

RETURN ON INVESTMENT CONVENING

The Return on Investment for an AANAPISI-Funded Program: Outcomes for Asian American and Pacific Islander Community College Students

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Executive Summary

Over half of all students who enroll in community college are in of need remediation (Bailey, Jeong, & Cho, 2010) and of those students who register for at least one remedial course at a community college, the likelihood of transferring to a four-year institution or earning a college degree decreases (Bailey, 2009). Accordingly, this study examines the impact of a federally funded developmental learning community (LC) on the educational outcomes of low-income Asian American and Pacific Islander (AAPI) students enrolled in remedial education at one community college.

The AANAPISI intervention at De Anza College, Initiatives to Maximize Positive Academic Achievement and Cultural Thriving among AAPI (IMPACT AAPI), was born into an institution with a long history of LCs that provide targeted support to a vastly diverse campus population. Building upon the success of past LC programs, IMPACT AAPI developed *Readiness and Success in College-Level English (LinC)* to target low-income AAPI students in developmental English reading and writing courses, with a particular focus on Southeast Asians and Pacific Islanders – subgroups within the AAPI community who have historically faced huge barriers to academic achievement. By linking the remedial English course (two levels below college level) with a college-credit bearing Asian American literature course, De Anza offered culturally-relevant, critical and engaged pedagogies; culturally-relevant, critical, and civic curriculum; as well as, comprehensive wrap-around services, including an embedded counselor.

Utilizing institutional data and an in-depth assessment of *LinC*, a *value-added* framework guided our use of propensity score matching techniques to attempt to isolate the added value of participating in this LC. By matching students in the LC with students also in developmental education but not in an LC, the study highlights a positive return on investment on this federally funded program for De Anza. To assess the value-added of *LinC*, the following outcomes were evaluated:

- Short-term outcomes: transition from developmental to college level courses and credit accumulation (as defined by credits earned/credits attempted).
- Long-term outcomes: persistence from one academic term to the next, degree attainment and transfer to a four-year institution.

Through this extensive analysis, several key findings emerge:

- AAPI students in the federally funded LC were more likely to transition from developmental to college-level English than their peers who did not participate in the LC.
- AAPI students in the LC transitioned from developmental to college-level English in less time than non-LC students and were also more likely to pass their subsequent college-level English course.
- Students in *LinC*, as compared to those not in the LC, are more likely to earn associate's degrees.
- Targeted subgroups (i.e., Southeast Asians and Pacific Islanders) also improved their outcomes through participation in LCs, compared to those who did not participate in LCs.

These findings have a number of important implications for research, policy and practice:

Research

- While federal funding has supported the foundational and impactful work of AANAPISIs, and other minority serving institutions (MSIs), the extant literature on MSIs has focused primarily on the outcomes of such programs, services and practices. Accordingly, there remains a need for rigorous research that extrapolates specifically on the link between funding and outcomes for the underrepresented students served at MSIs.
- Although there is a growing body of literature on the success of MSIs in improving the academic experiences and outcomes of underrepresented students, there is a need to contribute explicit research on how MSIs, cumulatively, move the academic success needle, particularly within the context of national higher education priorities, like the college completion agenda.

Policy

- Federal funding allows institutions to develop programs that directly support the success of underrepresented students and increase institutional capacity to improve academic success (e.g. degree attainment). Accordingly, financial support for institutions serving the nation's most underserved populations is critical.
- Studies like this one provide an excellent policy opportunity to disseminate and scale up best practices in order to broaden the education sector's reach in improving educational outcomes.
- Given the limited capacity AANAPISIs, and all other MSIs, often face, there is a need to support the development of assessment practices that helps to sustain successful institutional initiatives and drives innovative research that makes the case for MSIs.
- Government and foundations play a critical role as partners who can provide opportunities to further MSI programs and services empirically demonstrated to improve academic success.

Practice

- Interventions should target a particular academic barrier identified on campus (e.g., transition from developmental to college level coursework). More narrow goals help to define program goals, activities and thus, measures of success. This also provides a strong foundation for institutional buy-in, a key component of successful interventions.
- Institutional research that can contribute to the intervention's assessment process is critical to the immediate and long-term success of the intervention, as it defines the measure for program success and helps to sustain future efforts.
- Evidence of success should drive efforts to replicate and scale up programs. These findings should also be shared with a broader audience outside the institution. The engagement of campus constituents in regards to the intervention broadly, and the assessments specifically, are a necessary component to situate the efforts within institutional priorities and to generate buy-in for the program's continued existence and success.

The Return on Investment for an AANAPISI-Funded Program: Outcomes for Asian American and Pacific Islander Community College Students

Despite common misconceptions about Asian American and Pacific Islander (AAPI) students experiencing unparalleled academic success and primarily enrolling in highly selective colleges, nearly half of all AAPI college students are enrolled in community colleges and one in five requires remedial education (National Commission on AAPI Research in Education [CARE], 2010, 2013). When examining the differences across AAPI ethnic subgroups, the myth of their universal success is further diminished. Take, for example, the national Bachelor's degree attainment rates of Southeast Asians – a regional group that has historically faced greater barriers to academic success – including Vietnamese (25.8%), Cambodian (14.1%), Hmong (14.7%) and Laotian (12.4%) (CARE, 2013). Held up against the degree attainment of Taiwanese (74.1%), Asian Indians (71.1%) and Chinese (51.5%) (CARE, 2013) achieving the same level of education, the huge disparities within the AAPI population and the inaccurate portrayal of AAPIs as model minorities becomes more apparent.

The vast differences in the population are even more dramatic when considering the differences between AAPIs attending two-year colleges, as opposed to those in university settings. AAPI students at community colleges, for example, are more likely to face a number of academic “risk factors” that serve as barriers to persistence and college completion, including delayed matriculation, enrolling part-time, having family responsibilities, low socioeconomic status, and working while enrolled in college (National Commission on AAPI Research in Education [CARE], 2011; Yeh, 2002). With this in mind, targeted interventions focusing specifically on particular subgroups and their specific academic needs and challenges have been found to improve the educational experiences and outcomes of AAPI students. In a study at Coastline Community College, for example, Nguyen, Nguyen, and Nguyen (2014) highlighted institutional efforts that respond to the unique needs of a high concentration of first generation Vietnamese students and the extent to which their targeted efforts have helped the institution exceed their goals to increase transfer to and enrollment in degree-applicable courses from developmental education (Nguyen, Nguyen, & Nguyen, 2014). While scholarship focusing on specific AAPI subgroups is limited, examples like this one are foundational for highlighting the need for higher education to focus on the unique academic needs of AAPI students.

