



MATH PIPELINE READINESS PROJECT (M-PREP)

Year 3 Annual Report

Abstract

A longitudinal project to improve college outcomes through the K-16 alignment of math education and college knowledge in Southern and Central California.

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EXECUTIVE SUMMARY

K-12 schools throughout California closed abruptly on Friday, March 13, 2020 due to the COVID-19 pandemic. Districts initially announced closures spanning one-two weeks with a few districts extending through the upcoming spring break. During this time K-12 teachers were asked to halt instruction as not to create inequitable experiences for students with or without access via technology and internet. Within a month of the school closures, College Bridge shifted the M-PreP research project to study the impact of COVID-19 on college matriculation and retention. This report will show findings of our research on the following:

In what ways does participation in M-PreP impact:

- students' college math readiness?
- earned college credit in math (pre-calculus, calculus, statistics)?
- college matriculation?
- college retention?
- college completion?

39% of M-PreP Students were CSU Math Ready and 47% were Ready for CCC mathematics.

The multiple and competing definitions of college readiness make it difficult to determine how best to prepare students for higher education. College Bridge uses the following definition: A student is academically prepared for college if he/she is eligible to be placed in college-level courses without the need for additional support.

83% of SLAM students earned college credit in mathematics.

Of the high school graduating classes of 2018, 2019, and 2020, 83% passed a college-level math class with a grade of C- or higher. An area of interest to the research team was the rate of students taking STEM pathways in college. While the rate of students who took SLAM Pre-Calculus choosing a STEM pathway is six percentage points higher than students who took SLAM Statistics, the fact that 59% of the latter pursuing STEM is notable.

97% of SLAM students attended college immediately after high school graduation.

Nearly half of the students attending college chose to enroll at a California State University campus which aligns with the intention of the SLAM program in which students earn CSU General Education credit for section B4 Mathematics/Quantitative Reasoning.

SLAM alumni persisted through COVID related campus closures in Spring 2020

78% of students remained enrolled throughout the Spring semester, with only 22% of students dropping one or more classes at the onset of COVID.

SLAM students meet or exceed state college retention rates.

Overall, SLAM students from both 2017 and 2018 are exceeding retention rates at the California State University. Two-thirds of the 2018 cohort have completed two years of college and are on track to graduate in four years. After three years of college, more than 80% of the 2017 cohort is on track to graduation, split almost evenly between a four- and five-year track.

M-PreP's first college graduates.

A total of ten M-PreP students who participated in SLAM have graduated from college.

INTRODUCTION

The California State University (CSU), the largest four-year public university system in the nation, has historically struggled with low graduation rates (Jackson & Cook, 2016) mainly due to their incoming students' academic under-preparation (Hall, 2018). Similarly, the California Community Colleges (CCC), the largest system of higher education in the United States, has faced numerous challenges increasing their completion (associate degree/certificate and/or transfer) rates chiefly as a result of their inherent mandate to provide remedial instruction to all students who need it (Beach, 2012). While both systems have cycled through different approaches to increase their completion rates, challenges related to students arriving unprepared for college have continually beleaguered both the students and the institutions.

THE NEED

Two major roadblocks students face on their path toward college graduation are math under-preparation and the lack of a post-secondary plan. Students who matriculate into college without being fully prepared in mathematics face a higher probability of dropping out in their first year (Scott-Clayton & Rodriguez, 2015). Similarly, arriving on a college campus without a cogent strategy hinders students' progress toward graduation. This is particularly acute for underrepresented (low-income, minority, and first-generation) college students who tend to face multiple barriers simultaneously (Page & Scott-Clayton, 2016). Dropping out of college exacerbates the cycle of trans-generational poverty by leaving students with educational loan debts and no degree to show for it. It also places California in the challenging position of being unable to address its workforce development needs. Specifically, if current trends continue, by 2030 the state will face a workforce skills gap of close to 1.1 million college educated workers necessary to meet our economic demands (Johnson, Mejia, & Bohn, 2015).

Inadequate Mathematics Preparation

While math under-preparation greatly impacts graduation rates across the CSU system, the problem is particularly pronounced at their broad access campuses (Jackson & Kurlaender, 2014). Two CSUs with the highest math remediation and lowest graduation rates are California State University, Dominguez Hills (CSUDH) and California State University, Los Angeles (CSULA). While the rate of degree completion for all majors is low, math under-preparation compounds the issue for students attempting STEM majors (see Table 1). CSUDH and CSULA are both designated as Hispanic Serving Institutions (HSI), meaning that their enrollment of undergraduate full-time equivalent students is at least one-fourth Hispanic and half or more of these Hispanic students have incomes at or 150% of the poverty line (Li & Carroll, 2007). As such, these two CSUs serve mostly under-represented students (URS) from urban communities in Greater Los Angeles.

