LATINO/A EMPOWERMENT AT DE ANZA PROGRAM EVALUATION

Prepared for De Anza Community College

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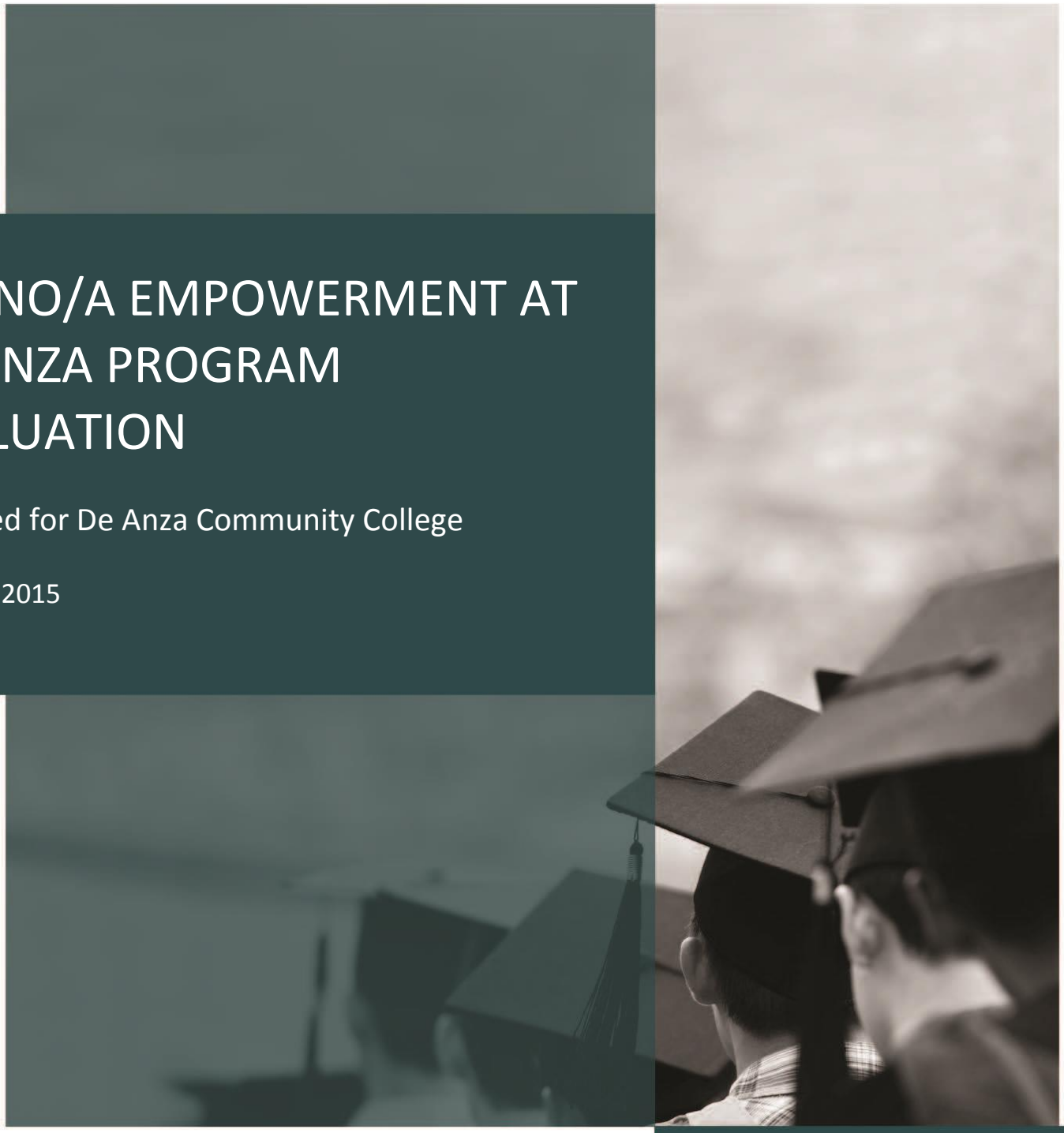

In the following report, Hanover Research evaluates the impact of student involvement in Latina/o Empowerment At De Anza (LEAD) on academic outcomes at De Anza Community College.

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EXECUTIVE SUMMARY AND KEY FINDINGS

In this report, Hanover Research evaluates the impact of student involvement in Latina/o Empowerment At De Anza (LEAD) on academic outcomes at De Anza Community College ("De Anza"). For each LEAD participant, Hanover identifies a non-LEAD peer based on observed student characteristics and uses these non-LEAD peers to form "control" groups to compare with the "treatment" groups comprising LEAD participants. The analysis concentrates on LEAD participants, i.e., students who have enrolled in a LEAD-affiliated course at least once. Figure ES.1 summarizes the distribution of De Anza students by LEAD status.

Figure ES.1: De Anza Students by LEAD Participation

LEAD Status	Number of Students (Total N=28,173)
LEAD participant	1,144 (4.0%)
Non-LEAD student	27,029 (94.9%)

The report comprises three sections and an appendix that includes full regression estimates. Section I explains the process we use to identify non-LEAD peers as well as our analytical methodology. Section II analyzes the relationship between student participation in LEAD and course-related outcomes, such as term GPA and pass rate. Finally, Section III discusses additional academic outcomes, such as degree completion, term-by-term enrollment persistence, and transfer to a four-year institution. Supplemental findings from interviews with nine current and alumnae LEAD student mentors contextualize our analysis.

KEY FINDINGS

- **When enrolled in a LEAD course, students have higher overall GPAs and pass rates than non-LEAD students for all courses taken during the same term.** On average, when students are taking a LEAD course, their concurrent term GPA is 0.16 points higher and their concurrent course pass rate is 2.9 points greater than non-LEAD students. Additionally, students who take two LEAD courses have an even higher overall GPA (0.67 points) for the term in which they are enrolled. However, these positive effects do not persist to subsequent terms at De Anza.
- **Further, there is no significant difference between LEAD and non-LEAD student performance in STEM courses.** This effect is evident both when students are enrolled in LEAD courses and during subsequent terms.

- **When compared to their non-LEAD peers, LEAD participants are less likely to attain a degree or certificate at De Anza or to transfer to a four-year institution.**
  - LEAD participants are 9.1 percentage points less likely to complete a degree than their matched non-LEAD peers and 13.6 percentage points less likely to transfer to a four-year institution. However, LEAD participants enroll continuously for 0.47 terms longer than non-LEAD peers.
- **Qualitative findings from interviews with LEAD mentors indicate that students are fervently supportive of the LEAD program and its emphasis on community building and support.** Participants report a number of specific benefits associated with LEAD participation, including increased engagement in class, awareness of social justice issues, development of leadership skills, direct access to De Anza leadership, understanding of institutional procedures, access to alumni networks, and support for adult learners.
- **Many respondents consider *familia* among the most important developmental components of the LEAD program.** Respondents describe how *familia* permeated all the experiences and interactions they had in LEAD by creating strong bonds between students, faculty, and alumni.
- **Analysis indicates that the positive effects of LEAD do not persist to subsequent terms; this finding may reflect the degree to which students feel unsupported outside of their LEAD classes.** Students spoke highly of the collaborative and engaging LEAD classroom atmosphere and the close relationships they developed with professors, stating that these factors had a significant role in their increased performance in the quarters during which they participated in LEAD. However, several students noted that other courses at De Anza did not foster a collaborative learning environment, which made it difficult for them to feel as engaged as they had in their LEAD classes.

CONCLUSION

From this analysis, Hanover concludes that participating in LEAD courses improves student GPA in the concurrent term. Further, participation in LEAD improves student retention. However, LEAD participants are less likely to graduate or transfer to a four-year institution compared to similar students who did not participate in the LEAD program. Nonetheless, LEAD participants report being more engaged and feeling more academic accountability because of their participation in the LEAD program, suggesting that LEAD's benefits may extend beyond purely quantitative measures of academic success.

SECTION I: DATA AND METHODOLOGY

DATA OVERVIEW

To study the effects of LEAD participation on student academic outcomes, Hanover Research uses De Anza student data, which includes information on students' academic and demographic backgrounds as well as their academic performance. These data span the summer term of the 2010-11 academic year through the fall term of the 2014-15 academic year. Data on student performance in courses at De Anza are provided at the sequence or section level; therefore, one course could account for multiple sections. Depending on the nature of the variables, student background information is provided at either the student-term or student level. This report analyzes data at the student-term level, where each observation represents one term during which a student was enrolled at De Anza.

Figure 1.1 summarizes enrollment by year and term. In total, this report analyzes 183,338 student-term records from 2011 to 2015. Because the 2014-15 academic year was still in progress when the data was sent to Hanover, data are only available for the summer and fall terms.