The opportunity for institutions that serve high concentrations of low-income AAPI students to pursue targeted interventions to address the unique needs and challenges of their students has become increasingly possible given the creation of the Asian American and Native American Pacific Islander Serving Institution (AANAPISI) program. The federal AANAPISI designation and funding emerged in 2008 and is one of the most recent additions to minority-serving institutions (MSIs). In order to receive the AANAPISI designation and grant funding, institutions must enroll at least 10 percent full-time AAPI students, of which 50 percent must be low-income (as determined by Pell grant eligibility).

AANAPISIs reflect the growing AAPI population, especially in concentrated areas throughout the United States. At its inception there were 116 institutions eligible for AANAPISI designation, 12 designated institutions, and 6 funded AANAPISIs (Teranishi, Martin, Bordoloi Pazich, Alcantar, & Nguyen, 2014). By 2012, the number of AANAPISIs increased significantly to 153 eligible, 78 designated, and 21 funded AANAPISIs (Teranishi et al., 2014). Over half of all AANAPISIs are located in the Western and Pacific regions of the United States (CARE, 2013).

AANAPISIs have been critical for recognizing the needs of and serving large proportions

of underserved and underrepresented low-income AAPI college students (Teranishi et al., 2014). Because of the high concentration of AAPI students in community colleges, nearly half of all AANAPISIs are community colleges (52.4%), making them critical sites for improving national college completion rates for this population (CARE, 2013). This is clearly illustrated when we examine national degree earning trends by AANAPISIs; in 2010, nearly half of all associate degrees granted to AAPIs nationally were from AANAPISIs (CARE, 2013).

To address the needs of AAPI students in community college, many AANAPISIs invest their MSI funding on academic and student support services to improve the transition from remedial education to college level courses, retention, transfer and degree earning rates of these students. Some AANAPISIs develop student support centers equipped with computer labs, others provide tutoring, or offer a designated academic counselor for AAPI students, or professional development for faculty and staff. Most community colleges use their AANAPISI funds to provide developmental education support services, often through learning communities. However, like other MSIs, very little is known empirically about the impact of these federally funded academic and student support services at AANAPISIs. Moreover, few studies have examined the educational outcomes of AAPI students at community colleges specifically (Park & Teranishi, 2008). Accordingly, in this study, we examine the impact of an MSI-funded developmental education learning community (LC) on the educational outcomes of AAPI students at one community college. The following research questions guide our study:

1. Did the AANAPISI-funded learning community lead to improved short-term outcomes (i.e., transition from developmental to college level English courses, time to transition to college-level English, course passing rates) for AAPI students in developmental education compared to AAPI student who did not participate in an LC?
2. Did the AANAPISI-funded learning community lead to improved long-term outcomes (i.e., persistence, transfer and degree attainment, time to transfer and degree attainment) for AAPI students in developmental education compared to AAPI student who did not participate in an LC?
3. Were there any differences in outcomes for targeted AAPI ethnic groups (i.e., Southeast Asian and Pacific Islanders) in the AANAPISI-funded developmental English LC compared to those not in an LC?

Developmental Education & Learning Communities

Nationally, over half of all students in community colleges have taken at least one remedial course- variously called developmental education or basic skills coursework (Bailey, Jenkins, & Leinbach, 2005; Bailey, Jeong, & Cho, 2010). To make matters worse, a large proportion of students entering college in need of developmental education are racial/ethnic minority students (52%) (Fernandez, Barone, & Klepfer, 2014) thus further widening the opportunity gap between racial/ethnic minorities and Whites.

Developmental education refers to courses aimed at developing the literacy, writing, and/or mathematics skills of adult learners whose assessment scores, at the start of college, placed them below college-level mathematics and English courses. Unfortunately, less than 50 percent of students placed into developmental education will finish their required developmental education coursework and only 25 percent will earn a certificate or degree within eight years (Bailey, 2009). For most students, degree completion in five years is difficult

due in large part to the remedial coursework needed prior to enrolling in college-level courses (Shapiro et al., 2012). In noting students' progression through developmental sequences, researchers regard placement errors, instructional practice, and the power of external pulls (e.g. working more than part-time, attending school part-time) as obstacles (Belfield & Crosta, 2012; Grubb, 2013; Hodara, Jaggars, & Karp, 2012).

To address this, developmental education learning communities (LCs) emerged in community colleges across the nation over the last four decades (Matthews, 1986; Smith, MacGregor, Matthews, & Gabelnick, 2004), especially at institutions more likely to serve greater proportions of underrepresented racial/ethnic minority students such as minority serving institutions (MSIs). Given that a majority of students enrolled in community colleges are not academically prepared for college-level coursework (Parsad, Lewis, & Greene, 2003), LCs serve as a means to improve the academic success of students. LC models include: a) single classroom-based models (Bielaczyc & Collins, 1999); b) cohort-based models (Kuh, 2008); c) virtual learning communities (Chen, Chen, & Kinshuk, 2009); and d) living-learning communities (Brower & Inkelas, 2010). The structure of LCs varies, but their unifying characteristic can be seen within the cohort model where two or more individually taught classes are linked together (through assignments, topics, etc.). More comprehensive LC programs may further integrate curriculum, promote cooperation among instructors, and even foster collaboration with student services such as counseling programs (Gabelnick, MacGregor, Matthews, & Smith, 1990).

In addition to structural differences, the curriculum within LC classrooms also varies. For example, institutions may pair a remedial course with a personal development course focused on developing students' college success skills (e.g., time management, communicating with faculty or career search and preparation), a supplemental instruction (SI) course (supplements the remedial course with tutoring or study skills), or a college-level course. Many LCs will also incorporate an embedded counselor (Levin & Calcagno, 2008). In 2002, the National Survey of First-Year Academic Practices found that 62 percent of colleges practice some form of the outlined LCs (Barefoot, 2002).

Based on the idea that more academic and social involvement translates into a greater likelihood of academic success, LCs are associated with higher retention rates (Lindblad, 2000; Shapiro & Levine, 1999), higher grade point averages (Baker & Pomerantz, 2000), and increased cognitive skills, especially in reading and writing (Zhao & Kuh, 2004). LCs are seen as a helpful strategy to foster promising results among the large numbers of commuter and part-time students. For example, Tinto's (1998) mixed method study at La Guardia Community College found that remedial students in an LC were more likely to pass their courses than non-participants. This finding is confirmed by Kingsborough's Opening Doors Learning Communities program, which grouped freshmen into three classes: remedial English, a college-level course, and a one-credit orientation course (Bloom & Sommo, 2005). Compared to nonparticipants, students who participated in the LCs at Kingsborough were more likely to pass the English skills assessment test and were more likely to complete the remedial English requirement (Bloom & Sommo, 2005). According to Hill and Woodward's (2013) study at an urban campus, students who were more invested in their learning environment are more likely to increase retention, obtain a greater number of credit hours taken, and progress toward degree completion.

