had on the change in student's GPA.

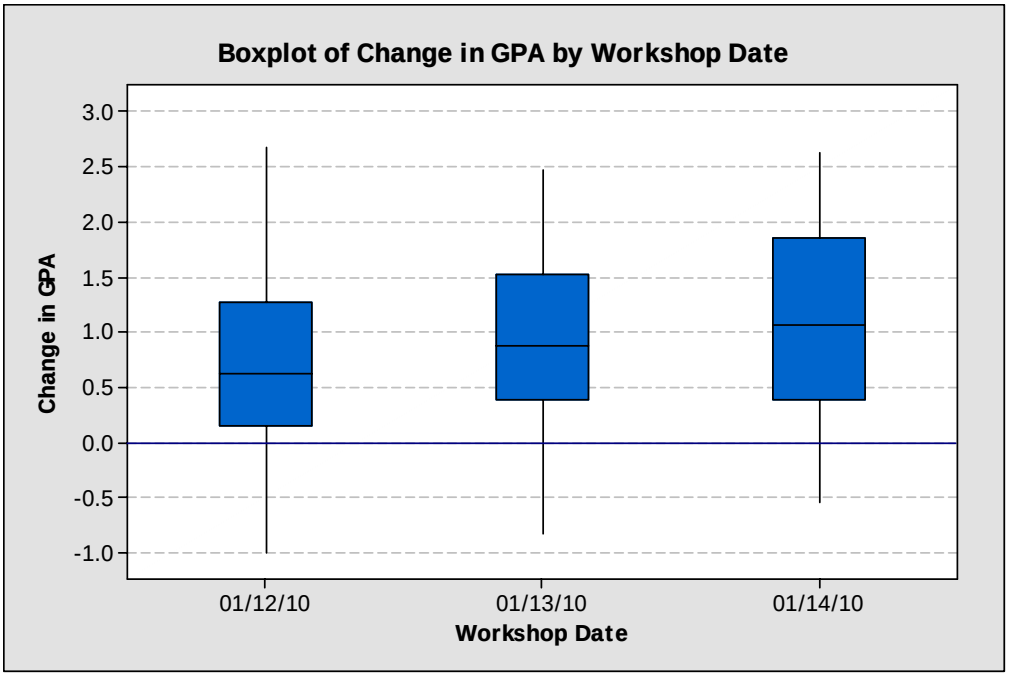


Figure 1 – Above it can be seen that the Change in GPA's seems to the best on January 14th, though these are only moderately significant differences (p-value = 0.0825*).

Since students were not randomly assigned to different workshop dates, we cannot attribute differences in their performance to which workshop they attended. However, if the workshops *were* different from one another in some respects, it could explain the disparity above.

2) Spring Enrollment

Another response we modeled was whether or not a student stayed enrolled in Cal Poly for the spring quarter. Below are bar charts comparing the rate of students enrolled by test group and college:

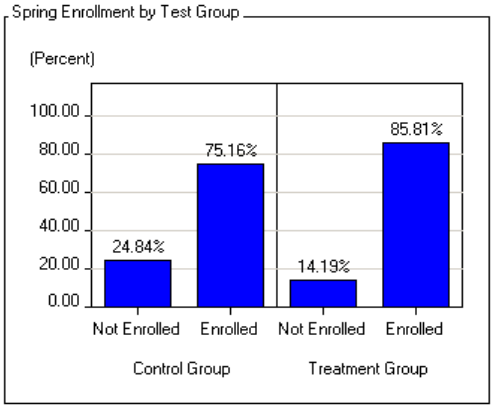


Figure 2 – We can see that the non-enrollment rate is greater for the control group.

Spring enrollment rates were significantly higher for those in the treatment group (p-value = 0.0177**). We found that the odds of staying enrolled spring quarter were about **6.00 to 1** for those in the treatment group, and **3.03 to 1** for the control. In other words the odds of spring enrollment were about **2 times *greater*** for those in the treatment group than those in the control.