Figure 1.1: Enrollment Distribution by Year and Term

Year	Term				
	Summer	Fall	Winter	Spring	Total
2011	6,479	10,144	10,118	10,119	**36,860**
2012	7,229	11,808	11,481	11,226	**41,744**
2013	8,042	12,542	12,131	11,901	**44,616**
2014	7,661	12,453	11,817	11,462	**43,393**
2015[1]	6,158	10,567	0	0	**16,725**
Total					**183,338**

DEPENDENT VARIABLES (OUTCOMES)

This study uses term grade point average (GPA), pass rate, and term GPA in STEM courses to analyze three dependent variables or outcomes: student performance in courses, likelihood of attaining a degree or certificate from De Anza, and enrollment persistence from term to term.[2] Additionally, the report presents outcomes across two groups of students at De Anza: LEAD participants and non-LEAD students. The report analyzes whether students enrolled in LEAD-affiliated courses have different outcomes from those who do not participate in LEAD. In total, there are 7,723 LEAD student records and 175,615 non-LEAD student records.

As Figure 1.2 demonstrates, LEAD participants have lower overall GPAs than non-LEAD students. Specifically, these students have an average term GPA of 2.7 compared to a corresponding GPA of 2.9 among non-LEAD students. There is a similar disparity between LEAD and non-LEAD students in term pass rate: the average term pass rate among LEAD

[1] Student information is only available for the first two terms of the 2014-15 academic year.
[2] STEM stands for Science, Technology, Engineering, and Math.

participants is approximately 73 percent, which is lower than the 77 percent pass rate among non-LEAD students.[3] Further, in all term-level records, LEAD participants are less likely to attain a degree or certificate than non-LEAD students. However, term-to-term persistence is similar among all student groups, with the average student enrolling in seven continuous terms.

Figure 1.2: Comparing Outcomes by LEAD Status

Outcome	LEAD Participants		Non-LEAD Students	
	Count	Mean/Percent	Count	Mean/Percent
Term GPA in non-LEAD courses	6,737	2.6	157,351	2.9
Overall term GPA	6,817	2.7	157,351	2.9
Term GPA in STEM courses	3,587	2.4	92,204	2.7
Term passing rate[4]	7,384	72.9%	168,111	77.2%
Attained a degree/certificate	883	11.4%	30,270	17.2%
Longest term-to-term persistence	7,723	7.1	175,615	6.9
Totals				
	7,723	100%	175,615	100%

INDEPENDENT VARIABLES (PREDICTORS)

This section uses student participation in the LEAD program to analyze academic outcomes. While analyzing the effects of these predictors, Hanover also controls for additional student characteristics, including academic background, demographic information, and academic activities at De Anza. Figures 1.3(a) through 1.3(d) describe the independent variables included as predictors and controlled for when analyzing the effect of LEAD participation on student outcomes. Within each set of student characteristics, a "missing flag" variable denotes records that are missing information. However, because prior education is the only category in which a significant portion of the student population lacks sufficient data, the report displays a missing flag only when presenting these characteristics.[5]

Figure 1.3(a) summarizes student academic activities at De Anza. The data show that 54.6 percent of active LEAD students take STEM courses compared to 60.1 percent of non-LEAD students. In contrast, 25.1 percent of active LEAD students are enrolled in basic skills classes, which is nearly 6 percentage points higher than non-LEAD student enrollment in these courses (19.2 percent).

[3] Note that records of withdrawal from grade codes were considered in the denominator for calculations of passing rates. Hence, an average passage rate of 72.9 percent indicates that, on average, 27.1 percent of 7,723 LEAD students did not obtain a passing grade, or opted to withdraw.
[4] *Ibid.*
[5] Missing flag variables for parents' education and family income (Figure 1.3(d)) are also omitted from further analyses.

Figure 1.3(a): Academic Activities and Background Characteristics by LEAD Status

Predictor	LEAD Participants		Non-LEAD Students	
	Count	Mean/Percent	Count	Mean/Percent
Participated in LEAD	7,723	100.0%	0	0.0%
Took a STEM course	4,219	54.6%	105,509	60.1%
Took a Basic Skills course	1,940	25.1%	33,632	19.2%
Number of LEAD courses in term	7,723	0.2	175,615	0.0
Number of non-LEAD courses in term	7,723	2.7	175,615	2.8
Number of STEM courses in term	7,723	0.7	175,615	0.9
Total	**7,723**	**100%**	**175,615**	**100%**

Figure 1.3(b) summarizes student age, gender, race/ethnicity, and residency status. Note that since the data do not include an official year of entry, age is computed as the difference between a student's first observed year enrolled at De Anza and birth year. LEAD participants are more likely to be between the ages of 18 and 20 than non-LEAD students, while non-LEAD students are more likely than LEAD participants to be between the ages of 21 and 30. This suggests that LEAD participants are generally younger than their non-LEAD counterparts at De Anza.

When evaluating LEAD participation according to race and ethnicity, Asian and white students are proportionately less likely to participate in LEAD while Latino/a and black students are more likely to participate. For example, Latino/a students make up 22.6 percent of non-LEAD participants but account for 37.4 percent of LEAD participants. Similarly, students who are AB540 non-resident tuition exempt account for 2.9 percent of the non-LEAD student population; however, 5.2 percent of LEAD participants belong to this residency group.

Figure 1.3(b): Comparing Academic and Background Characteristics by LEAD Status

Predictor	LEAD Participants		Non-LEAD Students	
	Count	Percent	Count	Percent
Age Group				
Younger than 18	485	6.28%	11,163	6.36%
Ages 18 to 20	5,574	72.17%	112,429	64.02%
Ages 21 to 25	1,010	13.08%	32,614	18.57%
Ages 26 to 30	261	3.38%	9,714	5.53%
Ages 31 to 45	224	2.90%	7,682	4.37%
Older than 45	83	1.07%	2,013	1.15%
Missing age information	86	1.11%	0	0.00%
Gender				
Female/Missing	3,943	51.06%	83,417	47.50%
Male	3,780	48.94%	92,198	52.50%
Ethnicity				
Native American	7	0.09%	1,303	0.74%
Asian	2,350	30.43%	73,655	41.94%
African American	432	5.59%	7,613	4.34%

Predictor	LEAD Participants		Non-LEAD Students	
	Count	Percent	Count	Percent
Filipino and Pacific Islander	618	8.00%	13,822	7.87%
Latino/a	2,892	37.45%	39,110	22.27%
White	1,165	15.08%	32,317	18.40%
Declined to state/Unknown	259	3.35%	7,795	4.44%
Residency				
Resident	6,490	84.03%	147,317	83.89%
AB540 non-resident tuition exempt	405	5.24%	5,063	2.88%
Non-resident international	659	8.53%	20,482	11.66%
Non-CA US resident	83	1.07%	2,725	1.55%
Missing residency information	86	1.11%	28	0.02%
Total	**7,723**		**175,615**	

Figure 1.3(c) summarizes students' prior educational attainment and education goals. For those students who report duplicate entries in these fields, the figure presents the entry for the *highest level of prior education or educational goal*. Data show that the majority of LEAD participants report a high school diploma as their highest level of educational attainment. When compared to the non-LEAD student population, students who plan to pursue a vocational goal and those who wish to transfer to a four-year institution are proportionally less likely to participate in LEAD.

Figure 1.3(c): Comparing Academic and Background Characteristics by LEAD Status

Predictor	LEAD Participants		Non-LEAD Students	
	Count	Percent	Count	Percent
Prior Education				
Prior education: Bachelor's	109	1.41%	2,953	1.68%
Prior education: Associate's	81	1.05%	2,520	1.43%
Prior education: HS grad	6,242	80.82%	128,314	73.07%
Prior education: GED	452	5.85%	9,764	5.56%
Prior education: HS grad (prior education unknown)	36	0.47%	2,590	1.47%
Missing prior education information	803	10.40%	29,474	16.78%
Educational Goal				
Has vocational goal	86	1.11%	3,414	1.94%
Goal: transfer to 4-year institute	6,388	82.71%	147,610	84.05%
Goal: Associate's no transfer	368	4.76%	7,996	4.55%
Goal: Vocational degree/certificate	96	1.24%	1,326	0.76%
Goal: career preparation	73	0.95%	2,453	1.40%
Goal: undecided	356	4.61%	8,156	4.64%
Goal: 4-year student taking reqs	230	2.98%	4,266	2.43%
Goal: other/missing	212	2.75%	3,808	2.17%
Total	**7,723**		**175,615**	

Figure 1.3(d) summarizes student background characteristics, including parents' education, family income, and whether a language other than English is spoken at home. However, as the figure shows, about 85 percent of students are missing information about their parents'

education, and about 95 percent of students are missing information on family income. Therefore, it is difficult to draw conclusions from these data.

