ABSTRACT

Please provide a brief abstract—250 words or less—about the application. This abstract will be used in summary documents produced by the Chancellor's Office staff. (1,800 characters with spaces)

Aligned with the Chancellor's Vision for Success, the Foothill-De Anza Community College District is committed to improving student success and closing the achievement gap among underrepresented students through the use of innovative practices. One approach that has been proven to close the equity gap among underrepresented students is the Math Performance Success (MPS) Program at De Anza College.

MPS is a learning community that provides underrepresented students with 1) embedded counseling, 2) in-class tutoring, 3) extended class time, 4) use of a technology-equipped center, 5) a one-year track to finish transfer-level math, and 6) two mathematics pathways: Traditional Support Pathway to the completion of transfer-level statistics, and STEM Support Pathway to the completion of pre-Calculus.

Comparing MPS to non-MPS classes:
• MPS course success rates are 17 percentage points higher.
• MPS cohort sequence success rates are 30-53 percentage points higher.
• MPS student transfer rate is 29% higher.
• MPS has successfully closed the equity gap (-4% MPS, 19% non-MPS).

Funds will be used to scale-up MPS district-wide, with two expansions:
1) Implementing MPS Traditional Support Pathway (Foothill College).
2) Expanding MPS STEM Support Pathway (De Anza College).

The objective of this scale-up is to increase the share and number of underrepresented students completing transfer-level math within one year for both non-STEM and STEM majors. This expansion will increase the number of MPS students served by 37%.

MPS will continue and expand efforts to disseminate program information so that with the support of the Chancellor's office other institutions can replicate the MPS model.

NARRATIVE RESPONSES

Each response is limited to a 500 word narrative. Additional data or charts can be uploaded as a .pdf for each question. There is a 25 mb maximum for additional materials uploaded per question. For instructions on strong responses to each question, please refer to the Questions and Strong Responses document.

* 1. From the perspective of the student population, referred to in the introduction, what was the problem your innovation helped to address on your campus, college or district?

"I got my placement score and found out I had to take a year of algebra before I was able to take college math, I wanted to quit before I even started! I felt like I wasn't good enough for college." -Ben Campbell, Student

The statement above is an all too common theme in post-secondary education. When students begin in developmental math, they must overcome the disappointment of discovering they are underprepared to succeed at the college level. Disappointment can negatively impact persistence and retention [1]. For Foothill-De Anza Community College District, the current rate of progression for students starting two-levels below transfer-level math to transfer-level statistics is 34% for non-target students, and 24% for target* group students (2014-2017 cohort)[2]. For STEM majors, the rate of success starting two-levels below transfer math to the first Calculus course is 7% for non-target students, and 2% for target group students[2]. These low rates may change significantly with the implementation of AB 705, but efforts will still need to take place to improve success rates in basic skills math and pre-Calculus courses, especially for our underserved student populations.

Not only are completion rates extremely low for underrepresented students, but underrepresented groups are

disproportionately overrepresented in basic skills math classes and disproportionately underrepresented in Calculus courses. While 35% of De Anza students belong to a target group, the same group represents 55% of enrollment in basic skills math. In contrast, the enrollment of target groups in the highest levels of math is only 11% (Table 1)**[3]. These inequities, paired with low success rates, lead to large achievement gaps. Math courses exhibit some of the largest equity-gaps on our campus, especially in basic skills math[3].

The problems facing nearly all community colleges, including the Foothill-De Anza District is that:
1) There is a disproportionate representation of students of color in basic skills math classes.
2) The rate of completion from basic skills math to transfer-level math is low for underrepresented groups and for students overall.
3) Equity gaps exist, especially in basic skills.
4) Math poses as a barrier to transfer and even more so to the attainment of a STEM degree.

In order to address the needs of our underrepresented populations persisting and completing transfer-level math within a year, and ultimately closing the equity gap, De Anza College implemented the Math Performance Success (MPS) Program, a student support model designed for underrepresented students taking basic skills math. Foothill-De Anza District also implemented Statway [4], an accelerated pathway to the completion of statistics for non-STEM majors. Although Statway is successful, the program is limited to serving a specific subset of non-STEM majors. The focus of this proposed expansion is to scale up MPS in order to effectively increase the share of underrepresented students successfully finishing 1) a general transfer-level math course within a year or 2) a STEM transfer-level math course within a year.

*Target refers to African American, Latino, Filipino, Pacific Islander or Native American students
**Tables and figures for each question are attached.