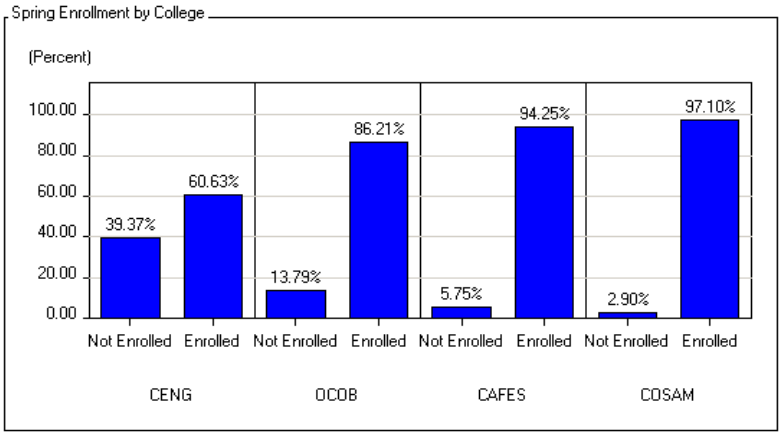


Figure 3 – The non-enrollment rate is much greater in CENG than any other college.

Also, it seemed that a much larger proportion of CENG students did not stay enrolled spring quarter than all other colleges (p-value < 0.0001***). We found that the odds of staying enrolled spring quarter are 10.27 times *less* for those in the College of Engineering than those in the other colleges (1.45 to 1 for those in CENG, and 15.82 to 1 for those in other colleges). See the Appendix for a more detailed table.

Of those who were not enrolled for spring quarter some were disenrolled by disqualification and others voluntarily disenrolled. Below is a table displaying these rates.

Disenrollment	Treatment		Control		Aggregate	
	Count	Percent	Count	Percent	Count	Percent of **All** AP Freshmen
Voluntary	3	13.6%	5	12.8%	8	2.6%
Disqualification	19	86.4%	34	87.2%	53	17.0%
Total	22	36.1%	39	63.9%	61	19.6%

Table 5 – We can see that although there are more disqualifications in the control group (34), the *rate* of disqualification in the control group (87.2%) is very similar to the rate of disqualification in the treatment group (86.4%).

The difference in disqualification vs. voluntary disenrollment rates was not statistically significant (p-value = 0.6928**). In other words, there is no evidence to say that the treatment had an effect on *why* the student was not enrolled.

3) Attitude

An interesting aspect of the self-efficacy index responses was that all indices increased on average except the writing index. However, the writing self-efficacy index decreased significantly less for those in the treatment group. Attitude changes did not seem to be affected by which college the student came from.

Below is a graph displaying box plots comparing the *change in attitude* for each self efficacy index between the treatment and control groups.