However, studies have found mixed results regarding the impact of developmental education LCs on academic achievement beyond the intervention term and/or after the

subsequent term (Scrivener et al., 2008). For example researchers at MDRC found students in developmental LCs improved their academic achievement and passed developmental education LC courses at greater rates than comparable students, but the impact of the LC seemed to plateau two terms after the intervention (Scrivener et. al, 2008). This reinforces the question regarding the cost and benefits or the added value of LCs as an approach to developmental education. Additionally, limited research has focused on the impact of learning communities for specific racial/ethnic groups.

Conceptual Framework

This study is guided by an analytic framework used to examine the added value of MSI-funded programs on college campuses (Rubin, Stuart, & Zanutto, 2004). The *value-added framework* is used to assess the cost-benefit analysis of policies and programs. Based on analysis of budget allocations, the learning community (the treatment) we are examining was funded exclusively by the institution's AANAPISI grant. In other words, the grant made these targeted efforts possible, which afforded us an opportunity to examine, to the extent possible, the isolated value-added of an AANAPISI-funded LC relative to student's educational outcomes at De Anza College (Rubin et al., 2004). In order to analyze the value-added of the LC, we considered the unit (students), the treatment (developmental LCs), and the potential outcomes (short- and long-term educational outcomes) (Rubin et al., 2004). The short-term outcomes examined included: transition from developmental to college level courses, and credit accumulation. The long-term outcomes included: persistence from one academic term to the next, degree attainment, and transfer rates.

We examined both short- and long-term outcomes as these are performance measures most relevant to community colleges leaders and higher education policymakers. Additionally, our research design and the large AAPI student enrollment at the campus site allowed us to compare AAPI students in AANAPISI-funded LCs (participants) to comparable AAPI students in developmental education who did not participate in the LC (Rubin et al., 2004). This isolates the value-added of the AANAPISI-grant funded LC in terms of short- and long-term education outcomes of low-income AAPI students in developmental education at De Anza College.

Research Setting and Program Description

De Anza College is a large community college located in the suburban community of Cupertino, CA. De Anza's campus looks no different than a university campus with its tall trees, old Spanish-style buildings, large open spaces, and a student center (Mery & Schiorring, 2008). Nearly half of all students (over 47.9%) attending De Anza College commute from the neighboring working class communities, with smaller concentrations of students from the affluent part of the city (8.4% from Cupertino, CA). De Anza has a racially diverse student population with the largest group being Asian American and Pacific Islander (AAPI) students at 39.3 percent (25.1% White; 19.7% Latina/o, 3.6% Black) (Teranishi et al., 2014). Additionally De Anza College has one of the highest graduation and transfer rates in the state of California, but this is only the reality for particular populations. Filipino, Southeast Asian (e.g., Cambodian, Hmong, Laotian, Thai, Vietnamese), and Pacific Islander (including Hawaiian) students, in particular, are less likely to transfer and more likely to be placed in developmental education.

Like many other community colleges, the transition from developmental education to

college-level courses is a significant challenge for De Anza College. In fall 2009, 86 percent of new students who took the English and mathematics placement exams did not qualify for college-level courses (De Anza College, 2012). In order to address the need to support AAPI students in general and Filipino, Southeast Asian, and Pacific Islander students specifically, in their transition to college-level coursework and to increase their persistence and transfer rates, De Anza College pursued the AANAPISI designation and grant. In 2008 De Anza College was part of the first cohort of institutions to receive AANAPISI designation and grant funding to improve the developmental education transition rates and transfer rates for AAPI students.

Already existent on De Anza's campus was their success in high impact practices through developmental education LCs. Many of the developmental LCs focus on guiding students from developmental English or mathematics to college-level courses. Using the AANAPISI grant to address this need and leveraging their campus' strength in LCs, De Anza College developed an AAPI-specific culturally responsive LC focused on developmental English. This LC paired a developmental English reading and writing course that is two levels below college-level English with a college credit-bearing Asian American literature course.

The most unique feature of the AANAPISI-funded developmental LC, and different than other LCs on campus, is its specific focus on incorporating culturally relevant pedagogies and curriculum focused on AAPIs, which has been found to be an effective teaching practice, especially in multicultural learning environments (Freire, 1993; Ladson-Billings, 1995; Morrison, Robbins, & Rose, 2008). Culturally relevant pedagogies are teaching practices that focus on collective empowerment and the utilization of students' own cultures as a vehicle for learning. The four aspects of culturally relevant teaching are: a) caring for "the personal well-being and academic success of students" and acting accordingly; b) effective communication with students and in teaching; c) incorporating culturally diverse curriculum, and d) instruction that engages different forms of learning and participation (Gay, 2010, p. 48; Morrison et al., 2008). Culturally responsive teaching has been found to develop a broader sociopolitical consciousness that allows students to critique cultural norms, values, and institutions that produce and maintain social inequities (Garcia & Okhidoi, 2015; Ladson-Billings, 1995). Aside from developing student's critical consciousness, some experts also report culturally relevant teaching promotes student's motivation to learn (Ginsberg & Wlodkowski, 2009), their sense of belonging and academic self-confidence (Dibben, 2004; Hurtado & Ponjuan, 2005), a more positive view of self and group identity (Sealey-Ruiz, 2007), and their academic and social engagement in class thus influencing their academic achievement (Gay, 2010; Ginsberg & Wlodkowski, 2009). In the AANAPISI LC, students read texts written by AAPI authors in the Asian American Literature course and developed their writing skills in the developmental English course. The instructors merged these two courses through classroom themes tied to the historical and current issues of their communities – a practice that has been found to be particularly effective because it situates learning within an individual's lived experience (Magolda & King, 2004).

Additionally, this LC, as opposed to other developmental courses not tied to an LC, included the following services: a) Comprehensive wrap-around support services (e.g., an embedded counselor providing services for students in- and out-of-class); b) AAPI culturally relevant, critical, and engaged pedagogies (e.g., critical reflection journals, AAPI community leaders as in-class speakers, small peer support groups called "Pamilyas," which translates into "families" in Tagalog); and c) AAPI culturally relevant, critical, and civic curriculum (e.g., students learn about AAPI history, especially as it relates to their communities). These practices

aimed to engage students in class, on campus, and their communities, with the goal of preparing and supporting students to transition into college-level coursework, increase persistence, and ultimately achieve transfer or earn a degree. AANAPISI grant funding enabled De Anza not only to provide these supplemental support services but also to target them toward AAPI students.