Figure 1.3(d): Comparing Academic and Background Characteristics by LEAD Status[6]

Predictor	LEAD Participants		Non-LEAD Students	
	Count	Percent	Count	Percent
Parents' Education				
Parent 1's education unknown	89	1.15%	1,345	0.77%
Not raised by parent/guardian 1	0	0.00%	43	0.02%
Parent 1: did not graduate HS	285	3.69%	3,576	2.04%
Parent 1: HS grad	255	3.30%	4,407	2.51%
Parent 1: some college	159	2.06%	3,351	1.91%
Parent 1: Associate's degree	105	1.36%	1,875	1.07%
Parent 1: Bachelor's degree	192	2.49%	4,642	2.64%
Parent 1: Graduate or Professional degree	96	1.24%	2,749	1.57%
Parent 1's education missing	6,542	84.71%	153,627	87.48%
Parent 2's education unknown	134	1.74%	1,978	1.13%
Not raised by parent/guardian 2	49	0.63%	813	0.46%
Parent 2: did not graduate HS	284	3.68%	3,718	2.12%
Parent 2: HS grad	238	3.08%	4,191	2.39%
Parent 2: some college	151	1.96%	3,282	1.87%
Parent 2: Associate's degree	90	1.17%	1,854	1.06%
Parent 2: Bachelor's degree	176	2.28%	4,163	2.37%
Parent 2: Graduate or Professional degree	59	0.76%	1,989	1.13%
Parent 2's education missing	6,542	84.71%	153,627	87.48%
Family Income				
No family income	12	0.16%	192	0.11%
Family income: < $25K	128	1.66%	1,694	0.96%
Family income: $25K to 50K	115	1.49%	1,487	0.85%
Family income: $50K to 75K	71	0.92%	1,218	0.69%
Family income: $75K to 100K	41	0.53%	734	0.42%
Family income: > $100K	28	0.36%	894	0.51%
Missing income information	7,328	94.89%	169,396	96.46%
Language other than English spoken at home	261	3.38%	3,787	2.16%
Total	**7,723**		**175,615**	

METHODOLOGY

This multi-phase program evaluation relies heavily on quantitative analysis, which we contextualize with qualitative analysis throughout. Both approaches are summarized in the remainder of this section.

[6] Parents' education, family income, and whether a language other than English is spoken at home are omitted from further analyses due to sparse representation in the data.

QUANTITATIVE APPROACH

Identifying Peer Groups

As indicated above, LEAD and non-LEAD students at De Anza vary in their academic and demographic characteristics. Therefore, to study the effect of LEAD participation on student outcomes more precisely, it is important to identify a LEAD comparison group that is most similar to non-LEAD students at De Anza. Specifically, the report identifies a "control" group that matches closely with LEAD students in observed characteristics. This control group comprises students who enrolled in at least one course section that was also a course that was offered in the LEAD program. For example, EWRT1A is offered as a LEAD section; therefore, students in the comparison group had to have enrolled in a non-LEAD EWRT1A section in order to be included in the control group. To identify the control group within this selection, Hanover uses propensity score matching, in which each student in the "treatment" group is matched to a non-LEAD counterpart. While students are matched at the term level, this process is equivalent to matching at the student level since the relevant student characteristics do not vary across terms.[7]

Propensity score matching uses similarities in students' academic and demographic characteristics to match LEAD participants with non-LEAD students.[8] The objective is to create control groups that are nearly identical to LEAD participants in those observed characteristics that may influence students' choice to join LEAD.

The method estimates a logistic regression model that predicts whether a student participates in LEAD, using observed characteristics as predictors. In addition to identifying which characteristics are the best predictors of whether the student participates in LEAD, the propensity score matching measures how well the entire group of student characteristics predicts LEAD membership. If the model provides a reasonable prediction, then the resulting equation — using the given model estimates — is used to assign students' scores that represent their predicted probability, or "propensity," of being in LEAD. Then, Hanover matches each LEAD participant with a non-LEAD peer that has the closest propensity score.

Examining Peer Groups

Overall, Hanover matched 7,603 LEAD participants to non-LEAD peers. Figure 1.4 compares the outcomes of LEAD participants with their matched peers. Similarly, Figure 1.5 compares the academic and background characteristics of these corresponding groups.

Figure 1.4 presents student outcomes among LEAD participants and their matched non-LEAD peers. Most notably, LEAD participants are 13 percentage points less likely to attain a degree or certificate at De Anza. However, because the propensity score model identifies

[7] We allow parents' education and family income to vary over time for each student, but these variables are not used to match students due to their sparse availability.

[8] Figures 1.3(a) through 1.3(d) describe these characteristics.

control groups by matching students on observed control variables only, outcome disparity between treatment and control groups is not unexpected.

Figure 1.4: Comparison of Outcomes between LEAD Participants and Non-LEAD Students

Outcome	LEAD Participants		Matched Non-LEAD Students		Difference
	Count	Mean/Percent	Count	Mean/Percent	
Term GPA in non-LEAD courses	6,633	2.6	6,893	2.7	0.1
Overall term GPA	6,711	2.7	6,893	2.7	0.1
Term GPA in STEM courses	3,543	2.4	3,586	2.5	0.1
Term passing rate	7,269	72.8%	7,232	73.2%	0.4%
Attained a degree/certificate	867	11.4%	1,855	24.4%	13.0%
Longest term-to-term persistence	7,603	7.1	7,603	6.8	-0.3
Totals					
	7,603	100%	7,603	100%	---

In general, the academic and demographic characteristics of LEAD participants and their matched peers correspond closely (Figures 1.5, below). In the categories that represent a small proportion of students, there are relatively large percentage differences between the treatment and control groups. The most noticeable difference is that non-CA U.S. residents are much more likely to participate in LEAD. However, because there are so few students in these categories, the matched peers still closely resemble LEAD participants in the observed characteristics.

Figure 1.5: Comparison of Academic and Demographic Characteristics between LEAD Participants and Non-LEAD Students

Predictor	N=7,603		Difference
	LEAD Participants	Matched Non-LEAD Students	
	Mean/Percent	Mean/Percent	
Academic Characteristics			
Took a STEM course	54.8%	55.5%	0.7%
Took a Basic Skills course	25.2%	25.6%	0.4%
Number of non-LEAD courses in term	2.7	2.7	0.0
Number of STEM courses in term	0.7	0.7	0.0
Age Group			
Younger than 18	6.4%	6.5%	0.1%
Ages 18 to 20	73.1%	73.6%	0.5%
Ages 21 to 25	13.1%	12.8%	-0.3%
Ages 26 to 30	3.4%	3.5%	0.1%
Ages 31 to 45	2.9%	2.9%	0.0%
Older than 45	1.1%	0.7%	-0.4%
Gender			
Female/Missing	50.5%	50.6%	0.1%
Male	49.5%	49.4%	-0.1%
Race/Ethnicity			
Native American	0.1%	0.1%	0.0%
Asian	30.8%	31.0%	0.2%

Predictor	N=7,603		Difference
	Lead Participants	Matched Non-LEAD Students	
	Mean/Percent	Mean/Percent	
African American	5.7%	5.8%	0.1%
Filipino and Pacific Islander	8.1%	8.4%	0.3%
Latino/a	37.9%	37.9%	0.0%
White	15.3%	15.1%	-0.2%
Declined to state/Unknown	2.1%	1.6%	-0.5%
Residency			
Resident	85.3%	86.2%	0.9%
AB540 non-resident tuition exempt	5.1%	5.2%	0.1%
Non-resident international	8.5%	8.4%	-0.1%
Non-CA US resident	1.1%	0.3%	-0.8%
Prior Education			
Prior education: Bachelor's	1.4%	1.3%	-0.1%
Prior education: Associate's	1.1%	0.9%	-0.2%
Prior education: HS grad	82.1%	83.1%	1.0%
Prior education: GED	5.9%	5.1%	-0.8%
Prior education: HS grad (prior education unknown)	0.5%	0.4%	-0.1%
Missing prior education information	9.0%	9.2%	0.2%
Educational Goal			
Has vocational goal	1.1%	0.9%	-0.2%
Goal: transfer to 4-year institute	84.0%	84.9%	0.9%
Goal: Associate's no transfer	4.8%	4.9%	0.1%
Goal: Vocational degree/certificate	1.3%	0.9%	-0.4%
Goal: career preparation	1.0%	0.7%	-0.3%
Goal: undecided	4.7%	4.8%	0.1%
Goal: 4-year student taking reqs	3.0%	2.8%	-0.2%
Goal: other/missing	1.2%	1.0%	-0.2%

Regression Modeling

To study the effect of LEAD participation on academic outcomes at De Anza, Hanover applies linear regression models to the data for each treatment-control pair. Thus, each model analyzes LEAD participants and their matched non-LEAD peers. Section III of this report addresses the effect of LEAD participation on non-course outcomes, for example, degree completion, persistence, and transfer.