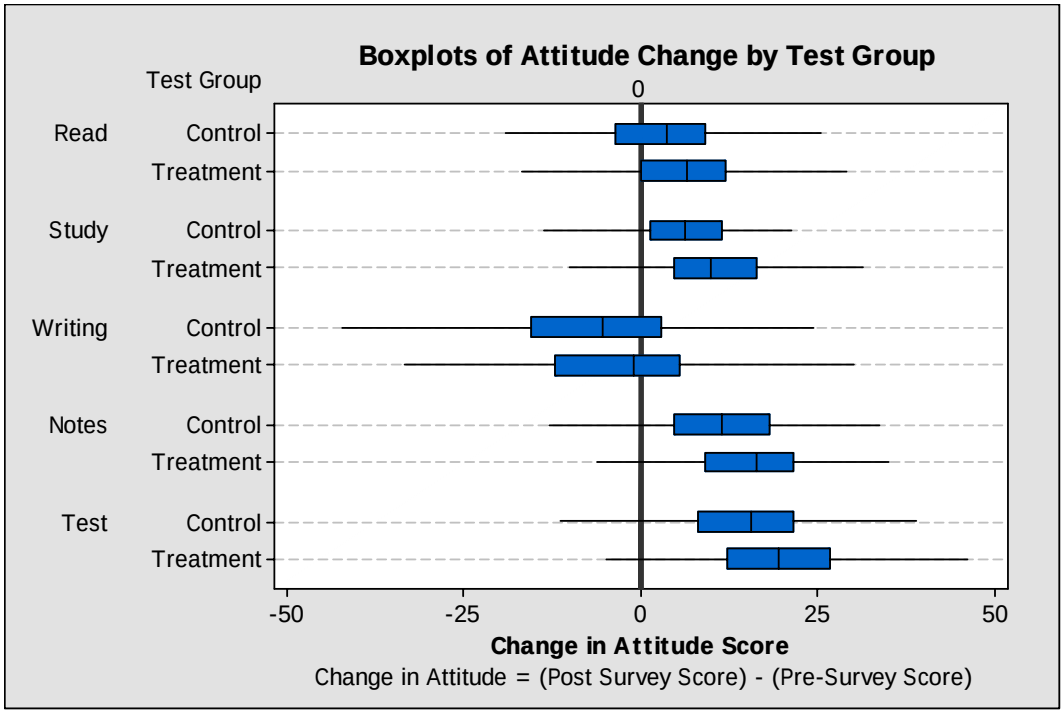


Figure 3 – For each self-efficacy index we can observe a positive shift in attitude change from the control to treatment group.

	Control			Treatment			
Attittude Summary Statistics (Average Scores)	**1st Survey**	**2nd Survey**	**Change in Attitude**	**1st Survey**	**2nd Survey**	**Change in Attitude**	Change in Attitude **Treatment vs. Control** p-values
Reading	68.11	71.33	3.22	71.50	77.94	6.44	0.0410**
Study	64.07	70.39	6.31	66.64	76.92	10.28	0.0045***
Writing	73.67	68.49	-5.18	75.61	74.66	-0.95	0.0523*
Note Taking	57.27	68.55	11.28	59.35	75.30	15.94	0.0016***
Test Prep	52.35	67.09	14.74	54.56	74.13	19.56	0.0018***

Table 6 – The post treatment survey responses were compared to the pre-treatment survey responses for each attitude index. Only those students who took the 1st survey *before* the workshop were considered valid for comparisons.

V. Appendix

Control Conditions by College

CENG – The students in the control group received an email encouraging them to take advantage of College of Engineering's free tutoring and other campus resources, in addition to the option of seeking help from the college advisors.

OCOB – The students in the control group were required to go to a workshop in addition to seeking help from college advisors. OCOB students were, in effect, given the pilot intervention in their college, but in smaller groups.

CAFES – The students in the control group received an invitation to a intervention workshop (not required) and a required visit to their college advisor to develop an action plan. They were also required to fill out a blackboard online survey.

COSAM – The students in the control group received an invitation to an intervention workshop in addition to the option of seeking help from college advisors.

Sample distribution by Workshop Date

Workshop Date Distribution		**Attendance**
Workshop Date	**1/12/2010**	63
	1/13/2010	69
	1/14/2010	23
	Total	155

Figure 4 – Note that the total number of students who attended the workshop is five less than the number of students in the treatment group. This is because five students from the treatment group did not attend a workshop. There was a 97% attendance to the workshop.

Survey Completion Rates

Survey Completion		**Treatment**		**Control**		**Aggregate**	
		Completed	% of Group	Completed	% of Group	Completed	% of Sample
Survey	1st	145	91%	150	96%	295	93%
	2nd	134	84%	117	75%	243	77%

Figure 5 – This table shows the number of students in the sample to complete the first and second surveys.

Spring Enrollment Rates

Spring Enrollment		Treatment		Control		Group Aggregate	
		Enrolled	% of Group	Enrolled	% of Group	Enrolled	% of College
College	**CAFES**	43	97.7%	39	90.7%	82	94.3%
	OCOB	13	86.7%	12	85.7%	25	86.2%
	CENG	45	71.4%	32	50.0%	77	60.6%
	COSAM	32	97.0%	35	97.2%	67	97.1%
	College Aggregate	133	85.8%	118	75.2%	251	80.5%

Table 7 – This table shows a more detailed view of spring enrollment rates.