Methods

This study was part of a three-year research project to examine the impact of MSI grant-funded interventions on the educational success of racial/ethnic minority students. In this study we examined the impact of an MSI-funded developmental LC intervention at one community college. We gauge institutional performance by studying the added value of the AANAPISI-funded programs relative to student success utilizing de-identified data received from the participating institution. Some of the findings reported in this paper were highlighted in a previous report (see Teranishi et al., 2014); they are included in this paper to offer a comprehensive story about the impact of this AANAPISI-funded intervention for low-income AAPI students.

Measures

- Student Demographic Characteristics, including demographic data that indicate race and ethnicity, gender, age, and SES measured by whether or not the student had received an income-based Pell grant;
- Student Baseline Schooling Data, including full-time status, date of first enrollment, performance on the developmental literacy placement exam, enrollment in developmental English courses, and the academic term when they took the developmental English.
- Academic performance indicators, such as transition from developmental to college level English courses and the number of terms to qualify for the transition, credit completion in college-level English courses, and credit accumulation, and persistent enrollment from one semester to the next.
- Academic outcomes associated with longer term goals including degree attainment and the number of terms to graduation, and transfer from community college to four-year institutions.

Sampling Procedure

Because our research was conducted after the intervention was completed, we utilized a research design that enabled us to compare AAPI students in AANAPISI-funded programs (participant) to a representative comparison group of AAPI students (comparison group), derived from using propensity score matching (PSM) analysis. PSM reduces the bias due to confounding variables in arriving at estimates of treatment effects (Brand & Xie, 2010; Rosenbaum & Rubin, 1983). The participant group was comprised of 131 AAPI students who tested at the lowest level on the English placement exam (1 out of 4) enrolled in an AANAPISI-funded LC from spring 2009 to spring 2012. The comparison group was drawn from 872 AAPI students who did not participate in any LC but who also scored at the lowest level on the placement exam.

The propensity score matching was done based on the following student characteristics: age, gender, Pell grant recipient status, first term of enrollment, the academic period of intervention, and ethnicity. A logistic regression was used to generate the predicted propensity

score of each student based on these characteristics, and the nearest neighbor of each participant without replacement given the large pool in the full comparison group. For those with the same predicted propensity score, the matched student was chosen randomly. Propensity score matching was conducted separately for the participant group and the comparison group. The resulting matched groups comprised 118 students from the comparison group who most closely matched observable characteristics of the participant group (see Table 1 and Table 2). Missing data at random accounts for the incomplete match.

Table 1. Summary Statistics for Participant and Comparison Groups

Variable	Obs.	Mean	Std. Dev.	Min	Max
<i>Participants</i>					
Age	131	22.56	2.1774	18	30
Male	130	0.54	0.5004	0	1
Pell recipient	122	0.12	0.3297	0	1
<i>Matched Comparison Group (No LC)</i>					
Age	118	22.42	3.0504	19	41
Male	118	0.58	0.4963	0	1
Pell recipient	118	0.13	0.3345	0	1
<i>Full comparison group</i>					
Age	868	23.13	3.8638	18	54
Male	864	0.58	0.4942	0	1
Pell recipient	812	0.05	0.2113	0	1

Table 2. Ethnicity Match for Participants and Matched Comparison Group

	Participants	Matched group	Total
Cambodian	6	4	10
Chinese	35	37	72
Filipino	31	17	48
Guamanian	1	0	1
Indian	8	11	19
Korean	3	2	5
Other Asian	8	11	19
Other Pacific Islander	6	4	10
Vietnamese	33	32	65
Total	131	118	249

The logistic model, where y is a binary variable for treatment status and *firstterm*, *academicperiod*, and *ethnicity* consist of multiple binary variables for each term and ethnicity. *Age* refers to the age in years, *firstterm* refers to the term students were first enrolled in the college, and *academicperiod* refers to the term in which they took developmental English. In cases where students repeated the course, the initial term of enrollment was included. The logistic model is presented below. Figure 1 presents the PSM histograms before (untreated) and after matching (treated) which visually demonstrates a close match between the two groups.

$$y = \beta_0 + \beta_1(\text{age}) + \beta_2(\text{male}) + \beta_3(\text{Pell}) + \beta_4(\text{firstterm}) + \beta_5(\text{academicperiod}) + \beta_6(\text{ethnicity}) + \beta_7(\text{fulltime}) + \varepsilon$$

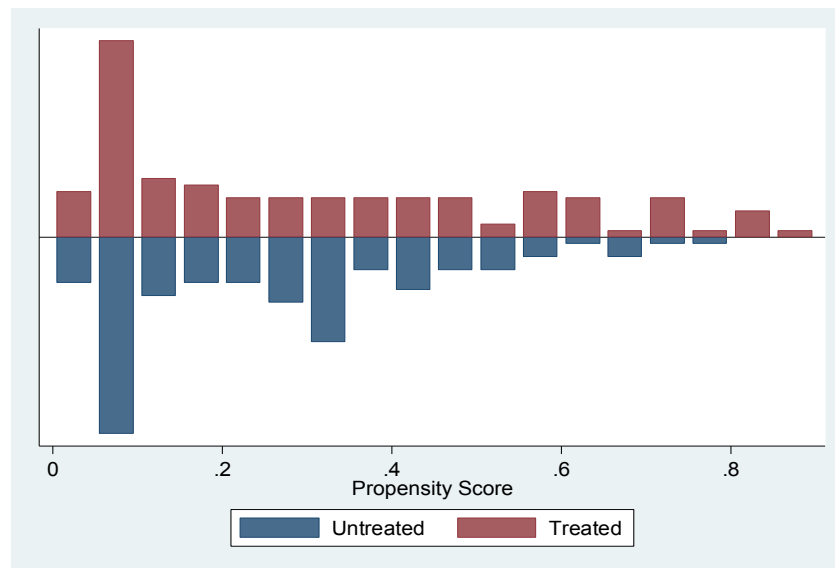


Figure 1. Propensity score histogram.

Data Analysis

To examine the impact of the intervention, we employed chi-square and *t*-test analyses to determine if differences in short-term and long-term outcomes were significantly different for students who participated in the intervention (LC) and students in the comparison groups (No LC). To determine if participants were more likely to transition into college level courses, and if transitioned were more likely to pass the college-level course, we employed a Chi-Squared Test for Independence, with Yeats' Correction for Continuity. Independent sample *t*-tests were conducted to compare the number of terms it took to transition to college level course work and overall credit completion rates for participants and the comparison group. In testing for the assumption of equal variances, we ran the Levine's Test for Equality of Variances, and in both cases, differences were found to be nonsignificant, therefore equal variance could be assumed. Similarly, we conducted chi-square analysis to determine if participants subsequently earn associates degrees and *t*-tests among the subset degree earners, to see if there was a significant difference in the number of terms it took, on average to graduate.