ADDITIONAL DATA:Table 1.pdf uploaded.

* 2. Briefly describe the practice or policy that your campus, college or district needed to change. Precisely describe the innovation and how it addressed the problem outlined in question 1.

“MPS is the best thing that happened to me. Math was difficult. Thanks to professors, tutors, and counselors, I’m FINALLY completing my math requirements” -Saul Gembe, Student

The Math Performance Success (MPS) Program at De Anza College was launched when its faculty creator and first director Dr. Carolyn Wilkins-Greene noticed that African American students were delaying transfer because of algebra. After extensive research on innovations for student success, specifically for students of color, she formed a learning community comprised of a counselor, tutor, math teacher, and cohort of 20 African American students. This new learning community, named the Math Performance Success Program, started with algebra and continued through transfer-level statistics. With the success of this first cohort, the following year MPS was opened to all underrepresented students. Today the majority of MPS students (76%) continue to belong to underrepresented groups.

With the success of MPS serving as a Traditional Support Pathway to the completion of statistics, an extension was added, a STEM Support Pathway (Figure 1). Now a cohort of STEM majors can receive the continued support of MPS while taking the pre-Calculus series. The proposed scale-up presented here will expand the STEM Support Pathway at De Anza to encourage more underrepresented students to consider STEM majors.

The innovative design of MPS supports the Chancellor’s Vision for Success Commitments[5] in the following ways:
• MPS is designed with the student in mind offering:
− A cohort learning community (completing the entire math sequence with the same professor, counselor and classmates).
− Affordable textbook alternatives (instructor-developed and open-resource textbooks).
− Exclusive tutoring center equipped with technology-enhanced learning resources.
− Double classroom time for the same unit-load as a non-MPS class.
− UCs, CSUs, and industry partner visits.

• MPS pairs expectations with high support by providing students:
− Intrusive counseling (inside/outside the classroom).
− In-class, drop-in, and 1-on-1 tutor support.
− Counselor-led student success and mindfulness workshops.

• MPS is leading the work through partnerships:
− Campus-wide, MPS collaborates with student support programs to better serve students.

− District-wide, De Anza and Foothill Colleges are working together to implement the expansion of MPS to Foothill.
− Regionally, MPS and Outreach teams inform high schools about MPS, multiple measures, and high-stakes placement exams.

• MPS is focused on students' end goals, and provides two clear pathways, MPS Traditional Support Pathway and MPS STEM Support Pathway, to the completion of transfer-level math within a year.

• MPS fosters the use of data by collaborating with the De Anza Institutional Research office to provide data on program effectiveness in order to make thoughtful, data-driven decisions on MPS expansions and needs.

MPS supports the Chancellor's Vision for Success[5]. Of all the MPS features listed, embedded counseling is KEY to MPS success. Inside the classroom, counselors work with faculty to provide students with progress reports. Outside the classroom, counselors meet with students for case management and educational plan updates. Counseling is a critical piece of the program, and a large portion of the requested funding is used to support this component.

ADDITIONAL DATA:Figure 1.pdf uploaded.

* 3. How did your campus, college or district scale, or begin to scale, this innovation?

PRIMARY MPS EXPANSION
The Math Performance Success (MPS) Program was designed to provide African American students with a learning community and embedded student services, in order to complete a transferable math course[6]. Resources for piloting MPS included one counselor and one tutor, both borrowed from other programs. Although resources were limited, the success of the MPS program was immediate. Within two years, MPS was awarded funds from the Partnerships for Excellence (PFE), which paid for a full-time MPS counselor. Because of the continued success of the MPS program, the MPS counselor position is now funded by the college. From the conception of the program, MPS has had overwhelming support from the district chancellor (who requested the first round of PFE funding when she was at De Anza), college senior administrators, and math and counseling faculty, who have all encouraged and assisted with the continued expansion of MPS. Today MPS caters to over 455 basic skills students each quarter. Even with the large number of MPS students served, MPS only reaches 5% of pre-Calculus students at De Anza. The proposed expansion of MPS is necessary to meet the needs of our underrepresented students in basic skills math and beyond, especially with the upcoming implementation of AB 705.