Table 1. CSU Fall 2017 Math Readiness and 2011 Cohort Cumulative Graduation Rates for 4, 5, and 6 Years for All Majors and STEM.

| | Math Remediation (Fall 2017) | 4-Year Graduation | 5-Year Graduation | 6-Year Graduation |
|-----------------------|---------------------------------|----------------------|----------------------|----------------------|
| CSUDH (All Majors) | 56.9% | 6.0% | 29.9% | 42.9% |
| STEM Majors | Not available | 3.5% | 27.9% | 39.5% |
| CSULA (All Majors) | 39.8% | 6.5% | 31.3% | 47.1% |
| STEM Majors | Not available | 4.6% | 26.7% | 41.7% |
| CSU-Wide (All Majors) | 25.4% | 19.2% | 47.3% | 59.2% |
| STEM Majors | Not available | 15.2% | 44.8% | 59.1% |

(California State University, 2018a, 2018b)

Similarly, statewide at CCCs, 80% of students arrive underprepared for college-level mathematics with only 40% of them completing their associate degree/certificate and/or transferring to a four-year university within six years. In contrast, of the 20% whom arrive college math ready, 72% complete their degree/certificate or transfer within six years. When the data are disaggregated for low-income and minority students, 92% arrive unprepared with 33% of them completing/transferring within six years (California Community Colleges, 2018; Rodriguez, Cuellar-Mejia, & Johnson, 2018).

Students in rural communities depend particularly heavily on CCCs due to low eligibility rates for four-year universities. For example, in the San Joaquin Valley A-G completion rates¹ are 26% -- compared to 55% for LAUSD and 45% for the State average (Boris, 2018) and only 23% of their students take the SAT (Boris, 2018) -- compared to 49% nationwide and 60% statewide (National Center for Education Statistics, 2015). As a result, most students who decide to pursue a bachelor's degree in the Central Valley first begin at a CCC and then transfer to a 4-year institution.

The college math readiness issue can be tracked back into California's public high schools using data from the California Assessment of Student Performance and Progress (CAASPP)². The CSU uses students' 11th grade scores as an early indicator of college math readiness. The results are presented as scaled scores or in four performance level with the upper levels indicators of college math readiness. Students who score a four on their CAASPP may enroll directly in a college-level math course without the need for placement testing or additional support courses³. The last four years of statewide CAASPP scores, presented in Table 2, illustrates the low rates of college math readiness, specifically for URS.

Table 2. Historical CAASPP College Math Readiness (Level 4) Rates

| CAASPP Level 4 Data | 2015 | | 2016 | | 2017 | | 2018 | |
|---------------------------|---------------|------------------------|---------------|------------------------|---------------|------------------------|---------------|------------------------|
| | # of Juniors* | College Math Ready |
| All Students | 418,491 | 11% (46,034) | 432,383 | 13% (56,210) | 442,457 | 13% (57,519) | 437,883 | 13% (56,433) |
| Race | | | | | | | | |
| African-American | 25,142 | 3% (754) | 25,504 | 3% (765) | 24,604 | 3% (809) | 24,015 | 3% (831) |
| Hispanic | 216,877 | 4% (8,675) | 225,647 | 5% (11,282) | 231,654 | 5% (11,212) | 232,433 | 5% (11,482) |
| White | 107,776 | 17% (18,322) | 109,805 | 18% (19,765) | 108,967 | 19% (20,399) | 104,873 | 19% (19,706) |
| Asian | 38,775 | 40% (15,510) | 40,145 | 43% (17,262) | 44,167 | 44% (19,257) | 42,593 | 44% (18,541) |
| Economic Status | | | | | | | | |
| Low-Income | 229,875 | 5% (11,494) | 248,574 | 6% (14,914) | 247,708 | 6% (14,516) | 252,960 | 6% (15,304) |
| NOT Low-income | 188,616 | 19% (35,837) | 183,809 | 22% (40,438) | 194,749 | 22% (42,670) | 184,923 | 22% (41,164) |

Source: (CAASPP, 2018)

¹ A-G are the minimum requirements necessary to be eligible to apply to the University of California (UC) and CSU systems. <https://www.ucop.edu/agguide/a-g-requirements/index.html>

² <https://www.cde.ca.gov/ta/tg/ca/>

³ http://www.csustudentsuccess.org/mm_math_stem/enroll-in-ge-math-course

In 2010, the state implemented the Common Core State Standards for Mathematics (CCSS-M) across K-12 in an effort to better prepare students for college. Researchers at the Public Policy Institute (PPIC), “found no overall effect on graduation rates, the share of students taking or passing Advanced Placement courses, the share of students taking the SAT exams, or the share completing the “a–g” courses required by California’s four-year public universities.” (Gao & Lafortune, 2019, p. 3).