Results

Our findings reveal that through the various and simultaneous strategies employed within the LC, these practices contributed to the short- and long-term educational success of AAPI students.

Short-Term Outcomes

AAPI students in the AANAPISI LC experienced higher levels of short-term academic success, as measured by transition from developmental to college-level courses, time to transition, and pass rates in those courses. As Figure 2 highlights, for example, there is an

impressive difference in the transition rates from developmental to college-level English courses when comparing AAPI students in the LC (85.5%) to AAPI students who did not participate in any LC (54.2%) ($p < .01$).

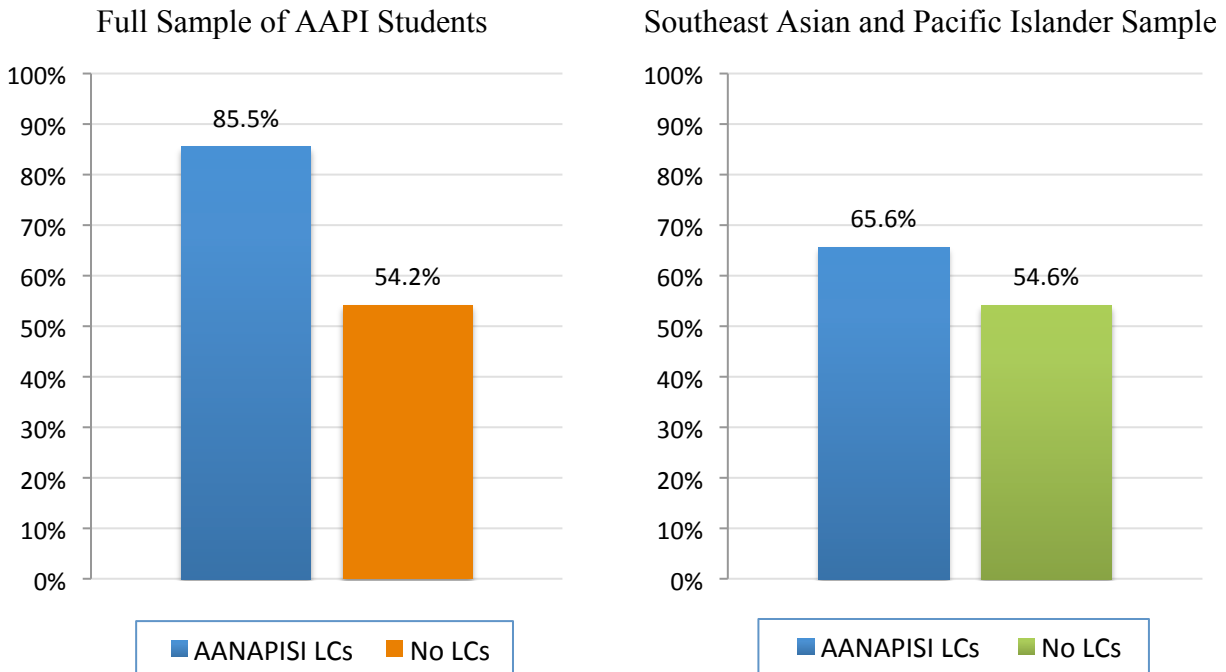


Figure 2. Percentage Transitioned to College-Level English. Full Sample $\chi^2_{(1)} = 30.97, p < .01$; Target Sample $\chi^2_{(1)} = 9.23, p < .01$

The short-term academic success experienced by all AAPI students enrolled in LCs was also true for the Southeast Asian and Pacific Islander students enrolled in the LCs at De Anza. These students were of particular focus for the institution, as De Anza College sought to address high rates of placement into developmental education courses, low transition and success rates (De Anza College, 2012) within these populations. Like the impact on the overall AAPI LC group, Southeast Asian and Pacific Islander subgroups in LCs experienced higher rates of transition and course success rates than their non-LC peers (65.6% vs 54.6% respectively, $p < .01$) (Figure 2).

AAPI students in the LC were also significantly more likely to transition into college-level English at a faster rate – within two terms following the intervention – as compared to non-LC students (2.2 terms vs. 2.9 terms respectively, $p < .05$) (Figure 3).

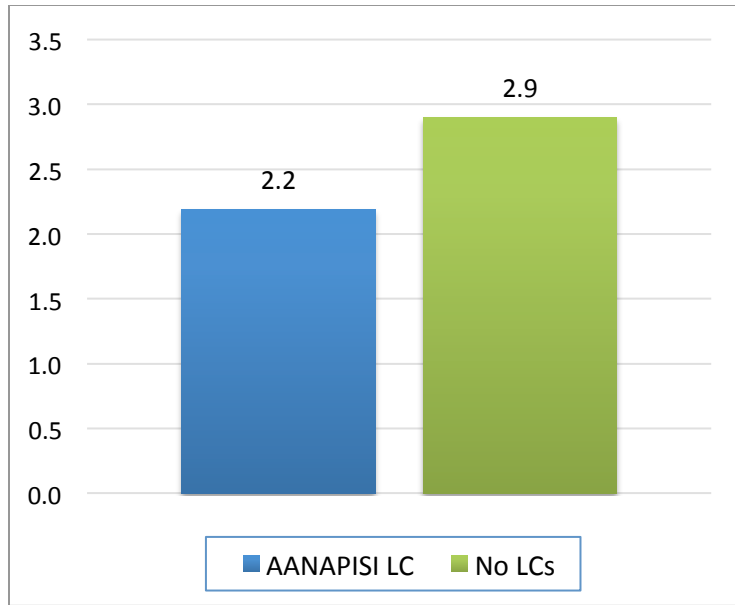


Figure 3. Average number of terms from intervention to college-level English. $t(170) = 2.50$, $p < .05$

This impact carries through as LC students are also more much likely to pass their college-level English courses, as compared to non-LC students (86.5% vs. 50.9% respectively) in the semester following their enrollment in the intervention ($p < .01$) (Figure 4).