MPS EQUALS SUCCESS
Recent comparisons show that MPS students outperform non-MPS students across the board[3,7].
• Transfer rate for MPS students is 29% higher than for non-MPS students.
• Basic skills course success rate in MPS is, on average, 17 percentage points higher than in non-MPS (Figure 2).
• Pre-Calculus course success rate in MPS is 13 percentage points higher than in non-MPS.
• Math sequence success rates (within a year) in MPS are higher compared to non-MPS by (Figure 3):
− 30 percentage points for students beginning 2-levels below transfer
− 53 percentage points for students beginning 1-level below transfer
• MPS participation is correlated with an increased grade point average of 0.2 points.
• MPS participation is correlated with passing an additional 0.5 courses per term.
• The MPS program has successfully closed the equity gap, (Non-MPS=19%; MPS=-4%) (Figure 4).

MPS PROPOSED DISTRICT-WIDE EXPANSION
Providing embedded support services beginning at basic skills math and extending through pre-Calculus has proven to help underrepresented students persist and complete their required math courses. Since the MPS Traditional Support Pathway and MPS STEM Support Pathway are well-established at De Anza College, expansion of the program on campus and throughout the district will be straightforward to implement.

Funding from the Innovation for Higher Education Award will be used to scale-up the successful and innovative MPS Program, with two proposed expansions:
1) Implement the MPS Traditional Support Pathway to Foothill College and offer 4 sections of MPS per quarter at Foothill.
2) Expand the MPS STEM Support Pathway at De Anza College by increasing the number of cohorts served from 1 cohort/year to 5 cohorts/year.

This proposed expansion will increase the number students served per quarter by 37% on both campuses (from 455 to 630 students/quarter) for a total of 1,890 students per year.

ADDITIONAL DATA:Figure 2,3,4.pdf uploaded.

* 4. Explain in detail the specific barriers that were addressed to begin scaling the innovation across the campus, college or district.

1) The instructor and learning challenges to scale up the Math Performance Success (MPS) Program included:
• Finding effective ways of teaching math to students who have struggled in math, sometimes as early as middle school.
• Understanding that learning barriers are often not content driven, but derive from other circumstances in the students' lives.
• Maintain optimism, for students and instructors, to overcome the years of failure encountered by many basic skills students.

MPS instructors were fortunate to be part of the Foothill-De Anza District, which strongly values the goal of providing a path for all students to succeed. The district offered numerous professional development opportunities that addressed the special instructional and human relations needed to successfully work with basic skills students, including various approaches from active learning to mindfulness training. Innovative practices were further shared through a MPS Professional Support Cohort, where faculty and counselors met weekly to discuss techniques, difficulties and solutions. Lastly, although many MPS students struggle with math content, financial hardships, and/or psychological issues, these factors were largely alleviated through embedded counseling, tutoring, mindfulness training, and a cohort "family" model.

2) Administrative challenges with scaling-up MPS included:
• Justification for additional resources required to expand and sustain MPS.
• Recruiting and training MPS counselors and peer tutors.

Overcoming these administrative challenges has largely been due to the strong commitment of faculty and administration toward meaningful solutions related to equity and basic skills education. From the conception of MPS, the Institutional Research office at De Anza monitored the program's effectiveness and immediately reported high MPS success rates, especially for underrepresented groups. High success rates justified to administrators the need to expand MPS from initially serving just 20 students to now serving over 455 students/quarter. To further justify MPS expansion and sustainability, it was found that long-term success rates resulted in an effective throughput of students 4-5 times greater in MPS than non-MPS courses. This throughput allowed for an overall reduction in the number of math sections offered, which in-turn reduced instructional expenses that more than compensated for the additional resources.
Surprisingly, the greatest hurdle is not program expense, but instead recruiting and training MPS counselors and peer tutors. In the past, it was difficult to recruit counselors from the counseling department who were willing to work in the classroom and directly with mathematics faculty, unlike their traditional model of having students come to them. This challenge has been resolved by senior administration's commitment to hire counselors dedicated solely to MPS. Currently two of our MPS counselors are former MPS graduates.
To overcome the challenge of recruiting motivated and patient tutors that can work with basic skills students, MPS began hiring faculty-recommended former MPS students. These tutors also served as role models to those who are currently in MPS and who may doubt whether they can succeed in college. Because peer tutors work with students that may have math anxiety and learning disabilities, tutors received ongoing training and support from the Student Success Center and MPS staff.

ADDITIONAL DATA:No file uploaded.

* 5. Explain how your campus or district will collaborate with the Chancellor's Office to disseminate this innovation throughout the state to benefit other colleges seeking to solve a student success issue.