Lack of a College Plan

High school counselors are the most critical source of college knowledge for students (Belasco, 2013), yet three systemic barriers hinder their ability to help students with the transition into college: (1) school finances, (2) counselor training programs, and (3) competing demands for counselors’ time (Avery, Howell, & Page, 2014). First, high schools have historically not funded counselor positions at adequate levels. The American School Counselor Association (ASCA) recommends a counselor-to-student ratio of 1 to 250. California’s average is triple that with one counselor for every 760 students – with high poverty schools having ratios even higher than that (Clinedinst & Koranteng, 2017). Paradoxically, students with the highest needs meet with their counselors the least amount of time (Avery et al., 2014). Second, most pre-service counselor training programs in this nation do not prepare their candidates with the knowledge and skills to develop, implement, and evaluate college-readiness programs. The majority of university-based school counselor preparation programs focus on teaching prospective school counselors how to provide individual therapy and intervention to students – without explicitly focusing on the key aspects of college counseling. In fact, most pre-service school counselors are typically trained in conjunction with prospective marriage/family and mental health counselors. Even when universities require field practicum experiences, many school counseling candidates satisfy these requirements through individual counseling sessions which often are not required to be in a school setting (Hines & Lemons, 2011). Third, school counselors nationally only spend an average of 21% of their time engaging in postsecondary admission counseling (Clinedinst & Koranteng, 2017). Bruce & Bridgeland (2012) capture their typical workday:

In addition to supporting students’ social-emotional and academic development, counselors provide administrative support, fill in for teachers, coordinate tests, and act as a liaison between schools and communities, among many other responsibilities. Although their efforts do not go unnoticed by administrators, many counselors and administrators alike believe that changes should be made to counselors’ job responsibilities to attain the goal of an education system in which all students graduate from high school ready to succeed in college and career (Bruce & Bridgeland, 2012, p. 12).

The problem is augmented by the lack of professional development for high school counselors on how to effectively help students apply to, enroll in, and transition into college (Bruce & Bridgeland, 2012). In this context, it is clear why most students do not graduate from high school with a coherent strategy to navigate their transition to college graduation. High school seniors are overwhelmed by the numerous and complex choices they must make in a short amount of time (Ross, White, Wright, & Knapp, 2013). This problem is particularly amplified for under-represented students as Denley (2014) explains:

First generation, low-income and minority students often do not have the advice system that surrounds students whose parents or other relatives have been to college. Information is certainly available to these students, but without knowledge of the structure and nomenclature of higher education they are unable to even frame the questions that would enable them to become informed. (Denley, 2014, p. 62).

As a result, one-third of first-generation college students matriculate into college without choosing a major compared to 13% of students from households with familial college knowledge (Chen & Carroll, 2005). Those students who do choose a major, most often do it with limited information on how to successfully complete that program (M. Kirst & Venezia, 2004) or realize too late that their expectations for their area of study are incongruent with the reality of the career options in that field (Smith & Wertlieb, 2005).

CONTEXT

EO1110 & AB705: Policies Transforming the Landscape of College Mathematics

Both the CSU and CCC systems have been undergoing massive transformations in their assessment and placement policies for mathematics. These conversions have been in the works for years with groups of faculty, administrators, and researchers piloting programs, conducting evaluations, and sharing challenges and best practices. The South Los Angeles Math (SLAM) project is one such pilot program that has been discussed, lauded, and criticized in many round-table discussions around the state. Despite the years of conversations, the policy changes seemed sudden.

In November 2017, CSU's Chancellor signed Executive Order (EO) 1110, Assessment of Academic Preparation and Placement in First-Year General Education Written Communication and Mathematics/Quantitative Reasoning Courses⁴. Two major policy changes of this EO that took effect in the fall of 2018 are: 1) eliminating the CSU Math Placement Test (ELM) in lieu of multiple measures, and 2) eliminating pre-requisite remedial courses in lieu of co-requisite support courses. In response to this EO, Cal State LA's math department chair shared that they are basically adopting the SLAM model (Brookfield, 2018). These changes were implemented in Fall 2018.

Following suit, CCC's Chancellor signed AB705⁵ which took effect on January 1, 2018. The bill states that, "The goal of this act is to ensure that students are not placed into remedial courses that may delay or deter their educational progress unless evidence suggests they are highly unlikely to succeed in the college-level course." Much like EO1110, AB705 calls for multiple measures and co-requisite support classes; however, each CCC may implement this policy change as they see fit.

CSU's Multiple Measures of College Readiness

Educators across the state use three acronyms interchangeably: SBAC, CAASPP, and EAP. The Smarter Balanced Assessment Consortium (SBAC)⁶ is the public agency that creates the online Common Core State Standards (CCSS) assessment system for grades 3-8 and 11 used in California's public schools. The 11th grade test is the only one that determines college readiness. The California Assessment of Student Performance and Progress (CAASPP)⁷ system is the state's comprehensive accountability measure; one of its components that applies to most students is

⁴ <https://calstate.policystat.com/policy/6656541/latest/>

⁵ <https://assessment.cccco.edu/ab-705-implementation>

⁶ <http://www.smarterbalanced.org/>

⁷ <https://www.cde.ca.gov/ta/tg/ca/>

the SBAC assessments. Finally, the Early Assessment Program (EAP)⁸ is one of the multiple measures the CSU uses to gauge 11th graders college readiness.

There are three types of multiple measures used by the CSU: (1) standardized tests, (2) Grade Point Average (GPA), and (3) high school and college coursework. The standardized tests currently used include CAASPP/EAP, ACT, SAT, Advanced Placement (AP), International Baccalaureate (IB), and College Level Examination Program (CLEP). GPAs include overall high school and math specifically. High school coursework must include a 12th grade approved year-long math course beyond Algebra 2/Integrated Math 3 (IM3) and for college, the student must earn a grade of C- or better in a college math class satisfying the B4 (math/quantitative reasoning) requirement. Using these quantitative multiple measures, the CSU developed a complex system for placing students into different math courses⁹.