These regression models isolate the effect of participation in a LEAD course while controlling for student characteristics and differences across years and terms. The following equation summarizes Hanover's modeling methodology:

$$Y_{it} = L_{it} \cdot \beta + X_i \cdot \gamma + Z_t \cdot \phi + \varepsilon_{it}$$

Y_{it} represents the outcome variable for student i in term t. L_{it} represents either a binary indicator for LEAD participation or an interaction term for whether a student took a LEAD

course in a term and the number of LEAD courses taken in that term. In models of success in coursework, this interaction term allows for further analysis of whether taking two LEAD courses in a term affects students differently from taking one LEAD course (Section II). In models of non-course outcomes, L_{it} simply indicates whether a student participated in LEAD, which does not vary by term (Section III). X_i represents either student-level fixed effects (Section II) or student academic and background characteristics (Section III). The inclusion of student fixed effects means including an indicator variable for each student, which controls for any variation across students, not just in the observed characteristics. However, because they would control out any variation in LEAD participation among students, fixed effects are not included in models of non-course outcomes. Z_t represents the year and term-level fixed effects, which controls for variation in outcomes due to time trends, and ε_{it} is the error term.

The estimated values of β are the regression estimates of interest. These values tell us how taking a LEAD course (or two) affects academic outcomes. Therefore, in a regression of persistence on LEAD participation, LEAD participants have longer enrollment persistence by β-terms than their non-LEAD peers.

QUALITATIVE APPROACH

In order to supplement our quantitative analysis, Hanover also invited 36 current and alumnae LEAD program mentors to participate in phone interviews. Of this sample, nine agreed to participate in follow-up, in-depth interviews. Interviewers asked respondents about LEAD student outcomes, the value of LEAD's four fundamental components (curriculum, *familia*, community service, and social justice), the support LEAD receives from stakeholder groups, and LEAD's relationship with the community. Findings from these interviews are included throughout the remainder of our analysis in order to contextualize and add depth to the quantitative findings.

During the in-depth-interview phase, participants responded to the following questions:[9]

- Do you identify as a LEAD student/alumni member?
- Keeping in mind the four developmental components of LEAD – curriculum, *familia*, community service, and social justice – how would you broadly describe the value students get from the LEAD program?
- What would you say is the most important aspect of LEAD?
- Has LEAD improved your experience as a student at De Anza?
- Would you say that LEAD helps you to be a better student? How so?
- Does LEAD increase your view of your own academic ability?
- Has LEAD changed your goals and aspirations?

[9] For alumni participants, interviewers asked questions relating to student experiences in the past tense. Further, questions were adapted and/or modified as necessary to fit the flow of each individual interview.

- Overall, what supports do you get from the LEAD program? How do these supports help you succeed?
- How would you describe the value that each of the following actors provide to the LEAD program?
  - LEAD course faculty
  - LEAD mentors
  - LEAD alumni
  - The Multicultural Center and Institute of Community and Civic Engagement
- Has LEAD has changed the amount of community engagement you're involved in?
- What is the perceived value of being a LEAD mentor?
- Do you recruit new students into the program? How?
- Can you think of any additional areas of value you associate with LEAD?
- Do you have any suggestions for increasing the value that students gain from the LEAD program?

SECTION II: EFFECTS OF LEAD PARTICIPATION ON COURSE SUCCESS

This section discusses student outcomes that are specifically related to coursework, including term pass rate and term GPA in non-LEAD, STEM, and all courses. All regression models include year, term, and student fixed effects, and the appendix of this report includes estimates that are more detailed for each year and term. Specifically, this section comprises two parts: the first part analyzes the effects of taking a LEAD course on course success in the *current term*, while the second part evaluates student success one or two terms following enrollment in a LEAD course. The goal of these analyses is to identify the long-term academic effects of LEAD course enrollment.

MAIN TAKEAWAYS

- When enrolled in a LEAD course, students have higher overall GPAs and pass rates than non-LEAD students for all courses taken during the same term. This effect is even more pronounced in students taking two LEAD courses. Nonetheless, these positive effects do not persist to subsequent academic terms.
- There is no significant difference between LEAD and non-LEAD student performance in STEM courses, either when LEAD participants are enrolled in LEAD courses or in subsequent terms after LEAD course enrollment.
- LEAD mentor interviews suggest that, despite these data findings, students *believe* that LEAD improves academic performance in classes beyond LEAD. Respondents had overwhelmingly positive feedback about the academic and personal development that LEAD fosters.
- Respondents spoke highly of the role that *familia* plays in creating a more compassionate and participatory learning environment. It is therefore important to consider the structure of the LEAD learning environment and the engagement levels it fosters when comparing students' performance during and after LEAD.

SUCCESS WHEN TAKING LEAD COURSES

Figure 2.1 presents a model that estimates various measures of academic success for LEAD participants for the term during which they are enrolled in LEAD coursework. Students who take one LEAD course have a 0.09-point higher GPA in non-LEAD courses taken in the same term and a 0.16-point higher overall term GPA than students who did not enroll in a LEAD course. LEAD students also have a higher pass rate (1.7 percentage points) than students who did not take a LEAD course during the concurrent term. Further, students who took two LEAD courses have a 0.67-point higher term GPA overall than students who did not enroll in any LEAD courses, an even greater margin than students who took just one LEAD course. Nonetheless, taking a LEAD course does not have a statistically significant effect on term GPA in STEM courses.

Overall, students who take STEM courses have significantly lower term GPAs and pass rates than those who do not. However, among students enrolled in STEM courses, those who take *more* STEM courses have a higher STEM GPA. Finally, students who take Basic Skills courses have significantly higher term GPAs and pass rates than those who do not take such courses.

Figure 2.1: Regression Estimates of Current Term Success on LEAD Participation

Predictor	Term GPA in Non-LEAD Courses	Overall Term GPA	Term GPA in STEM Courses	Term Pass Rate
Enrolled in one LEAD course	0.091**	0.160***	0.029	0.029**
	-0.041	-0.038	-0.078	-0.012
Enrolled in two LEAD courses	0.268	0.670***	-0.297	0.105
	-0.323	-0.177	-1.204	-0.068
Number of non-LEAD courses in term	0.110***	0.110***	0.045*	0.024***
	-0.012	-0.012	-0.027	-0.004
Took a STEM course	-0.240***	-0.237***	-	-0.060***
	-0.024	-0.024	-	-0.007
Number of STEM courses in term	-	-	0.086**	-
	-	-	-0.036	-
Took a Basic Skills course	0.148***	0.146***	0.197***	0.046***
	-0.031	-0.03	-0.056	-0.009
Constant	2.640***	2.640***	2.405***	0.765***
	-0.051	-0.051	-0.105	-0.014
Includes year-level fixed effects	Yes	Yes	Yes	Yes
Include term-level fixed effects	Yes	Yes	Yes	Yes
Includes student-level fixed effects	Yes	Yes	Yes	Yes
Observations	**13,526**	**13,604**	**7,129**	**15,206**
R-squared	**0.581**	**0.586**	**0.615**	**0.491**

* p<0.10; ** p<0.05; *** p<0.01. Coefficients estimated using Ordinary Least Squares, with robust standard errors clustered at the student level.

Interviews with LEAD mentors indicate that LEAD participants' success in both LEAD and non-LEAD courses may be a result of the supportive environment that characterizes the LEAD program. Specifically, *familia* within the classroom functions to strengthen feelings of community and accountability, which may extend outside of the LEAD classroom during quarters in which LEAD courses are taken. For instance, one LEAD mentor valued the collaboration and increased sense of community present in LEAD courses,[10] and suggested that students in LEAD courses have a greater sense of community and accountability. Another current LEAD mentor also referenced LEAD's

> *"[LEAD] creates a situation where you want to help other members be better students, and you become better as well.* ***It made me become the leader I was always meant to be."***
> *- LEAD Mentor*

[10] Interview with LEAD student, De Anza Community College. May 12, 2015.

role in increasing her sense of accountability toward herself and her peers.[11] Similarly, an alumna LEAD mentor credits the concept of community or *familia*, as a strength of the program; she characterizes *familia* as being similar to the difference between "I vs. We… individualistic vs. collaborative work." She goes on to note that the support of the *familia* enabled her to improve as a student.[12]

A separate alumna LEAD mentor explains that *familia* shaped relations between students and professors in a way that helped her focus more efficiently on her studies while enrolled in the LEAD program. She states that professors are "ultra-supportive," have a keen sense of *familia*, and are not seen as authoritarian figures. She elaborates: "In [mainstream] classes, you're so used to the distance between a professor and student, but in LEAD, it's more circular. In lectures, there's more open discussion in class."[13]

Thus, interviews with LEAD mentors appear to suggest that LEAD students benefit academically from the supportive environment of the LEAD program. This support system includes their LEAD peers and LEAD professors, who encourage more open collaboration and communication in the classroom. Given the results of the quantitative analysis, it seems probable that the LEAD support network has benefits that extend beyond LEAD courses, as students may encourage and help each other through non-LEAD courses using the close networks formed through LEAD participation.