Memorandum

To: Kris McKinlay

From: Profs. Heather Smith & Matt Carlton, Statistics Department

Author: Huey Dodson

Date: 8/23/2010

Re: Academic Coaching Study – Year End

Contents

I. Executive Summary
II. Introduction
III. Methodology
IV. Results

I. Executive Summary

In the previous Academic Coaching analysis there were many significant differences between the treatment and control groups. Each of the responses of interest (GPA, Spring Enrollment, and Self-Efficacy) proved to be significantly different between the two groups. Some of these differences persisted into the spring quarter and some did not.

Spring quarter GPA performance was the first response investigated. Despite the significant differences between the two groups' cumulative GPAs in the winter, neither their spring term nor cumulative GPAs were significantly different. However, the proportion of students with a cumulative GPA above 2.0 at the end of spring quarter was significantly higher (p-value = 0.0307) for those who received the Academic Coaching treatment.

The next response of interest was Fall 2010 enrollment. The fall enrollment rate of students in the treatment group was significantly higher (p-value = 0.0909) than those in the control group. However, within the OCOB and COSAM the control group actually had a higher enrollment rate, though the difference was not statistically significant.

Self-Efficacy was not assessed in the spring quarter and so was not addressed in this analysis.

II. Introduction

At the end of the winter quarter we observed the effects of an academic coaching seminar and related communications on the performance, attitude, and participation of the students in the study. Now that the spring quarter has ended we can see what trends and effects persisted.

Preliminary memos (02/10/10 & 05/07/10, A. Herrington & H. Dodson) were written describing the survey results from the first survey and the change in the attitudes and performance of the students in the study. This memo describes the effects and trends observed at the end of the academic year.

III. Methodology

In the previous memo, analysis of GPA, Enrollment, and Attitude responses were presented as the change from fall to winter. In this memo, we investigate if the observed treatment effects from fall to winter persisted into the spring.

Since some students did not enroll for the spring quarter, it isn't possible to observe their GPA change in the spring or their Fall 2010 enrollment rates. Thus, for some of the analyses contained in this memo, a subset of the original group of students is used: those students who enrolled for Spring 2010 or Fall 2010. Of the 312 students enrolled winter quarter, 251 of them were enrolled for spring quarter. Below is a table describing the student distribution of the "spring subset."

Spring Student Subset		Treatment	Control	Total
College	**CAFES**	43	39	82
	OCOB	13	12	25
	CENG	45	32	77
	COSAM	32	35	67
	Aggregate	133	118	251

Table 1 – Student spring enrollment broken down by college and experimental group.

Listed below are the responses of interest and the ways in which these responses might have been affected.

1) **GPA**
   - **a.** By Treatment Group
   - **b.** By College
   - **c.** By Quarter
2) **Fall 2010 Enrollment**
   - **a.** By Treatment Group
   - **b.** By College
   - **c.** By Quarter

Since there was not a self-efficacy survey taken in the spring quarter, there is no corresponding continuing analysis in this memo.

IV. Results

In order to aid the communication of statistical significance, the following asterisk code is used to point out significant p-values:

* indicates a p-value between 0.10 and 0.05
** indicates a p-value between 0.05 and 0.01
*** indicates a p-value less than 0.01

1) GPA

This section describes findings about the changes in students' GPAs. Table 2 below summarizes the findings. Note that the "Change in GPA" statistic is not the difference between the average winter and spring GPAs, but the average of the difference between the winter and spring GPAs for *each student.* As a result, those changes are limited to the spring subset.

		Control				Treatment				Treatment vs. Control	
Mean Term GPA		Fall GPA	Winter GPA	Spring GPA	Change (Winter to Spring) GPA	Fall GPA	Winter GPA	Spring GPA	Change (Winter to Spring) GPA	Spring GPA p-value	Change (Winter to Spring) GPA p-value
College	CAFES	1.492	2.102	2.050	-0.095	1.463	2.328	2.223	-0.067	0.2446	0.8671
	OCOB	1.417	2.311	2.204	-0.205	1.609	2.258	2.517	0.152	0.1799	0.2308
	CENG	1.323	1.897	2.252	-0.402	1.347	2.144	2.077	-0.402	0.3264	0.9975
	COSAM	1.371	2.128	2.064	-0.128	1.387	2.491	2.360	-0.114	0.0984*	0.9498
	Aggregate	1.389	2.042	2.124	-0.200	1.414	2.280	2.236	-0.169	0.2125	0.7564
		Full Set		Spring Subset		Full Set		Spring Subset			

Table 2 – GPA performance broken down by experimental group, college, and quarter.