From these there are four possible outcomes: (1) fulfilled requirement, (2) enroll in GE math course, (3) enroll in supported GE math course, or (4) Early Start Program. If students fulfill the requirement, they can either not take any more math classes (non-STEM) or are placed in the next math course appropriate for their major (STEM). Second, if the CSU deems them ready, they are enrolled in a regular credit-bearing college math class. Next, if they have not yet demonstrated college math readiness, students are programmed into a GE math course with embedded support and tend to vary from campus to campus. Finally, students who do not meet the criteria to be in any of the other three groups, are required to take part in the Early Start Program (ESP)¹⁰. The CSU's ESP was developed to support students in becoming college math ready during the summer before the fall term of their first year of college.

CCC's Multiple Measures of College Readiness

Similar to the CSU, the CCC system developed a system that distinguishes if a student is ready to enroll in a college level math course or a college level math class with support. While there are no official system wide placement category titles, the working vernacular used across the state is "transfer level" and "transfer level with support." Transfer level indicates that the course is transferable to a UC or CSU campus and will count towards the completion of a bachelor's degree.

Each CCC campus has the flexibility to roll out this new placement process in the first years of implementation. In a July 2018 memo, the CCC Chancellor's Office provided guidance for campuses when using high school GPA as a placement criterion. At this time, CCCs use weighted overall high school GPA that student self-report on their application for admission¹¹.

Along with this introductory guidance from the CCC Chancellor's Office, campuses are encouraged to engage in research projects at the local level to determine other measures that can be used to aid in accurately placing students in transfer level math courses. The Multiple Measures Assessment Project (MMAP) Research Team (2017) explains the benefits of this approach:

Please note that while every effort has been made to create valid predictive models, improving the college success of former high school students need not be approached as a statistical problem alone. Collaboration among high schools and colleges leading to articulation of course sequences and pathways is highly likely to outperform predictive

⁸ <https://www.cde.ca.gov/ci/gq/hs/eapindex.asp>

⁹ http://www.csustudentsuccess.org/academic_preparation_overview

¹⁰ http://www.csustudentsuccess.org/earlystart_overview

¹¹ <https://assessmentplacement.squarespace.com/s/0718-AB-705-Implementation-Memorandumpdf.pdf>

analytics in increasing success and throughput rates for our students.”(MMAP Research Team, 2017, p. 3)

COVID 19

K-12 schools throughout California closed abruptly on Friday, March 13, 2020 due to COVID-19 pandemic. The Los Angeles Unified School District was one of the first district to officially announce the closure. Their announcement came a day earlier, providing teachers and students the opportunity to pack up their belongings on Friday. Most of the remaining school districts in the state held emergency board meetings that Friday with the closure announcements coming that evening. For those students and teachers, their belongings remained locked in the schools. Districts initially announced closures spanning one-two weeks with a few districts extending through the upcoming spring break. California's Southern and Central Valley were the hardest hit by COVID-19, closing all public schools through the remainder of the year.

The school districts' initial response was an intense focus to provide student meals. Administrators and faculty halted most academic programs to safely provide breakfast and lunch to all students, regardless of income level. Once it became clear that schools would not reopen in the foreseeable future, plans were developed and executed to provide a device (laptop or tablet) and internet access to all students.

During this time K-12 teachers were asked to halt instruction as not to create inequitable experiences for students with or without access via technology and internet. One small M-PRéP district in the Central Valley provided packets of work for all students to pick up. This district held students accountable for completing their work with extended time to do so. The remaining districts employed a “Do No Harm” policy where students were not required to attend any class nor complete any work and could not be given a failing grade. Within this mandate, many teachers continued supporting students in any way possible.

College campuses across the county began closing in early March. By mid-March every CSU, UC and CCC campus in California closed with little to no warning. The timing of the closures was somewhat manageable as it was very close to already scheduled spring breaks. Many campuses announced an “extended” spring break hoping to return to campus in April. As our state, nation and world began to experience the full impact of COVID-19, the California college systems announced that not only would the remainder of the Spring semester be held online, but also the upcoming summer sessions. Similar to the experience of K-12 staff, college staff scrambled to make accommodations at varying levels of success.

Within a month of the school closures, College Bridge shifted the M-PRéP research project to study the impact of COVID-19 on college matriculation and retention. This report will show the initial findings of our research and will be continued in next years' report.

Our research suggests that college campus closures impacted students in various ways. Continuing college students had to manage transitioning to all online courses while having little to no access to the support services had access to on campus.

Additionally, COVID-19 impacted the upcoming high school graduating Class of 2020. COVID hit at the time of year when students were receiving college admission decisions, along with financial aid offers. Many high school students had to make an important life decision with inadequate access to counselors at both the high school and college level. Initial reports from colleges indicate a drop in enrollments for the Fall 2020 term (*source: Highschool Benchmarks for*

2020, *National Student Clearinghouse*). Next years' report will examine in greater detail the effects of COVID-19 on the SLAM graduating class of 2020.