SUCCESS AFTER TAKING LEAD COURSES

Figures 2.2 and 2.3 present the estimates from academic success models for the two terms following LEAD course enrollment. The results show that LEAD participation does not significantly affect students' overall term GPA, term GPA in STEM courses, or term pass rate in subsequent terms. This suggests that the positive academic effect of LEAD courses does not significantly persist beyond the term in which the courses are taken. However, as previously noted, qualitative research findings indicate that the instructional approaches in these courses may play an important role in student performance. These findings are discussed in greater detail following the presentation of the quantitative analysis in Figures 2.2 and 2.3.

Figure 2.2: Regression Estimates of Current Term Success on LEAD Participation Last Term

Predictor	Overall Term GPA	Term GPA in STEM Courses	Term Pass Rate
Enrolled in one LEAD course in previous term	-0.021	-0.059	0.001
	-0.047	-0.097	-0.016
Enrolled in two LEAD courses in previous term	-0.628	-0.272	-0.063
	-0.453	-0.627	-0.117
Number of non-LEAD courses in term	0.093***	0.023	0.024***
	-0.014	-0.031	-0.004

[11] Interview with LEAD student, De Anza Community College. Telephone interview, May 6, 2015.
[12] Interview with LEAD alumna, De Anza Community College. Telephone interview, May 12, 2015.
[13] Interview with J. LEAD alumna, De Anza Community College. Telephone interview, May 7, 2015.

Predictor	Overall Term GPA	Term GPA in STEM Courses	Term Pass Rate
Took a STEM course	-0.231***	-	-0.051***
	-0.029	-	-0.009
Number of STEM courses in term	-	0.080*	-
	-	-0.043	-
Took a Basic Skills course	0.096***	0.098	0.046***
	-0.036	-0.068	-0.011
Constant	2.646***	2.511***	0.689***
	-0.067	-0.133	-0.022
Includes year-level fixed effects	Yes	Yes	Yes
Includes term-level fixed effects	Yes	Yes	Yes
Includes student-level fixed effects	Yes	Yes	Yes
Observations	**9,818**	**5,395**	**10,527**
R-squared	**0.622**	**0.655**	**0.536**

* p<0.10; ** p<0.05; *** p<0.01. Coefficients estimated using Ordinary Least Squares, with robust standard errors clustered at the student level.

Figure 2.3: Regression Estimates of Current Term Success on LEAD Participation Two Terms Ago

Predictor	Overall Term GPA	Term GPA in STEM Courses	Term Pass Rate
Enrolled in one LEAD courses two terms ago	-0.069	-0.134	-0.025
	-0.054	-0.097	-0.017
Enrolled in two LEAD courses two terms ago	0.356	1.101	0.051
	-0.364	-0.699	-0.112
Number of non-LEAD courses in term	0.096***	0.031	0.028***
	-0.016	-0.034	-0.005
Took a STEM course	-0.236***	-	-0.059***
	-0.033	-	-0.01
Number of STEM courses in term	-	0.078	-
	-	-0.05	-
Took a Basic Skills course	0.122***	0.185**	0.040***
	-0.043	-0.077	-0.012
Constant	2.577***	2.483***	0.673***
	-0.08	-0.162	-0.026
Includes year-level fixed effects	Yes	Yes	Yes
Includes term-level fixed effects	Yes	Yes	Yes
Includes student-level fixed effects	Yes	Yes	Yes
Observations	**8,321**	**4,462**	**8,946**
R-squared	**0.636**	**0.671**	**0.555**

* p<0.10; ** p<0.05; *** p<0.01. Coefficients estimated using Ordinary Least Squares, with robust standard errors clustered at the student level.

Though the quantitative results show that LEAD does not have a significant impact on academic achievement in the long term, qualitative findings suggest students *perceive* that LEAD improves academic performance in classes beyond LEAD. For instance, one current LEAD mentor believes that the program is a factor in student success, noting that the program helps "so many students" discover the best way they learn and encourages them

to implement aspects of the LEAD model in their other classes.[14] Similarly, an alumna LEAD mentor explains that after participating in LEAD, she became more engaged in class discussions, and began to see her education as "not just getting an 'A,' but also seeing how much [she] could get from it, [and] taking ownership of [her own] education a lot more."[15]

However, although one current LEAD mentor also believes that LEAD played an important role in improving her success as a student overall, she acknowledges that she tended to do better in LEAD courses than other courses. She attributes this success to the supportive and collaborative environment of LEAD courses, but not necessarily other college courses.[16] She goes on to note: "Other classes I took at De Anza didn't have those components [and] I wish they did," since they fostered a greater sense of accountability for schoolwork.

Finally, input from one respondent shows that LEAD can, in some cases, help determine the types of courses and majors that students pursue outside of the LEAD program. This current LEAD mentor began her time at De Anza College as a business major. However, once she joined LEAD, she was exposed to environmental initiatives on the De Anza campus, which led her to develop a passion for sustainability and environmental issues.[17] She now leads 10-15 LEAD students each quarter in a sustainable garden initiative that she started with her LEAD peers — something she notes she never would have participated in were it not for her participation in LEAD. Further, her participation in this on-campus sustainability initiative has helped her define her educational goals. She notes, "I was a business major before, but now I'm going into environmental business. It made me want to do more for our ecosystem, our environment, to give a better future for my children and others."

Thus, LEAD mentors believe that participation in LEAD provides academic benefits beyond those that can be measured by quantitative metrics, such as GPA, alone. Students enrolled in LEAD courses often report feeling more engaged and more accountable for their own education as a result of LEAD participation. Further, for students like those quoted above, LEAD participation can lead to better-defined academic goals and aspirations, which may help solidify clear pathways between college and careers.

ADDITIONAL PARTICIPANT FEEDBACK

LEAD's impact extends well beyond academic achievement, as noted by several interview participants. For instance, all nine respondents note that LEAD **increased their awareness of social justice issues** and six specifically cite **increased leadership abilities** and/or feelings of empowerment because of LEAD participation. One current LEAD mentor suggests that the *familia* element of LEAD fosters leadership development and collaboration — two skills that will be vital for employment after college graduation:

[14] Interview with LEAD student, De Anza Community College. May 12, 2015, May 7, 2015.
[15] Interview with LEAD alumna, De Anza Community College. Telephone interview, May 11, 2015.
[16] Interview with LEAD student; May 12, 2015. Op. cit.
[17] Interview with LEAD student, De Anza Community College. Telephone interview, May 5, 2015.

> I came to De Anza and I was here for two years before I came to LEAD. I was quiet and not engaged in my classroom settings; I kept to myself. When I became a LEAD [participant], I blossomed and found my leadership voice. I'm very active on campus now, through the help of the community coming together as a group, and feeling like I'm not alone in my [college] journey. [...] We're creating leaders — people who are going out and making a change to work together for jobs. When we leave college, [businesses] want people who can work with other people. LEAD creates that "working together," figuring out solutions to community problems, taking a stand. I think it helps you create your own voice as well. [18]

One LEAD alumna echoes these feelings, noting that LEAD, and specifically LEAD's emphasis on community-building and *familia*, were vital parts of her college experience. She notes that LEAD makes participants "better students, better people, and better citizens in [their communities."[19]

Many respondents also indicate that LEAD participation provides them with **institutional knowledge and access to opportunities** that they would not have otherwise had. For instance, the LEAD program can serve as a gateway to other leadership roles at the institution, such as student senators.[20] Similarly, LEAD participation affords students with the opportunity to problem-solve with faculty and other college administrators. One alumna LEAD mentor notes that she met De Anza's president through LEAD, and a separate alumna LEAD mentor notes that LEAD participation enabled her to meet with college faculty to address campus issues and discuss possibilities for changing instructional methods.[21]

Finally, many LEAD mentors indicate that the LEAD environment is **especially supportive of adult learners**, who often have a particularly difficult time adjusting to and building a sense of belonging within traditional post-secondary settings. One student states that she spent time "not feeling like… [she] was a part of the regular classroom setting because [she is] an older student and a mother." She saw the traditional students connecting to each other and having "such a fun time," while she was left feeling misunderstood and uncomfortable.[22] However, after joining LEAD, she connected with students in a similar way and found "a space where [she] feel[s] comfortable to talk about [her] experiences in life." Soon, she "blossomed as a student" and found that she wanted to stay on campus longer for study groups with her *familia.*[23] Another adult learner expressed similar experiences, saying that "[LEAD] helped me be accountable to myself and other students who may not see things the same way, especially the younger students."[24] Through participation in LEAD, this individual was able to find a group of peers with whom she could bond, and also guide and mentor younger students with less "life experience." These strong bonds formed by participation in the LEAD program help students — including adult learners — become more connected to their academic and social communities.