As Table 2 illustrates, the GPA performance in the spring quarter is quite different from what was observed in the winter. In the previous analysis, we observed marked increases in GPA across all subgroups from fall to winter, with the treatment group increasing significantly more. What we observe now is a slight, consistent decrease in GPA from winter to spring, with no significant difference between the treatment and control groups.

Figure 1 tracks the average term GPA of the treatment and control groups by quarter. Observe the larger difference in winter term GPA and a smaller difference in the spring.

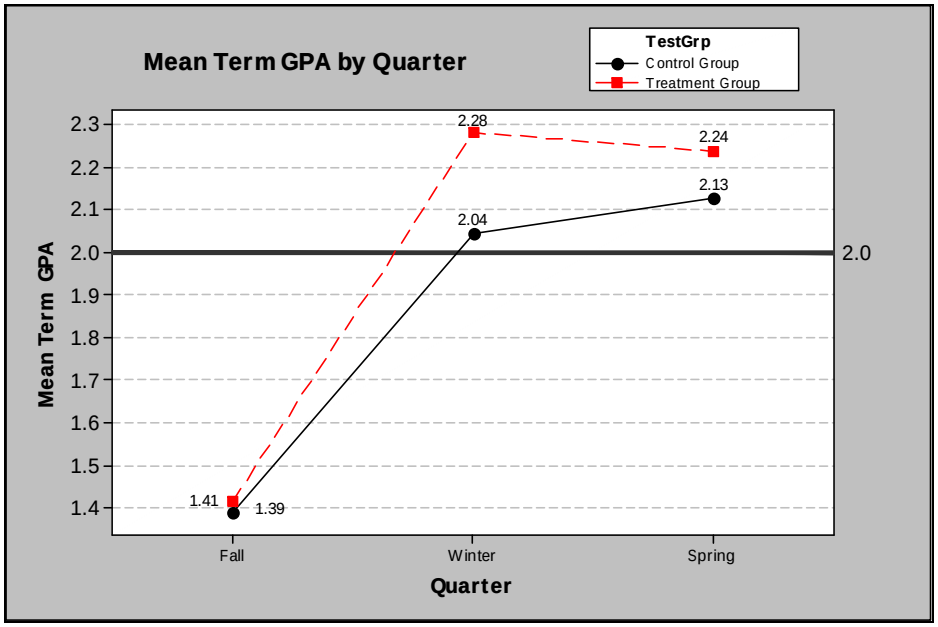


Figure 1 – Legend: Term GPA trend for Treatment and Control Groups.

We also wanted to see if the treatment affected whether or not a student's cumulative GPA rose above 2.0. We found that continuing into the spring, the treatment had a statistically significant effect on the percent of students maintaining their cumulative GPA above 2.0. Table 3 summarizes the results.

Summary of ***Cumulative*** *GPA (Spring Quarter)*		% GPA above 2.0 ***Control***	% GPA above 2.0 ***Treatment***	Treatment vs. Control ***p-value***
College	**CAFES**	58.97%	65.12%	0.3650
	OCOB	58.33%	84.62%	0.1551
	CENG	78.13%	77.78%	0.6201
	COSAM	51.43%	75.00%	0.0403**
	Aggregate	61.86%	73.68%	0.0307**
Spring Subset				

Table 3 – Cumulative Spring GPA broken down by experimental group and college.

With a p-value of 0.0307, there is strong evidence that the academic coaching treatment increases the proportion of students having a cumulative GPA greater than 2.0 at the end of spring quarter.