THE PROJECT

The Math Pipeline Readiness Project (M-PReP) was designed to increase college graduation rates by (1) improving math readiness rates through the vertical alignment of high school math courses from grade 9 – college and (2) supporting high school seniors in the development of a college transition plan (CTP). All work is predicated upon Communities of Practice (CoP) comprised of K-12 math teachers or counselors working in collaboration with their higher education counterparts to develop, implement, evaluate, and revise innovative, outcome-based programs.

Math Readiness Communities of Practice (CoPs)

Two types of CoPs were developed to address the math readiness dilemma: (1) math departments working to vertically align their grades 9-11 math programs to college rigor, and (2) math teacher/professor teams providing dual-credit Statistics and Pre-Calculus courses on the high school campus. The dual-credit courses allow the high school math department to align their grade 9-11 courses to their local CSU or CCC mathematics program.

Math Department CoPs

Since the CAASPP scores measure students' proficiency of the CCSS-M, the primary focus of the math departments is to improve instruction on this assessment. The M-PReP seeks an annual increase of 15 percentage points in the rate of students meeting or exceeding standards annually. The math departments engage in Professional Development (PD) to align their math programs, create common assessments, analyze student data, create interventions, and evaluate their efforts. The alignment of grades 9-11 establishes the alignment to the dual-credit courses. The M-PReP supports a teacher at each site to serve as a Math Lead who works with the M-PReP Math Specialist to plan, implement, and evaluate the PD. The Math Lead also connects the work of the dual-credit CoPs to their entire math department.

Dual-Credit (SLAM) CoPs

The M-PReP includes three dual-credit CoPs: (1) CSU Statistics, (2) CSU Pre-Calculus, and (3) CCC Statistics. The CSU Statistics program, which began in 2013, originally known as the SLAM Project; the CSU Pre-Calculus program launched in 2017. Despite extending beyond South Los Angeles, the programs are widely known as SLAM Statistics and SLAM Pre-Calculus. The rural version launched with a CCC Statistics program in the fall of 2018.

Unlike most dual-credit courses, SLAM is an intervention for CSU-bound students who have not demonstrated college math readiness prior to 12th grade. The dual-credit courses are co-taught by a college professor and high school teacher with the former focusing on the college content and the latter providing additional support in pre-requisite content. The courses are stretched to a high school calendar to allow ample time for the support teacher to provide intervention. The courses are offered on the high school campus during the regular school day to integrate into the high school curricula.

The unique focus on under-prepared high school students is two-fold. First, it allows high school teachers to learn the areas of growth their students have that need to be strengthened into the grade 9-11 courses. It also allows students who were not college math ready to earn college

credit and continue in the math sequence in college without the need for support classes or summer programs.

The SLAM Statistics course was designed for students who do not plan to pursue STEM degrees; the SLAM Pre-Calculus program was designed for STEM-bound students. The latter seeks to improve outcomes in Calculus and improve the rate of students earning STEM degrees.

College Counseling CoP

The fourth category of CoP is composed of the M-PReP College Counseling Specialist, high school counseling leads from each site, and college advisors from each CSU. The team focuses on supporting students' development of a College Transition Plan (CTP) and tracking their progress through graduation. The M-PReP Counseling Specialist facilitates PD with the CoP while building capacity within each site to institutionalize the program. After 12th grade, when students transition to institutions of higher education, the work will be handed off to the postsecondary partners. The students will participate in orientation and summer bridge programs (as available and appropriate) to fine-tune their college plans.

Teacher participation in CTP implementation and professional development activities contributed to their students' progress toward college graduation.

THEORETICAL FRAMEWORKS

M-PReP builds upon two theoretical frameworks: Academic Disjuncture Theory and College Readiness Indicator Systems (CRIS)¹². Academic Disjuncture Theory postulates that the overarching barrier to college access and success is "the deeply-embedded chasm that separates K–12 from postsecondary education in the United States" (M. W. Kirst & Usdan, 2009, p. 5). These theorists contend that a seamless educational pipeline between K-12 schools and higher education is key to the unfettered progress of students between educational segments. Currently the systemic disconnections are most pronounced in the areas of curricula, assessments, financial processes, data systems, and accountability (Brown & Niemi, 2007; Domina & Ruzek, 2012; Kurlaender, Jackson, & Howell, 2012). M-PReP attempts to fuse K-12 and higher education together by bringing high school teachers and college professors to work collaboratively to decrease the high rates of mathematics remediation.