[18] Ibid.
[19] Interview with LEAD alumna; May 12, 2015. Op. cit.
[20] Interview with LEAD student; May 12, 2015. Op. cit.
[21] Interview with LEAD alumna, De Anza Community College. Telephone interview, May 4, 2015.
[22] Interview with LEAD student; May 5, 2015. Op. cit.
[23] Ibid.
[24] Interview with LEAD student; May 6, 2015. Op. cit.

SECTION III: EFFECTS OF LEAD PARTICIPATION ON DEGREE COMPLETION, PERSISTENCE, AND TRANSFER

This section discusses student outcomes as measured by attainment of a degree or certificate at De Anza, term-by-term enrollment persistence, and transfer to a four-year institution. All regression models presented in this section include year and term fixed effects. These regressions also control for observed differences in academic and background characteristics. When examining each outcome, we analyze LEAD participants in comparison to their matched non-LEAD peers. Further, as with the previous section, this section contains findings from interviews with LEAD mentors that help contextualize the quantitative analysis.

MAIN TAKEAWAYS

- When compared to their non-LEAD peers, LEAD participants are 9.1 percentage points less likely to complete a degree or certificate at De Anza and 13.6 percentage points less likely to transfer to a four-year institution. However, LEAD participants continuously enroll for 0.47 terms longer than non-LEAD peers.
- Interview respondents indicate LEAD alumni fill key support roles within the program. At least two out of nine interview respondents attributed their success in the transfer process to the support provided by LEAD alumni.

ATTAINING A DEGREE OR CERTIFICATE

Figure 3.1 presents the regression estimates of LEAD participation on student degree or certificate attainment at De Anza. The results show that LEAD participants are 9.1 percentage points less likely to have completed a degree or certificate than their non-LEAD peers.

Among LEAD participants and their matched peers, female students are about 0.7 percentage points more likely than male students to complete a degree at De Anza. Students who attained an associate's degree prior to entering De Anza are 24 percentage points more likely to complete a degree than students who have only received a high school diploma. Additionally, students who are either taking four-year requirements or those who have not reported educational or vocational goals are approximately 15 percentage points less likely to complete a degree compared to students whose goals are to transfer to a four-year institution

Figure 3.1: Regression Estimates of Degree Completion

Predictor	LEAD and Matched non-LEAD students
LEAD participant	-0.091***
Female/Missing[25]	0.069***
Race/Ethnicity[26]	
Native American	-0.094
African American	-0.033
Filipino and Pacific Islander	0.021
Latino/a	0.041*
White	0.019
Declined to state/Unknown	0.009
Age Group[27]	
Younger than 18	0.001
Ages 21 to 25	0.044*
Ages 26 to 30	0.010
Ages 31 to 45	0.078
Older than 45	-0.039
Residency[28]	
AB540 non-resident tuition exempt	0.022
Non-resident international	-0.050*
Non-CA US resident	-0.028
Prior Education[29]	
Prior education: Bachelor's	0.025
Prior education: Associate's	0.239**
Prior education: GED	0.001
Prior education: HS student (prior education unknown)	0.118
Missing prior education information	0.055
Educational Goal[30]	
Has vocational goal	-0.083*
Goal: Associate's no transfer	-0.040
Goal: Vocational degree/certificate	-0.041
Goal: career preparation	0.132
Goal: undecided	-0.037
Goal: 4-year student taking reqs	-0.148***
Goal: other/missing	-0.160***
Constant	0.221***
Includes year-level fixed effects	Yes
Includes term-level fixed effects	Yes
Observations	**15,206**
R-squared	**0.070**

* p<0.10; ** p<0.05; *** p<0.01. Coefficients estimated using Ordinary Least Squares, with robust standard errors clustered at the student level.

[25] Reference group: Male
[26] Reference group: Asian
[27] Reference group: Ages 18 to 20
[28] Reference group: Resident (of CA)
[29] Reference group: HS graduate
[30] Reference group: Transfer to a 4-year institute

TERM-BY-TERM PERSISTENCE

Figure 3.2 presents estimates from the model of LEAD participation on term-by-term persistence. Here, there is a significant effect of being involved in LEAD: when compared to matched non-LEAD peers, continuous enrollment at De Anza is about 0.5 terms longer for LEAD participants.

Figure 3.2: Regression Estimates of Persistence

PREDICTOR	LEAD AND MATCHED NON-LEAD STUDENTS
LEAD participant	0.472***
Female/Missing[31]	-0.449***
RACE/ETHNICITY[32]	
Native American	-1.997*
African American	-0.460
Filipino and Pacific Islander	-0.114
Latino/a	0.076
White	-0.318
Declined to state/Unknown	1.015*
AGE GROUP[33]	
Younger than 18	0.544*
Ages 21 to 25	-0.631***
Ages 26 to 30	-1.013***
Ages 31 to 45	-0.102
Older than 45	1.510
RESIDENCY[34]	
AB540 non-resident tuition exempt	0.242
Non-resident international	-0.271
Non-CA US resident	-0.807
PRIOR EDUCATION[35]	
Prior education: Bachelor's	-0.329
Prior education: Associate's	-0.990**
Prior education: GED	-0.491*
Prior education: HS student (prior education unknown)	-0.521
Missing prior education information	1.197***
EDUCATIONAL GOAL[36]	
Has vocational goal	-1.333***
Goal: Associate's no transfer	-0.157
Goal: Vocational degree/certificate	0.480
Goal: career preparation	0.058
Goal: undecided	0.228
Goal: 4-year student taking reqs	-1.718***

[31] Reference group: Male
[32] Reference group: Asian
[33] Reference group: ages 18 to 20
[34] Reference group: resident (of CA)
[35] Reference group: HS graduate
[36] Reference group: transfer to 4-year institute

PREDICTOR	LEAD AND MATCHED NON-LEAD STUDENTS
Goal: other/missing	0.360
Constant	6.854***
Includes year-level fixed effects	Yes
Includes term-level fixed effects	Yes
Observations	**15,206**
R-squared	**0.078**

* p<0.10; ** p<0.05; *** p<0.01. Coefficients estimated using Ordinary Least Squares, with robust standard errors clustered at the student level.

TRANSFER TO A FOUR-YEAR INSTITUTION

Finally, Figure 3.3 presents estimates of the effect of LEAD participation on whether a student transfers to a four-year institution. The results show that LEAD participants are about 13.6 percentage points less likely to transfer to a four-year institution than matched non-LEAD peers.

Figure 3.3: Regression Estimates of Transfer to a Four-Year Institution

PREDICTOR	LEAD AND MATCHED NON-LEAD STUDENTS
LEAD participant	-0.136***
Female/Missing[37]	0.042**
RACE/ETHNICITY[38]	
Native American	-0.082
African American	-0.162***
Filipino and Pacific Islander	-0.109***
Latino/a	-0.178***
White	-0.066**
Declined to state/Unknown	-0.194***
AGE GROUP[39]	
Younger than 18	0.017
Ages 21 to 25	-0.069***
Ages 26 to 30	-0.134***
Ages 31 to 45	-0.146***
Older than 45	-0.259***
RESIDENCY[40]	
AB540 non-resident tuition exempt	-0.083**
Non-resident international	-0.283***
Non-CA US resident	0.143
PRIOR EDUCATION[41]	
Prior education: Bachelor's	0.119*
Prior education: Associate's	0.248***
Prior education: GED	-0.021
Prior education: HS student (prior education unknown)	-0.089
Missing prior education information	-0.074**
EDUCATIONAL GOAL[42]	
Has vocational goal	-0.354***
Goal: Associate's no transfer	-0.127***
Goal: Vocational degree/certificate	-0.165***
Goal: career preparation	0.233**
Goal: undecided	-0.071*
Goal: 4-year student taking reqs	0.197***
Goal: other/missing	-0.070
Constant	0.621***
Includes year-level fixed effects	Yes
Includes term-level fixed effects	Yes
Observations	**15,206**
R-squared	**0.154**

* p<0.10; ** p<0.05; *** p<0.01. Coefficients estimated using Ordinary Least Squares, with robust standard errors clustered at the student level.