2) Fall 2010 Enrollment

This section describes Fall 2010 enrollment rates and enrollment trends of AP freshmen throughout the 2009-2010 school year. As seen in Figure 2, the control group has a consistently lower enrollment rate than the treatment group.

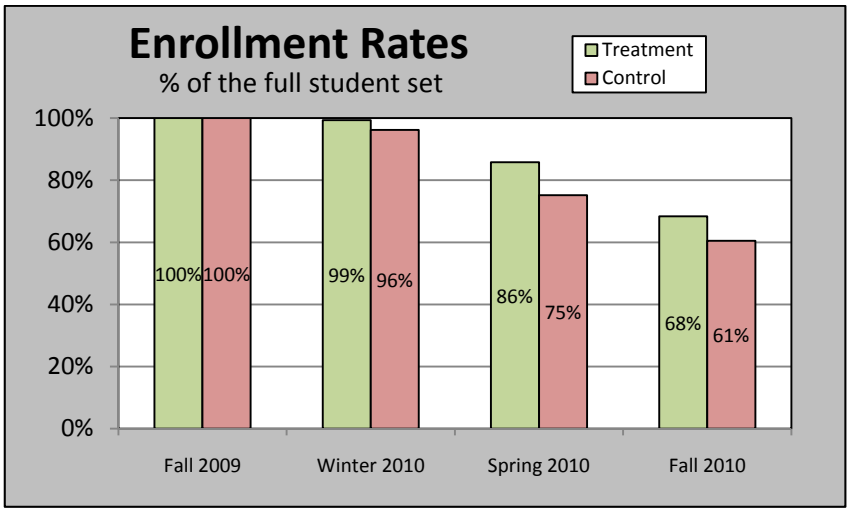


Figure 2 – Percent of full student set enrolled by experimental group and quarter.

From the last analysis. we observed that there was a significant difference in the enrollment behavior between different colleges. To this point, Table 4 shows enrollment rates broken down by college and experimental group.

		Treatment		Control		Group Aggregate		Treatment vs. Control
Fall 2010 Enrollment		Enrolled	% of Group	Enrolled	% of Group	Enrolled	% w/in College	p-value
College	**CAFES**	33	75.0%	28	65.1%	61	70.1%	0.2200
	OCOB	10	66.7%	10	71.4%	20	69.0%	0.7501
	CENG	35	55.6%	23	35.9%	58	45.7%	0.0204**
	COSAM	28	84.9%	34	94.4%	62	89.9%	0.9591
	Aggregate	106	68.4%	95	60.5%	201	64.4%	0.0909*
		Full Student Set						

Table 4 – Fall 2010 enrollment broken down by experimental group and college. Percentages are of the entire student set, *not* the spring subset.

With a p-value of 0.0909, there is evidence that the academic coaching treatment increased the proportion of students that stayed enrolled into their sophomore year. Observe that in the OCOB and COSAM, the Fall 2010 enrollment rates are actually higher for the control group, but not to a statistically significant degree.

Memo

To:	Academic Advising Council
From:	Ryan Allison
Edited by:	Matt Carlton, Statistics Department
Date:	5/26/2011
Re:	Freshman Success Program

Contents

I. Introduction

II. Summary

III. GPA and Academic Probation Results

IV. Self-Efficacy Results

V. Appendix

I. Introduction

This memorandum documents the statistical analysis for the Freshman Success Program (FSP) for Winter 2011. The information contained in this memo is meant to assist in measuring the effectiveness of the program in retaining Cal Poly freshmen and increasing GPAs of students on academic probation (AP).

Freshmen who were on AP for their first quarter at Cal Poly (Fall 2010) were required to attend an academic success workshop. We investigated the effects of the workshop on students' self-efficacy and academic performance. The responses investigated were: GPA, AP status, retention, and self-efficacy.

It should be noted that in total, there were 313 freshmen on academic probation (AP) their first quarter at Cal Poly, Fall 2010. Among them, 6 students withdrew from the university after the Fall 2010 term. As these students were not retained, these students have been removed from analysis. Also, 25 out of the 313 freshmen did not attend a workshop. Since these students did not receive any "treatment" of the workshop, these students have also been removed from any analysis. This gives a total of 283 students in the analysis. For information on the full breakdown of the 313 students, refer to Table 8 in the appendix. For information regarding the 25 students who did not attend a workshop, please refer to Table 9.