REGIONAL DISSEMINATION
With the recognition the Math Performance Success (MPS) program has received, including being listed as a BSI Model Program by California Community Colleges Chancellor's Office8, the MPS team has been busy showcasing the program and its success at various conferences, including the Institutional Effectiveness Partnership Initiative

BSSOT, the RP Group Strengthening Student Success Conference, the CCC BSSOT Kick-Off Summit, and a variety of local and national presentations for the League of Innovation. As a result of our participation in the above conferences, we have been requested by colleges (Butte College, College of Marin, SJCC, etc.) to hold follow-up workshops detailing the logistics of MPS. We have presented such workshops at Gavilan and Diablo Valley colleges. MPS further plans to formalize a “Visiting MPS Day” where colleges can learn about MPS and experience the effectiveness of embedded resources in the classroom.

Small teams of instructors, counselors, staff, and students will continue to attend and present on MPS at math-based, student equity, and basic skills conferences such as the American Mathematical Association of Two-Year Colleges (AMATYC) Annual Conference, California Mathematics Council Community Colleges (CMC3) Fall Conference, RP Conference, California Community Colleges’ Success Network (3CSN), NCORE, STEM Innovation Conference and the AMS/MAA Joint Meetings. There is also potential for MPS to be folded into a Bay Area Community College Consortium Strong Workforce Initiative. In the future, MPS plans to focus more on online platforms and social media to assist in outreach efforts to high school and colleges statewide

DISTRICT-WIDE DISSEMINATION
This year the district chancellor asked MPS to present to the Foothill-De Anza District Opening Day, with over 2000 attendees. As a result of this presentation, representatives from Foothill College expressed interest in collaborating with De Anza to bring MPS to Foothill. This district-wide partnership committee meets on a regular basis to discuss the implementation of MPS at Foothill College for Fall 2018. A portion of funds from this grant will go into building this district-wide collaboration and expanding MPS to Foothill.

HIGH SCHOOL DISSEMINATION
MPS and the De Anza Outreach team have been in contact with over 10 high school partners, disseminating information about MPS through college fairs, high school classroom presentations, and high school counselor conferences. MPS also annually presents at the Latinx and African American High School Conference that has over 1000 high school students of color in attendance.

CAMPUS-WIDE DISSEMINATION
MPS works with over 20 campus services and programs, including but not limited to EOPS, Disability Services, Veterans Services, Puente, Umoja, FYE, Men of Color Initiative, and Athletics. MPS collaborates with counselors from these programs for recruitment purposes, but more importantly to better “streamline” students’ to their end goals.

With robust dissemination efforts, we hope MORE institutions will be inspired by MPS, and with the support of the Chancellor’s Office replicate the MPS model. A program role chart of responsible individuals involved in MPS is attached. Also attached are the estimated costs and action plan, including activities and timelines.

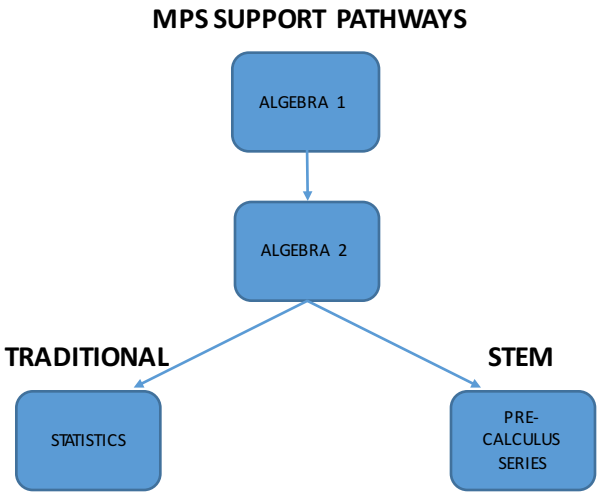

Figure 1. MPS Support Pathways: MPS Traditional Support Pathway and MPS STEM Support Pathway.

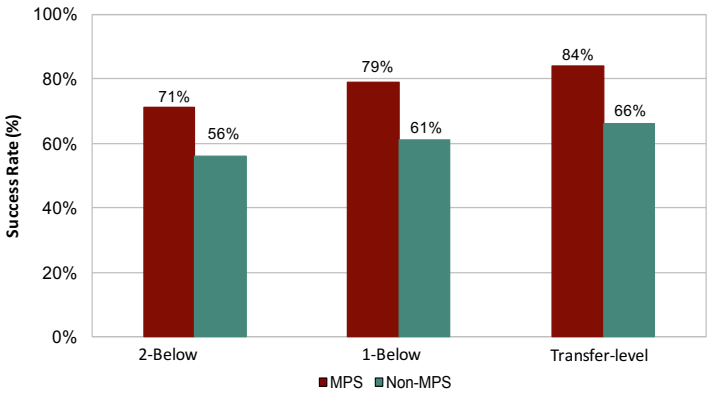

Figure 2. Comparison of course success rates between MPS vs. non-MPS students (averaged from 2012-17).