[37] Reference group: Male
[38] Reference group: Asian
[39] Reference group: ages 18 to 20
[40] Reference group: resident (of CA)
[41] Reference group: HS graduate
[42] Reference group: transfer to 4-year institute

Several interview participants elaborated on the role that LEAD plays during the transfer process by citing the specific support they received from LEAD alumni, through both formal and informal channels. Students express gratitude toward alumni for visiting, contributing to campus projects, and presenting to LEAD students about their careers since leaving De Anza College. Three participants also note that alumni often return to campus informally, which both reinforces the strength of the community built by LEAD, as well as presents opportunities for current LEAD participants to interact with successful college graduates. As one participant notes, "alumni are always coming back on campus because you know how much it meant to them. It's a very strong support system."[43]

Further, guidance from alumni helps current LEAD students navigate an often-complicated transfer process. In particular, four respondents noted the important role that alumni play as a link between De Anza and four-year institutions. Two current students credit alumni with helping them through the transfer and job search process.[44, 45] Similarly, one alumna notes that "One [alumnus] recommended the UC Berkeley mentorship program and that was very helpful." By connecting with that program, she was put in contact with a student at Berkeley pursuing her major of interest and was given a sense of what to expect after De Anza: "That's something alumni bring into LEAD: they're going through things currently and can provide a viewpoint others can't."[46]

Finally, in a powerful anecdote, one alumna explained the profound effect that LEAD had on her persistence and transfer outcomes. This alumna attended more than three community colleges over 10 years before finally finding De Anza and the LEAD program. The previous community colleges she attended lacked a sense of community; she found them to be "very individualistic" and impersonal.[47] However, when she came to De Anza and enrolled in a LEAD class, she "found a niche and a way to actually get through [her] college experience."[48] What set her experience at De Anza apart from the other schools she attended was the strong sense of community within the LEAD program: "It wasn't until I was taking LEAD classes that I knew other people and built community ties." This alumna successfully transferred within two years of joining LEAD, and credits LEAD participation for her eventual college success.[49] This particular example indicates that, although data suggest that transfer rates are lower among LEAD students, the program may be the defining difference for students who persisted poorly at previous community colleges.

[43] Interview with LEAD student; May 11, 2015. Op. cit.
[44] Interview with LEAD alumna; May 4, 2015. Op. cit.
[45] Interview with LEAD student; May 11, 2015. Op. cit.
[46] Interview with LEAD alumna; May 11, 2015. Op. cit.
[47] Interview with LEAD alumna; May 4, 2015. Op. cit.
[48] Ibid.
[49] Ibid.

ADDITIONAL PARTICIPANT INSIGHT

As noted in the previous section, feedback from LEAD mentors indicates that LEAD's value extends beyond purely academic outcomes. The LEAD program creates a valuable support network for participants, and can often facilitate access to transfer opportunities or job placement that would not have been otherwise possible.

However, several students indicate that the program currently suffers from a lack of funding, which limits the reach and impact that it can have. For instance, one student notes that additional funding could help the program provide vans that would facilitate off-campus field trips to experiences such as community service and civic engagement. She goes on to explain that immigrants and undocumented students do not typically have access to transportation, which makes participation in such opportunities difficult without affordable transportation.[50] Two additional LEAD participants further note that with more funding, LEAD could hire (and pay) more mentors, which would help the program expand its reach and impact.[51, 52] According to one of these students:

> There aren't a lot of funds, it's a job that takes up a lot of time. Students do it gladly, but I think it would be beneficial if they were paid for their services. Especially if they can't because they work. To give this opportunity to other students would be great, especially since there are a lot of job skills to gain from that.

However, despite the concerns about funding, nearly every interviewee notes that they appreciate the degree to which faculty and administrators support their program. Respondents are overwhelmingly satisfied with their experiences in the LEAD program, and are grateful that they were given the opportunity to participate in LEAD's supportive community.

[50] Interview with LEAD alumna; May 12, 2015. Op. cit.
[51] Interview with LEAD student; May 5, 2015. Op. cit.
[52] Interview with LEAD alumna; May 11, 2015. Op. cit.

APPENDIX: FULL REGRESSION ESTIMATES

SUCCESS WHEN TAKING LEAD COURSES

Figure A.1: Regression Estimates of Current Term Success on LEAD Participation

Predictor	Term GPA in Non-LEAD Courses	Overall Term GPA	Term GPA in STEM Courses	Term Pass Rate
Enrolled in one LEAD course	0.091**	0.160***	0.029	0.029**
	-0.041	-0.038	-0.078	-0.012
Enrolled in two LEAD courses	0.268	0.670***	-0.297	0.105
	-0.323	-0.177	-1.204	-0.068
Number of non-LEAD courses in term	0.110***	0.110***	0.045*	0.024***
	-0.012	-0.012	-0.027	-0.004
Took a STEM course	-0.240***	-0.237***	-	-0.060***
	-0.024	-0.024		-0.007
Number of STEM courses in term	-	-	0.086**	-
			-0.036	
Took a Basic Skills course	0.148***	0.146***	0.197***	0.046***
	-0.031	-0.03	-0.056	-0.009
Fixed Effects[53]				
Year = 2012	0.078**	0.081**	0.062	0.004
	-0.037	-0.037	-0.079	-0.012
Year = 2013	0.080*	0.083*	0.051	-0.011
	-0.046	-0.046	-0.09	-0.014
Year = 2014	0.134**	0.133**	0.026	-0.012
	-0.053	-0.053	-0.103	-0.016
Year = 2015	0.155**	0.149**	-0.039	-0.040*
	-0.066	-0.065	-0.132	-0.02
Term = 2	-0.297***	-0.303***	-0.316***	-0.081***
	-0.036	-0.036	-0.079	-0.011
Term = 3	-0.280***	-0.277***	-0.328***	-0.082***
	-0.038	-0.038	-0.08	-0.012
Term = 4	-0.335***	-0.332***	-0.422***	-0.112***
	-0.039	-0.039	-0.083	-0.012
Constant	2.640***	2.640***	2.405***	0.765***
	-0.051	-0.051	-0.105	-0.014
Includes student-level fixed effects	Yes	Yes	Yes	Yes
Observations	**13,526**	**13,604**	**7,129**	**15,206**
R-squared	**0.581**	**0.586**	**0.615**	**0.491**

* p<0.10; ** p<0.05; *** p<0.01. Coefficients estimated using Ordinary Least Squares, with robust standard errors clustered at the student level.

[53] Reference groups: 2011 (Year), Summer (1, Term)

SUCCESS AFTER TAKING LEAD COURSES

Figure A.2: Regression Estimates of Current Term Success on LEAD Participation Last Term

Predictor	Overall Term GPA	Term GPA in STEM Courses	Term Pass Rate
Enrolled in one LEAD course in previous term	-0.021	-0.059	0.001
	-0.047	-0.097	-0.016
Enrolled in two LEAD courses in previous term	-0.628	-0.272	-0.063
	-0.453	-0.627	-0.117
Number of non-LEAD courses in term	0.093***	0.023	0.024***
	-0.014	-0.031	-0.004
Took a STEM course	-0.231***	-	-0.051***
	-0.029		-0.009
Number of STEM courses in term	-	0.080*	-
		-0.043	
Took a Basic Skills course	0.096***	0.098	0.046***
	-0.036	-0.068	-0.011
Fixed Effects[54]			
Year = 2012	0.105**	0.079	0.027*
	-0.045	-0.095	-0.014
Year = 2013	0.109*	0.035	0.015
	-0.058	-0.114	-0.018
Year = 2014	0.155**	-0.005	0.023
	-0.069	-0.13	-0.022
Year = 2015	0.195**	-0.016	0.034
	-0.092	-0.181	-0.03
Term = 2	-0.188***	-0.258***	-0.011
	-0.044	-0.1	-0.014
Term = 3	-0.185***	-0.283***	-0.018
	-0.046	-0.102	-0.015
Term = 4	-0.248***	-0.385***	-0.051***
	-0.045	-0.102	-0.015
Constant	2.646***	2.511***	0.689***
	-0.067	-0.133	-0.022
Includes student-level fixed effects	Yes	Yes	Yes
Observations	**9,818**	**5,395**	**10,527**
R-squared	**0.622**	**0.655**	**0.536**

* p<0.10; ** p<0.05; *** p<0.01. Coefficients estimated using Ordinary Least Squares, with robust standard errors clustered at the student level.

[54] Reference groups: 2011 (Year), Summer (1, Term)

Figure A.3: Regression Estimates of Current Term Success on LEAD Participation Two Terms Ago

Predictor	Overall Term GPA	Term GPA in STEM Courses	Term Pass Rate
Enrolled in one LEAD courses two terms ago	-0.069	-0.134	-0.025
	-0.054	-0.097	-0.017
Enrolled in two LEAD courses two terms ago	0.356	1.101	0.051
	-0.364	-0.699	-0.112
Number of non-LEAD courses in term	0.096***	0.031	0.028***
	-0.016	-0.034	-0.005
Took a STEM course	-0.236***	-	-0.059***
	-0.033		-0.01
Number of STEM courses in term	-	0.078	-
		-0.05	
Took a Basic Skills course	0.122***	0.185**	0.040***
	-0.043	-0.077	-0.012
Fixed Effects[55]			
Year = 2012	0.140**	0.036	0.031*
	-0.055	-0.118	-0.017
Year = 2013	0.139**	0.011	0.025
	-0.069	-0.144	-0.022
Year = 2014	0.189**	0.011	0.035
	-0.081	-0.162	-0.026
Year = 2015	0.271***	0.035	0.049
	-0.1	-0.205	-0.033
Term = 2	-0.233***	-0.322***	-0.040***
	-0.046	-0.107	-0.015
Term = 3	-0.155***	-0.292***	-0.018
	-0.05	-0.11	-0.017
Term = 4	-0.218***	-0.394***	-0.045***
	-0.048	-0.11	-0.016
Constant	2.577***	2.483***	0.673***
	-0.08	-0.162	-0.026
Includes student-level fixed effects	Yes	Yes	Yes
Observations	**8,321**	**4,462**	**8,946**
R-squared	**0.636**	**0.671**	**0.555**

* p<0.10; ** p<0.05; *** p<0.01. Coefficients estimated using Ordinary Least Squares, with robust standard errors clustered at the student level.