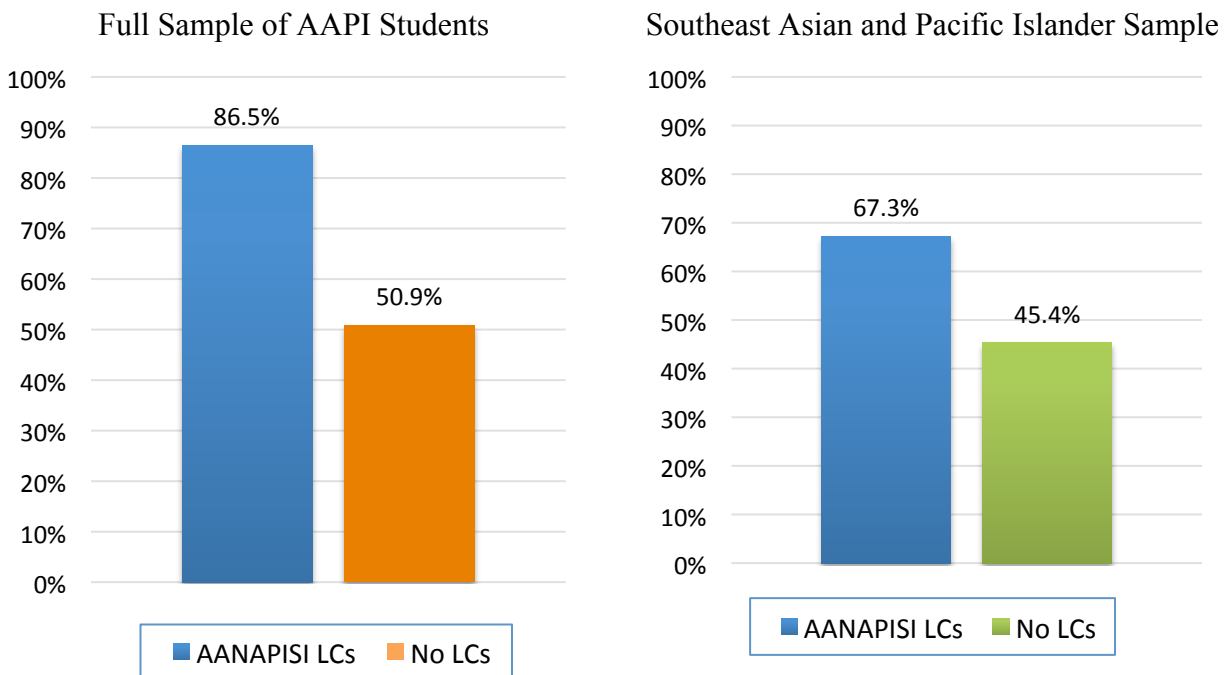


Figure 4. Percentage who passed college-level English course, among students who originated from developmental English courses. Full Sample $\chi^2_{(1)} = 34.89$, $p < .01$; Target Sample $\chi^2_{(1)} = 13.14$, $p < .01$

Our findings also revealed the difference in course passing rates for Southeast Asians and Pacific Islanders; 67.3 percent of these students in LCs passed their college-level English class, as compared to only 45.4 percent of their non-LC peers ($p < .01$). Given these statistically significant findings for a group of students who experience some of the lowest educational attainment rates in the nation (Teranishi, Lok, & Nguyen, 2013), LCs offer a promising opportunity for improving the academic outcomes of some of the most underserved students and warrant further attention.

In addition to these findings, we also compared LC and non-LC students for the mean passing rate for *all* courses taken during the term of the intervention, as well as one term following the intervention (see Figure 5). We found that LC students had a higher course-passing rate one term following the intervention ($p < .01$). Although not significant, students in the LC had higher course passing rates in the term of intervention than students not in the LC. Additionally, while LC students and non-LC students had similar rates of credits attempted, the higher course passing rate among LC students resulted in higher mean number of credits earned both in the term of the intervention (14.1 vs. 13.2) and the term following the intervention (12.7 vs. 12.4).

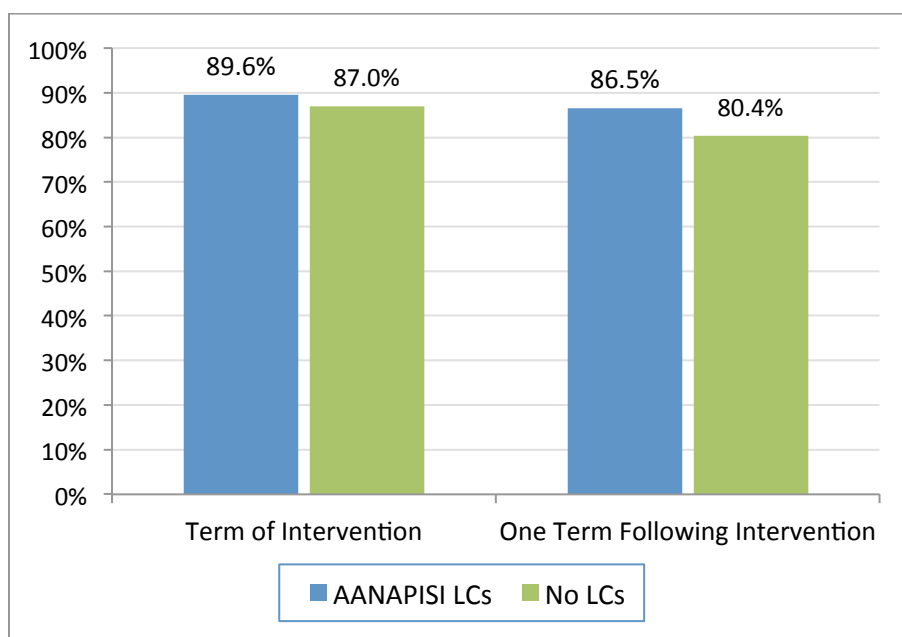


Figure 5. Course passing rates in term of intervention and one term following intervention. Term of intervention, nonsignificant; One term following, $t(170) = -4.37, p < .01$

Long-Term Outcomes

In addition to short-term outcomes, we also examined the impact of LCs on the long-term academic outcomes of students, which are measured by persistence, transfer, and degree attainment. Of these three outcomes, our findings, first, importantly reveal LC participants were more likely than non-LCs to graduate with an associate degree or certificate.

In fact, 18.8 percent of those enrolled in the LC earned an associate degree, while only 4.1 percent of students not enrolled in any LC achieved the same success—a significant difference in attainment rates ($p < .01$) (Figure 6). This is an important finding given that most community college students who are placed in developmental education do not earn a college

degree (Bailey, 2009) and situates the findings of this study within national education priorities focusing on completion. Additionally this success was achieved in a shorter, but nonsignificant period of time ($p < .10$); AAPI students in the LC did so in 8.1 quarters, as compared to 9.0 quarters for their non-LC counterparts (Figure 6).