II. Summary

The freshman success workshop "treatment" had a statistically significant effect in increasing the mean Winter GPA for all colleges. Similarly, the workshop treatment also had a significant effect in increasing all five dimensions of self-efficacy for students. Details appear in Section III. Interestingly, unlike both the control and treatment groups for 2010, the 2011 cohort indicated positive average changes of self-efficacy in all five dimensions; see Section IV for details.

III. GPA and Academic Probation Results

Below are summary statistics for the Winter 2011 FSP participants, compared with the Winter 2010 treatment and control groups. This year's FSP cohort is comparable on all measures below to the Winter 2010 "treatment" group (that is, students who were randomly assigned to the workshop) and thus performing better than the 2010 control group. Comparative statistics are provided in Table 1.

	2011	2010 Treatment Group	2010 Control Group
Mean Change in GPA	0.640	0.563	0.400
% Enrolled Spring 2011	93%	94%	86%
% Off AP	50%	49%	36%
Winter Cum GPA	1.965	1.990	1.817

Table 1 – Summary statistics for the Winter 2011 FSP participants, and comparative statistics for the treatment and control groups from last year's study.

Table 2 summarizes retention into Spring 2011 for the students who participated in the FSP workshop, separated by college. For further enrollment and retention information, including those students who did not attend the workshop, please refer to Table 8 in the appendix.

		Enrolled Spring 2011	Not Enrolled Spring 2011	Total	% Retained
College	CAED	14	1	15	93%
	CAFES	48	5	53	91%
	CENG	66	3	69	96%
	CLA	38	0	38	100%
	COSAM	49	6	55	89%
	OCOB	49	4	53	92%
	Total	264	19	283	93%

Table 2 – Retention data (Spring 2011) for students that participated in the FSP workshop.

Table 3 summarizes the AP status of workshop participants. Note that 141 out of 283 students (49.8%) were able to get off academic probation at the end of Winter 2011.

AP Breakdown for 2114 Term		Off AP	Still On AP	Total	% Off AP
College	CAED	10	5	15	67%
	CAFES	29	24	53	55%
	CENG	29	40	69	42%
	CLA	22	16	38	58%
	COSAM	22	33	55	40%
	OCOB	29	24	53	55%
	Total	141	142	283	50%

Table 3 – AP status summary (end of Winter 2011) for students that participated in the FSP workshop.

Table 4 shows the Fall 2010 term, Winter 2010 term, and Winter 2010 cumulative GPAs of students that participated in the FSP workshop. All colleges showed statistically significant improvements in the change in GPA from fall to winter after the academic success workshop. Note that the aggregate mean winter term GPA (2.207) is significantly higher than for fall (1.501), yet the mean cumulative GPA (1.965) is still low enough to be classified under Academic Probation.

		Fall 2010 GPA	Winter 2011 GPA	Cum GPA	Change in GPA
College	CAED	1.477	2.416	2.250	0.938
	CAFES	1.480	2.353	1.982	0.873
	CENG	1.454	1.822	1.817	0.369
	CLA	1.695	2.321	2.044	0.626
	COSAM	1.354	2.279	1.937	0.925
	OCOB	1.590	2.363	2.034	0.774
	Aggregate	1.501	2.207	1.965	0.706

Table 4 – GPA summary of FSP participants.

IV. Self-Efficacy Results

Students took an online self-efficacy survey before attending the workshop ("First Survey"), and then again a few weeks after attending the workshop ("Second Survey"). Each of the five scores is on a 100-point scale. For Winter 2011, there was a statistically significant effect of the FSP workshop upon self-efficacy for all five dimensions. Similar to last year, writing showed the lowest change in self-efficacy among the five dimensions. Results are summarized in Table 5.