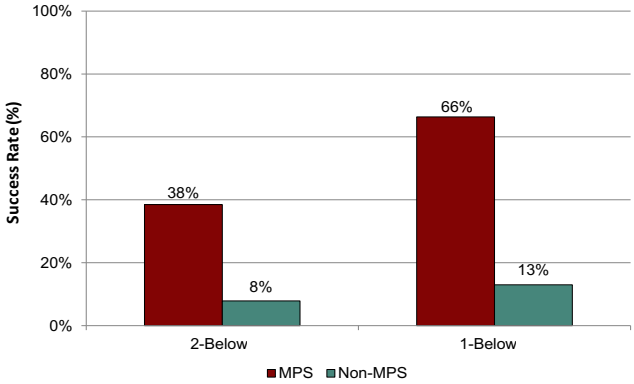

Figure 3. Comparison of transfer-level completion rates within one year between MPS vs non-MPS starting at 2-levels below and 1-level below, respectively.

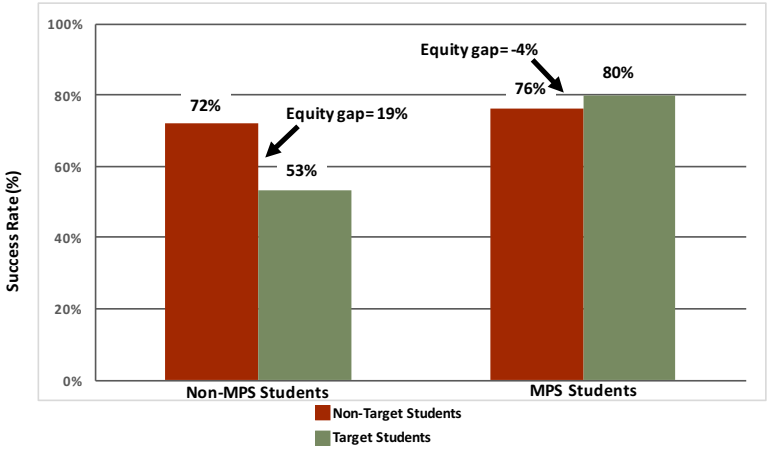

Figure 4. Success rates in transfer-level statistics comparing non-MPS non-target students versus non-MPS target students and MPS non-target students versus MPS target students. The equity gap in non-MPS is 19%, while in MPS the equity gap is -4% (2016-17).

ALGEBRA 1	ALGEBRA 2	ALGEBRA 3	PRE-CALCULUS 1	PRE-CALCULUS 2	CALCULUS 1	CALCULUS 2	CALCULUS 3
70%	64%	54%	35%	28%	17%	15%	11%

Table 1. Percent of underrepresented students enrolled in designated math courses. Data from 2016-17 academic year.

REFERENCES

1. Venezia, A., Bracco, K. R., & Nodine, T. *One-shot deal? Students' perceptions of assessment and course placement in California's community colleges*. San Francisco: WestEd, 2010.

2. CCCCO Basic Skills Cohort Progress Tracker, Fall 2014-Spring 2017.

3. Foothill-De Anza College District Online Program Review Data Tool, 2012-2017.

4. Carnegie Foundation for the Advancement of Teaching, STATWAY: A Statistics Pathway for college students., Stanford, CA, 2011.

5. California Community College Chancellor's Office, *Vision for Success: Strengthening the California Community Colleges to Meet California's Needs,* July 2017.

6. Bailey, Thomas R., Shanna Smith Jaggars, and Davis Jenkins. *Redesigning America's Community Colleges: A Clearer Path to Student Success*. Cambridge, Massachusetts: Harvard University Press, 2015.

7. Hanover Research Group, *The Math Performance Success Program Evaluation*, 2015.

8. Boroch, D., Fillpot, J., Hope, L., Johnstone, R., Mery, P., Serban, A., Gabriner, R. S. *Basic skills as a foundation for student success in California community colleges.* Sacramento: Center for Student Success, Research and Planning Group, Chancellor's Office, California Community Colleges. http://css.rpgroup.org , 2007.