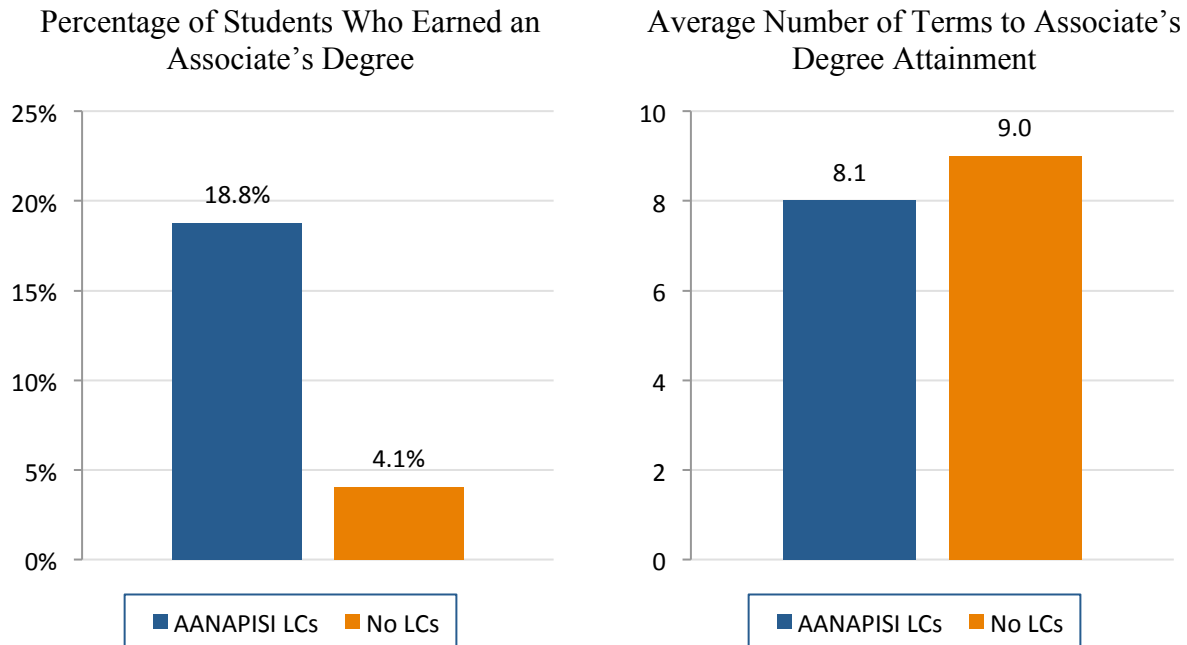


Figure 6. Percentage of students who earned an associate's degree and time to degree. Full sample $\chi^2_{(1)} = 7.35, p < .01$; Number of terms $t(170) = 1.68, p < .10$

Finally, although not statistically significant, LC students had a greater likelihood of transferring to a four-year college compared to non-LC students (Figure 7). Also, LC students who transferred did so in less time compared to non-LC students who transferred. These findings were not statistically significant, which may be a result of a small sample size, especially this many terms following the intervention. However, these findings provide valuable context for understanding the significance of the transfer rates and are accordingly included. Moreover, given the high attrition rates, and low degree attainment and transfer rates for community college students who are placed in developmental education (Bailey, 2009), these findings point to a need to further examine learning communities as an approach to improve the long-term educational success of students, especially for racial/ethnic minority students at MSIs.

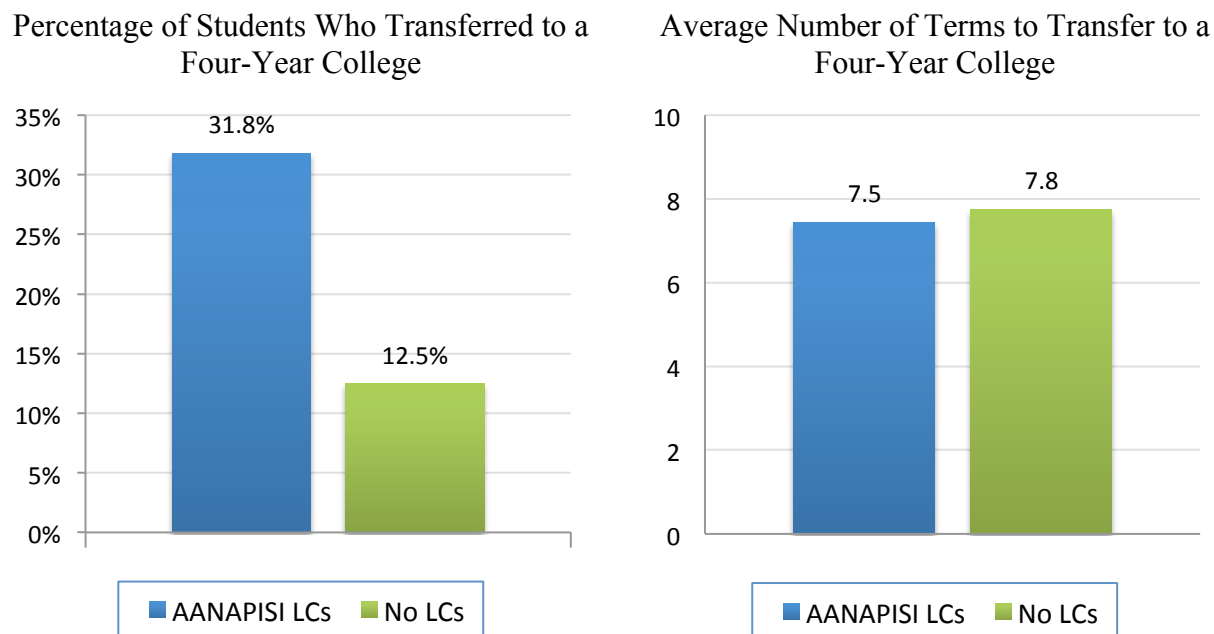


Figure 7. Percentage of students who transferred to a four-year college and the number of terms to transfer. This includes students who transferred with and without earning an associate's degree; findings nonsignificant.

Discussion

This research adds to the literature on developmental education, learning communities, educational outcomes of AAPI community college students, and the impact of MSIs. Overall, we found that, on average, AAPI students in developmental education LCs were more academically successful than students not enrolled in LCs. AAPI students who participated in the AANAPISI-LC had a significantly higher rate of transitioning to college-level coursework and in shorter time, and also passed their college-level English course at much higher rates than non-LC AAPI students in developmental education. Additionally, AAPI students in the AANAPISI-funded LC were much more likely to earn a degree or certificate than students not in LCs. Finally, the institution had success in utilizing LCs to improve outcomes for their target populations – Southeast Asians and Pacific Islanders. Given the barrier developmental education often creates for students in their path toward earning a degree or transferring to four-year institutions, these findings are critical for considering strategies and interventions that can improve the academic outcomes of underrepresented students in community colleges (Bailey, 2009; Bailey & Cho, 2010). Especially when we consider the return on investment of AANAPISIs.