Winter 2011 (Average Scores)	First Survey	Second Survey	Change in Score
Reading	72.40	77.42	5.07
Study	72.81	78.12	5.38
Writing	77.69	80.24	2.49
Note-Taking	71.53	77.36	5.83
Test Prep	72.06	77.89	5.88

Table 5 – Average self-efficacy scores: pre-workshop, post-workshop, and change.

Table 6 compares mean changes in self-efficacy scores between 2011 FSP participants and the treatment and control groups from the 2010 study. Comparing the 2011 data with the changes in scores for the 2010 treatment group, which we'd hope would be comparable, we actually find that all dimensions except for reading are statistically significantly different.

Change in Self-Efficacy (Average Scores)	2011	2010 Treatment Group	2010 Control Group	P-Value 2011 vs. 2010 Treatment Group
Change in Reading	5.07	6.44	3.22	0.208
Change in Study	5.38	10.28	6.31	0.000 *
Change in Writing	2.49	-0.95	-5.18	0.000 *
Change in Note-Taking	5.83	15.94	11.28	0.000 *
Change in Test Prep	5.88	19.56	14.74	0.000 *

Table 6 – Change in self-efficacy for the 2011 cohort and the 2010 treatment and control groups, plus a statistical comparison of the 2011 cohort to the 2010 treatment group. An asterisk (*) denotes a statistically significant P-value.

Note in particular that there was a decrease in writing self-efficacy for both the treatment and control groups in 2010 (though less pronounced for the treatment group). However, the 2011 FSP participants indicated a positive change in self-efficacy in this dimension. The changes for 2011 are also much more consistent than in the previous year (ranging from +2.49 to +5.88, compared to much greater variation last year).

Table 7 partly explains the disparity between this year's and last year's self-efficacy findings. While there were no negative changes in self-efficacy this year, the 2011 group of students had a much higher baseline for self-efficacy. In particular, the baseline mean self-efficacy scores for the study, note-taking, and test preparation dimensions were all statistically significantly different than last year's. This does not, however, explain the disparity in "change in writing" scores between 2011 and 2010 indicated in Table 6.

First Survey Self-Efficacy (Average Scores)	2011	2010 Treatment Group	2010 Control Group	P-Value 2011 vs. 2010 Treatment Group
Reading	72.30	71.50	68.11	0.441
Study	72.85	66.64	64.07	0.000 *
Writing	77.46	75.61	73.67	0.977
Note-Taking	71.57	59.35	57.27	0.000 *
Test Prep	72.13	54.56	52.35	0.000 *

Table 7 – Comparison of First Survey ("baseline") self-efficacy scores for 2011 and 2010. P-values marked by an asterisk (*) indicate dimensions wherein the 2011 mean scores were statistically significantly different than the 2010 scores.

V. Appendix

Table 8 shows the breakdown of students by workshop attendance as well as enrollment and AP status. Please note that there are 3 students who did not attend a workshop that are not enrolled for Spring 2011, which were included in the previously stated 22 students who withdrew from the university after the Winter 2011 term.

Attended Workshop	Enrolled for Winter 2011	Enrolled for Spring 2011	Off AP	N
No	Yes	No	No	3
		Yes	No	13
			Yes	8
	No	Yes	No	1
Yes	Yes	No	No	19
		Yes	No	123
			Yes	141
	No	No	No	4
		Yes	No	1
			Total	313

Table 8 – Sample size disaggregation by workshop attendance, enrollment status for Winter 2011 and Spring 2011, and AP status at the end of Winter 2011.

Finally, Table 9 summarizes the GPAs of the 25 students who were enrolled Winter 2011 but did not attend a workshop. Note that 68% of the students (17/25) that did not attend a workshop are still on academic probation, compared to just 50% of workshop participants.

Off AP	Number of students	GPA Category	GPA
No	17	Fall 2010 GPA	1.524
		Winter 2011 GPA	1.338
		CP Cum GPA	1.528
Yes	8	Fall 2010 GPA	2.041
		Winter 2011 GPA	2.433
		CP Cum GPA	2.301

Table 9 – GPA summary for students enrolled Winter 2011 that did not participate in the FSP workshop.