The College Readiness Indicator Systems (CRIS) are valid, reliable, and actionable indicators of three dimensions of college readiness: academic preparedness, academic tenacity, and college knowledge (Borsato, Nagaoka, & Foley, 2013; College Readiness Indicator Systems, 2014). This study is predicated upon the activities, resources, processes, and outcomes at the individual (student), setting (school), and systemic (inter-segmental partners) levels. Academic preparedness includes content knowledge and skills as well as cognitive strategies instrumental to succeed in credit bearing courses in college. Academic tenacity encompasses the underlying beliefs, attitudes, and values that drive student achievement coupled with behaviors of active participation and perseverance. College knowledge embodies the information, skills, and behaviors that foster college access and success. On an individual level, we gauge M-PReP students' personal development toward college readiness through their dual-credit pass rates, study skills, persistence, expectations for future, and college knowledge. Similarly, on a contextual level, we investigate M-PReP's instructional coherence and rigor. Systemically, we

¹² <https://consortium.uchicago.edu/publications/college-readiness-indicator-systems-resource-series>

delineate the best practices for increasing college access and success for under-represented students from both urban and rural communities.

College readiness was also explored as an overarching construct, extending beyond course grades and exam scores. There is widespread discussion in the literature about college readiness, or students' ability to succeed in college based on academic preparation as well as other cognitive, attitudinal, and behavioral factors believed to be necessary for successful post-secondary transition and completion. To better understand college readiness and its many intersecting facets, various frameworks have been developed which have been used to further its study and impact (Borsato, Nagaoka, & Folley, 2013; Conley, 2007). These have been particularly useful in studying barriers to college completion among traditionally under-represented students as studies have shown that gaps in college readiness skills jeopardize college completion for these populations (Ramsey-White, 2012).

EVALUATION

Evaluation Design

The evaluation of M-PReP is a multi-year effort in alignment with its program delivery. The evaluation design incorporates a mixed-methods longitudinal approach for two overarching purposes: (1) formative, to inform the program and promote continuous quality improvement of services and support to schools, teachers, and students; and (2) summative, to determine the effectiveness of M-PReP in achieving its intended outcomes and learn best practices for increasing college access and success for under-represented students from urban and rural school districts. The mixed-methods approach in evaluation allows for a comprehensive study into the "what" (quantitative) and the "how and why" (qualitative) factors that influence success for these specific populations. Further, a longitudinal approach is the most appropriate in tracking student outcomes from high school through college, to assess college readiness, persistence, and completion.

Evaluation Questions

1. In what ways does participation in M-PReP impact:
 - a. students' college math readiness?
 - b. performance on SBAC? (cannot be answered due to COVID testing cancellation)
 - c. students' knowledge of fundamental mathematical concepts? (cannot be answered due to COVID testing cancellation)
 - d. earned college credit in math (pre-calculus, calculus, statistics)?
 - e. college matriculation?
 - f. college retention?
 - g. college completion?
2. What key successes and challenges, if any, did partner sites experience with M-PReP?

FINDINGS

Research Question 1.a. In what ways does participation in M-PReP impact students' college math readiness?

- Based on CSU Math Placement Metrics.
- Based on CCC Math Placement Metrics.
- Compared to the CDE's College and Career Readiness Metrics.

39% of Students were CSU Math Ready and 47% were Ready for CCC Mathematics.

The term “college math readiness” has different definitions within each sector of public education across California. For graduating high school seniors, the California Department of Education (CDE) developed a complex matrix of multiple measures to broadly define “College and Career Readiness” (see appendix X) called the College and Career Indicator (CCI). The state does not specifically address college math readiness. In higher education, the California Community Colleges (CCC) and California State University (CSU) systems recently redefined math readiness through system-wide policy changes (See appendix X, and Y, respectively). Similarly to the CDE, the higher education systems utilize multiple measures to define college readiness. Unlike the CDE, the CCC and CSU use the measures for placement in math courses with different metrics used for students pursuing STEM and non-STEM majors.

The multiple and competing definitions of college readiness make it difficult to determine how best to prepare students for higher education. In a vernacular twist, higher education abandoned terms such as “college ready” and “prepared” along with the policy changes used for placement in college-level math and English courses. Whereas historically students who required remediation were deemed “not ready” or “unprepared,” now all students are deemed “ready” but still may require additional support classes. During the same time frame that higher education changed their policies, the CDE launched the College and Career Readiness Indicator using levels such as “prepared” and “not prepared.”

College Bridge fuses this gap using the following definition:

A student is academically prepared for college if he/she is eligible to be placed in college-level courses without the need for additional support.

The M-PRéP project measures college math readiness for all graduating seniors based on both the CSU and CCC criteria to provide schools with college math readiness data. Given the complexities of the metrics and the available data from school districts, the reporting only uses the non-STEM bound criteria.