[55] Reference groups: 2011 (Year), Summer (1, Term)

ATTAINING A DEGREE OR CERTIFICATE

Figure A.4: Regression Estimates of Degree Completion

PREDICTOR	LEAD AND MATCHED NON-LEAD STUDENTS
LEAD participant	-0.091***
	(0.019)
Female/Missing[56]	0.069***
	(0.017)
RACE/ETHNICITY[57]	
Native American	-0.094
	(0.062)
African American	-0.033
	(0.031)
Filipino and Pacific Islander	0.021
	(0.033)
Latino/a	0.041*
	(0.022)
White	0.019
	(0.027)
Declined to state/Unknown	0.009
	(0.066)
AGE GROUP[58]	
Younger than 18	0.001
	(0.032)
Ages 21 to 25	0.044*
	(0.026)
Ages 26 to 30	0.010
	(0.041)
Ages 31 to 45	0.078
	(0.058)
Older than 45	-0.039
	(0.059)
RESIDENCY[59]	
AB540 non-resident tuition exempt	0.022
	(0.040)
Non-resident international	-0.050*
	(0.027)
Non-CA US resident	-0.028
	(0.090)
PRIOR EDUCATION[60]	
Prior education: Bachelor's	0.025
	(0.058)
Prior education: Associate's	0.239**

[56] Reference group: Male
[57] Reference group: Asian
[58] Reference group: Ages 18 to 20
[59] Reference group: Resident (of CA)
[60] Reference group: HS graduate

Predictor	LEAD and Matched non-LEAD Students
	(0.097)
Prior education: GED	0.001
	(0.034)
Prior education: HS student (prior education unknown)	0.118
	(0.129)
Missing prior education information	0.055
	(0.034)
Educational Goal[61]	
Has vocational goal	-0.083*
	(0.050)
Goal: Associate's no transfer	-0.040
	(0.032)
Goal: Vocational degree/certificate	-0.041
	(0.090)
Goal: career preparation	0.132
	(0.088)
Goal: undecided	-0.037
	(0.035)
Goal: 4-year student taking reqs	-0.148***
	(0.021)
Goal: other/missing	-0.160***
	(0.043)
Fixed Effects[62]	
Year = 2012	0.011
	(0.010)
Year = 2013	-0.033***
	(0.012)
Year = 2014	-0.091***
	(0.014)
Year = 2015	-0.139***
	(0.016)
Term = 2	-0.018**
	(0.007)
Term = 3	-0.019**
	(0.008)
Term = 4	-0.017**
	(0.008)
Constant	0.221***
	(0.022)
Observations	**15,206**
R-squared	**0.070**

* p<0.10; ** p<0.05; *** p<0.01. Coefficients estimated using Ordinary Least Squares, with robust standard errors clustered at the student level.

[61] Reference group: Transfer to a 4-year institution
[62] Reference group: 2011 (Year), Summer (1, Term)

TERM-BY-TERM PERSISTENCE

Figure A.5: Regression Estimates of Persistence

Predictor	LEAD and Matched non-LEAD students
LEAD participant	0.472***
	(0.168)
Female/Missing[63]	-0.449***
	(0.150)
Race/Ethnicity[64]	
Native American	-1.997*
	(1.157)
African American	-0.460
	(0.332)
Filipino and Pacific Islander	-0.114
	(0.290)
Latino/a	0.076
	(0.204)
White	-0.318
	(0.225)
Declined to state/Unknown	1.015*
	(0.530)
Age Group[65]	
Younger than 18	0.544*
	(0.279)
Ages 21 to 25	-0.631***
	(0.238)
Ages 26 to 30	-1.013***
	(0.311)
Ages 31 to 45	-0.102
	(0.614)
Older than 45	1.510
	(1.326)
Residency[66]	
AB540 non-resident tuition exempt	0.242
	(0.347)
Non-resident international	-0.271
	(0.232)
Non-CA US resident	-0.807
	(0.580)
Prior Education[67]	
Prior education: Bachelor's	-0.329
	(0.722)
Prior education: Associate's	-0.990**

[63] Reference group: Male
[64] Reference group: Asian
[65] Reference group: Ages 18 to 20
[66] Reference group: Resident (of CA)
[67] Reference group: HS graduate

Predictor	LEAD and Matched non-LEAD students
	(0.486)
Prior education: GED	-0.491*
	(0.266)
Prior education: HS student (prior education unknown)	-0.521
	(0.813)
Missing prior education information	1.197***
	(0.289)
Educational Goal[68]	
Has vocational goal	-1.333***
	(0.451)
Goal: Associate's no transfer	-0.157
	(0.316)
Goal: Vocational degree/certificate	0.480
	(0.702)
Goal: career preparation	0.058
	(0.661)
Goal: undecided	0.228
	(0.343)
Goal: 4-year student taking reqs	-1.718***
	(0.366)
Goal: other/missing	0.360
	(0.663)
Fixed Effects[69]	
Year = 2012	1.060***
	(0.088)
Year = 2013	0.977***
	(0.107)
Year = 2014	0.004
	(0.126)
Year = 2015	-1.154***
	(0.162)
Term = 2	-0.222***
	(0.071)
Term = 3	-0.111
	(0.075)
Term = 4	-0.152**
	(0.075)
Constant	6.854***
	(0.183)
Observations	**15,206**
R-squared	**0.078**

*p<0.10; **p<0.05; ***p<0.01. Coefficients estimated using OLS with robust standard errors clustered at the student level.

[68] Reference group: Transfer to a 4-year institution
[69] Reference group: 2011 (Year), Summer(1, Term)

TRANSFER TO A FOUR-YEAR INSTITUTION

Figure A.6: Regression Estimates of Transfer to a Four-Year Institution

PREDICTOR	LEAD AND MATCHED NON-LEAD STUDENTS
LEAD participant	-0.136***
	(0.020)
Female/Missing[70]	0.042**
	(0.018)
RACE/ETHNICITY[71]	
Native American	-0.082
	(0.153)
African American	-0.162***
	(0.038)
Filipino and Pacific Islander	-0.109***
	(0.038)
Latino/a	-0.178***
	(0.025)
White	-0.066**
	(0.031)
Declined to state/Unknown	-0.194***
	(0.033)
AGE GROUP[72]	
Younger than 18	0.017
	(0.036)
Ages 21 to 25	-0.069***
	(0.024)
Ages 26 to 30	-0.134***
	(0.038)
Ages 31 to 45	-0.146***
	(0.039)
Older than 45	-0.259***
	(0.047)
RESIDENCY[73]	
AB540 non-resident tuition exempt	-0.083**
	(0.037)
Non-resident international	-0.283***
	(0.028)
Non-CA US resident	0.143
	(0.112)
PRIOR EDUCATION[74]	
Prior education: Bachelor's	0.119*
	(0.069)
Prior education: Associate's	0.248***

[70] Reference group: Male
[71] Reference group: Asian
[72] Reference group: Ages 18 to 20
[73] Reference group: Resident (of CA)
[74] Reference group: HS graduate

Predictor	LEAD and Matched non-LEAD students
	(0.088)
Prior education: GED	-0.021
	(0.036)
Prior education: HS student (prior education unknown)	-0.089
	(0.079)
Missing prior education information	-0.074**
	(0.031)
Educational Goal[75]	
Has vocational goal	-0.354***
	(0.064)
Goal: Associate's no transfer	-0.127***
	(0.031)
Goal: Vocational degree/certificate	-0.165***
	(0.035)
Goal: career preparation	0.233**
	(0.093)
Goal: undecided	-0.071*
	(0.039)
Goal: 4-year student taking reqs	0.197***
	(0.053)
Goal: other/missing	-0.070
	(0.054)
Fixed Effects[76]	
Year = 2012	-0.008
	(0.011)
Year = 2013	-0.072***
	(0.013)
Year = 2014	-0.155***
	(0.016)
Year = 2015	-0.235***
	(0.018)
Term = 2	-0.065***
	(0.008)
Term = 3	-0.064***
	(0.009)
Term = 4	-0.054***
	(0.009)
Constant	0.621***
	(0.025)
Observations	**15,206**
R-squared	**0.154**

* p<0.10; ** p<0.05; *** p<0.01. Coefficients estimated using Ordinary Least Squares, with robust standard errors clustered at the student level.

[75] Reference group: Transfer to a 4-year institution
[76] Reference group: 2011 (Year), Summer(1, Term)

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