Equally important to consider is the length of time it takes students to transition from remedial to college-level courses, as it relates to the likelihood of persistence and degree attainment of community college students (Complete College America, 2011). LCs can play a critical role in mitigating the amount of time it takes students to transfer or earn a degree (Scrivener et. al, 2008). The findings from this study corroborate the findings of previous studies which find students in developmental English LCs pass and transition to college-level English in lesser time than students who do not benefit from LCs (Scrivener et. al, 2008).

Given the need to improve passing rates, persistence, and degree attainment of students in developmental education, LCs may provide an added value to the capacity of an institution in

improving outcomes for students. The targeted MSI-funded LC showed improved academic success of low-income AAPI students over similar non-LC students. Overall, these findings are critical for considering the approaches that may move the academic needle, or bring added value, to improve outcomes for community college students. Given that approximately 60 percent of all students entering community college enroll in at least one developmental education course (Bailey, 2009) while very few go on to earn degrees or transfer, opportunities for improving their degree attainment are worthy of further exploration.

These findings also point to the importance of MSI funding in allowing MSIs the opportunity to incorporate interventions to improve student outcomes, with particular attention to low-income students of color. Without the AANAPISI funding, De Anza College would not have had the opportunity to incorporate an AAPI-focused LC to improve the academic success of students. This study also highlights the challenges associated with studies of grant-funded programs, given that these programs target a small number of students and for a short period of time, which limits opportunities for more rigorous statistical analysis, and the ability to identify statistically significant results. This is particularly challenging for longitudinal studies since the longer students are enrolled in college, the higher the attrition rate, which further reduces the sample size and raises the risk of having nonsignificant results.

Limitations

This study has some notable limitations that should be considered for future studies on cohort programs utilizing quasi-experimental designs. First, in this study we examined an LC at one site; therefore the findings cannot be generalized to other programs, schools, or student populations. However, the findings from this study are comparable to other studies on LCs (Baker & Pomerantz, 2000; Bloom, & Sommo, 2005; Tinto, 1998; Tinto, Goodsell-Love, & Russo, 1994; Tinto, Russo, & Kadel, 1994). Second, experimental and random assignment research designs are the gold standard for assessing the impact of interventions on groups of people (Cohen, Brawer, & Kisker, 2014). Although we were not able to take an experimental approach, utilizing a PSM technique allowed us to compare the educational outcomes of students who placed in the same level of developmental education with similar characteristics (e.g., ethnicity); thus eliminating bias due to certain confounding variables, but could not account for all of them, most notably the role of scheduling convenience and opportunity to enroll in the intervention course.

Moreover we could not determine with full confidence the extent to which selection bias may have been a factor in the comparability of our treatment and control groups. That said, additional qualitative research we conducted suggests that many participants ended up in the interventions as a result of convenience (e.g., scheduling and availability) as opposed to other factors. The AANAPISI LC was offered in the daytime four days a week. Interviews with the AANAPISI program staff at De Anza College revealed that all enrolled AAPI students who qualified for the developmental English course were contacted, via email and phone calls, about the opportunity to participate in the AANAPISI LC. However only students whose schedules permitted were able to enroll in the course. We are confident that, while imperfect, our matched comparison groups offer worthwhile comparisons.

Furthermore, the small sample sizes of the AAPI students in the AANAPISI LC generally and the targeted Southeast Asian and Pacific Islanders specifically could have resulted in findings not being statistically significant. However, a nonsignificant finding does not mean these findings are not notable (Faircloth, Alcantar, & Stage, 2015). The same is true for the

limited time that had passed for measuring outcomes longitudinally. Potentially, there was not enough time that had passed to demonstrate a statistically significant impact on long-term outcomes such as transfer and degree attainment, but our ability to conduct analysis on longer-term outcomes was negatively affected by attrition and shrinking sample sizes.

Lastly, another limitation to this study is that although we can speculate that the various components of the LC made a difference in the student outcomes, we cannot determine what about the LC made this difference. For example, was the difference in outcomes due to taking the course itself or was it the embedded services? This question may be more appropriately addressed through qualitative research.

Implications for Research, Policy, and Practice

A primary goal of the AANAPISI program is to afford campuses an opportunity to experiment with practices that help students reach their full degree-seeking potential. This analysis demonstrates the potential impact on the number of AAPI students who could transition from developmental to college-level English at De Anza College if given the opportunity to have more students participate in LCs. More studies like this are needed to demonstrate where MSI funding is being invested and how MSI-funded programs and services impact the educational outcomes of low-income students of color.

These findings also underscore the importance of ongoing assessment to guide institutional decision-making processes in order to maximize the impact of increased resources and opportunities. The significant improvement in outcomes for the students who participated in the programs funded by the AANAPISI grant, and the potential campus wide impact of fully-scaled programs, demonstrate the critical role that MSIs play in achieving the nation's higher education agenda.

Moreover, these findings present additional implications for research, policy, and practice that are relevant, not just to AANAPISIs, but all MSIs. These include:

Research

- While federal funding has supported the foundational and impactful work of AANAPISIs, and other MSIs, the extant literature on MSIs has focused primarily on the outcomes of such programs, services and practices. Accordingly, there remains a need for rigorous research that extrapolates specifically on the link between funding and outcomes for the underrepresented students served at MSIs.
- Although there is a growing body of literature on the success of MSIs in improving the academic experiences and outcomes of underrepresented students, there is a need to contribute explicit research on how MSIs, cumulatively, move the academic success needle, particularly within the context of national higher education priorities, like the college completion agenda.

Policy

- Federal funding allows institutions to develop programs that directly support the success of underrepresented students and increase institutional capacity to improve academic success (e.g. degree attainment). Accordingly, financial support for institutions serving the nation's most underserved populations is critical.
- Studies like this one provide an excellent policy opportunity to disseminate and scale up

best practices in order to broaden the education sector's reach in improving educational outcomes.

- Given the limited capacity AANAPISIs, and all other MSIs, often face, there is a need to support the development of assessment practices that helps to sustain successful institutional initiatives and drives innovative research that makes the case for MSIs.
- Government and foundations play a critical role as partners who can provide opportunities to further MSI programs and services empirically demonstrated to improve academic success.

Practice

- Interventions should target a particular academic barrier identified on campus (e.g. transition from developmental to college level coursework). More narrow goals help to define program goals, activities and thus, measures of success. This also provides a strong foundation for institutional buy-in, a key component of successful interventions.
- Institutional research that can contribute to the intervention's assessment process is critical to the immediate and long-term success of the intervention, as it defines the measure for program success and helps to sustain future efforts.
- Evidence of success should drive efforts to replicate and scale up programs. These findings should also be shared with a broader audience outside the institution.
- The engagement of campus constituents in regards to the intervention broadly, and the assessments specifically, are a necessary component to situate the efforts within institutional priorities and to generate buy-in for the program's continued existence and success.

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