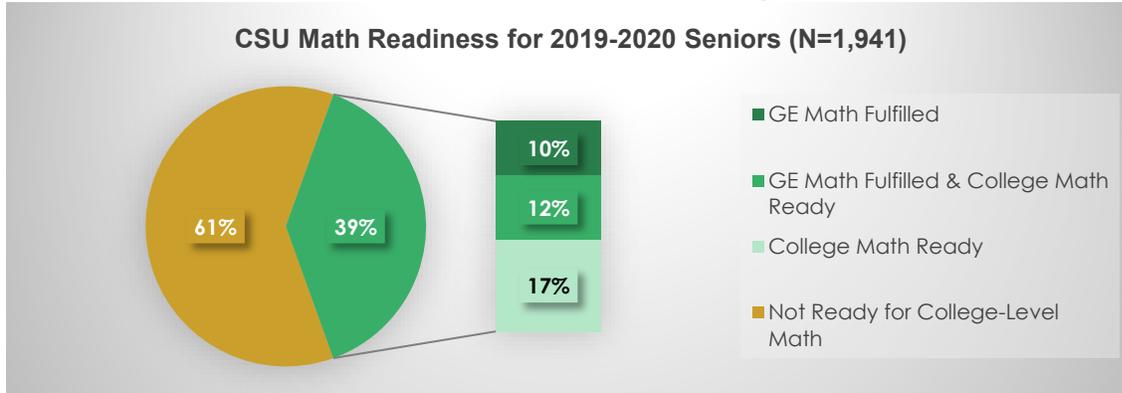
College Math Readiness based on CSU Math Placement Metrics. The data provided below were provided by M-PRéP’s five partner school districts at the end of students’ senior year of high school. Since it is unknown which college major students will ultimately pursue, the CSU’s metrics for non-STEM majors are used. In this report the CSU’s four math placement levels are collapsed into the following three levels:

- **Fulfilled:** Students earned college math credit in high school either by passing a college-level math course or scoring a 3 or higher on an AP Math exam, thus fulfilling their CSU General Education Math Requirement.
- **Ready:** Students are eligible to place directly in college-level math courses without enrolling in additional support classes.
- **Not Ready:** Students are required to enroll in math support classes in addition to college-level math courses.

Overall, 39% of students from M-PRéP schools graduated high school either college math Ready or Fulfilled, whereas 61% of students required additional support classes in mathematics (see Table 3). In the table, shades of green are used to show the relationship between Fulfilled and

Ready levels with the shade in the middle representing an overlap for students who satisfy the criteria for both categories.

Table 3. CSU Math Placement Levels, Conflated, for all M-PRéP High School Students, Class of 2020



Moving students into the lightest green region of the chart (College Math Ready) is a goal of M-PRéP that should be achieved by the end of the junior year given that this is when students should complete their high school mathematics program. The senior year of high school should be used for either (1) higher mathematics studies such as college courses or Advanced Placement, or (2) intervention to help students become college math ready.

M-PRéP provides a senior year, college-level math class with support (aka SLAM classes), in either college Statistics or Pre-Calculus, as an intervention for students who are not deemed college math ready by the end of their junior year. The former is intended for students who do not intend to pursue STEM majors in college and the latter is for STEM-bound students. Passing either course with a grade of C or higher moves students into the General Education (GE) Math Fulfilled category and may also move them into the College Math Ready category. It is possible to be Fulfilled and still not satisfy the metrics for Ready.

Overall, 22% (N =1,941) of M-PRéP seniors placed in the CSU's Fulfilled category with most doing so through SLAM courses (passing a math AP exam with a score of 3 or higher also meets the Fulfilled requirement but only 1% of students met the requirement in this manner). An important distinction should be made between the College GE Math Fulfilled (dark green) and GE College Math Fulfilled & College Math Ready (green) categories. The 10% of students in the Fulfilled category had not been deemed Ready at the end of their junior year and had no mechanism other than passing a college course or scoring a 3 or higher on an AP math exam to get ready. The other 12% were tentatively ready, through test scores (state exam, SAT, ACT) or math course grades and needed to pass an optional fourth-year math course to become college-math ready. Most of these students utilized SLAM courses to satisfy their fourth year of math requirement.

Table 4. Breakdown of CSU College Ready or Fulfilled for M-PRéP Senior Class of 2020

| | School D N=332 | School E N=411 | School A N=388 | School N N=128 | School G N=239 | School F N=443 | Total N=1941 |
|-------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----------------|
| Percent Ready | 20% | 22% | 14% | 0% | 32% | 12% | 17% |
| Ready & Fulfilled | 9% | 11% | 10% | 63% | 0% | 11% | 12% |
| Percent Fulfilled | 3% | 2% | 18% | 0% | 0% | 8% | 10% |
| Sum Ready or Fulfilled | 32% | 36% | 42% | 63% | 32% | 31% | 39% |

According to the data in Table 4, School A utilized the SLAM class to the fullest with 18% of students Fulfilling the CSU requirement who did not have another viable path to becoming College Math Ready in their senior year. Although School N had the highest rate of CSU Readiness or Fulfillment, all of their students could have become College Math Ready by passing a fourth year of mathematics and did not require the SLAM project. School G did not have a viable SLAM project yet prepared 32% of their seniors for CSU college-level mathematics without the need for additional support.

[College Math Readiness based on CCC Math Placement Metrics.](#) The CCC readiness criteria presented in this report only utilized the metric for non-STEM students, requiring a weighted GPA of 3.0 or above. Of the 1,941 M-PRéP seniors, 47% met this requirement. Table 5 provides a site level and aggregate comparison of CSU and CCC college math readiness.

Table 5. Comparison of CSU and CCC College Math Readiness, Class of 2020

| | School D N=332 | School E N=411 | School A N=388 | School N N=128 | School G N=239 | School F N=443 | Total N=1941 |
|-------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----------------|
| CSU Ready or Fulfilled | 32% | 36% | 42% | 63% | 32% | 31% | 39% |
| CCC Ready | 39% | 51% | 43% | 69% | 49% | 47% | 47% |

As in the CSU levels, overlap also exists within the CCC and CSU readiness metrics. Overall, 30% of students (N=1,941) qualified as college math ready for both the CCC and CSU systems. An additional 18% (N=1,941) of unique students qualified as ready for the CCC system but not the CSU system.

[Higher Education Placement compared to the CDE’s College and Career Readiness Metrics.](#)

Although the CDE's College and Career Readiness Indicator (CCI) does not specifically address preparation for college-level academics, the system does provide a percentage of high school seniors who are deemed “prepared.” For comparison, those data are provided in table 6.

Table 6: Comparison of CSU and CCC College Math Readiness with CDE CCI percentage, Class of 2020

| | School D N=332 | School E N=411 | School A N=388 | School N N=128 | School G N=239 | School F N=443 | Total N=1,941 |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|
| CSU Ready or Fulfilled | 32% | 36% | 42% | 63% | 32% | 31% | 39% |
| CCC Ready | 39% | 51% | 43% | 69% | 49% | 47% | 47% |
| CDE College & Career Ready* | 42.7% (N=405)* | 54.5% (N=442)* | 43.9% (N=449)* | 64.9% (N=131)* | 61.4% (N=246)* | 81.2% (N=442)* | 57% |

* Publicly available data from CA School Dashboard uses all student data whereas the CCC and CSU readiness calculations use data provided by school districts for students who have CAASPP scores. Different population sizes are noted in the table. <https://www6.cde.ca.gov/californiamodel/>

The scope of this report does not include thorough discussion of the similarities and differences between the CCI and the higher education metrics for student placement in mathematics. That said, we will provide two distinctions. First, Schools G and F have robust Career Technical Education (CTE) programs that include numerous opportunities for dual-enrollment courses. Both schools CCI percentage is heavily weighted by those programs. Second, through M-PRReP we have learned that some schools are not reporting all CCI data correctly to the state. This results in percentages on the CA School Dashboard that are lower than the actual outcomes. For example, School A codes their SLAM dual-enrollment courses as high school A-G courses in student data systems thus suppressing these data from the CCI calculation on the CA School Dashboard. The M-PRReP is working with all partner sites to ensure that the data submitted for the CA School Dashboard are accurate.

Research Question 1.d. In what ways does participation in M-PRReP impact students' earned college credit in math (pre-calculus, calculus, statistics)?

83% of SLAM earned college credit in mathematics.

Of the high school graduating classes of 2018, 2019, and 2020, a total of 1,103 students with 83% passing a college-level math class with a grade of C- or higher. Eighty percent earned college credit through the SLAM program with the overall rate ticking up to 83% when post-SLAM college math courses are included. Only the SLAM students from the high school graduating classes of 2018 and 2019 (N=637) have had the opportunity to attend at least one year of college; the rate will likely be higher once the class of 2020 is included. Of the students who took at least one year of college, 142 completed a math class with 70% passing.

Whereas the original version of the SLAM program only included a Statistics course, M-PRReP added a Pre-Calculus course designed to improve outcomes for STEM majors. In M-PRReP, SLAM students had an opportunity to choose Statistics or Pre-Calculus based on their interest pursuing STEM or non-STEM majors in college. One unexpected finding is that passing either SLAM course resulted in similar pass rates of college mathematics, including STEM courses (such as College Algebra, Pre-Calculus, and Calculus). Table 7 illustrates these findings.

Table 7: Comparison of College Math Pass Rates by SLAM Course

| | College Math (any) | | College Math (STEM) | | STEM rate |
|---------------------------------|--------------------|-----------|---------------------|-----------|-----------|
| | # of Students | Pass Rate | # of Students | Pass Rate | |
| Passed SLAM All Courses (N=458) | 93 | 75% | 57 | 63% | |
| Passed SLAM Stats (N=294) | 59 | 76% | 35 | 63% | 59% |
| Passed SLAM PC (N=164) | 34 | 74% | 22 | 64% | 65% |

Since the inception of the SLAM program seven years ago, students have consistently reported that the experience of taking a college class had numerous impacts. In an earlier research project on three years of implementation, 83% (N=169) of students reported that their self-perception of college readiness changed. "There were two types of perceptual changes: (1)

those who thought they were ready but realized the class was more difficult than anticipated and, in hindsight, realized they were not ready prior to the class, and (2) those who changed from feeling not ready to feeling ready” (Cevallos & Cevallos, 2017), Students cited better college preparation in areas such as study skills, time management, communicating with professors, seeking support at the first sign of struggle, and forming study groups. Survey data on the SLAM project was collected for a total of eight years with students consistently citing the “experience” as an important preparation for college. The researchers did not cite a single instance of a student reporting any specific math content that helped them better prepare for college-level math courses. While it is not possible to determine causation, this finding does invite an area for future research.

Another area of interest to the research team was the rate of students taking STEM pathways in college. While the rate of students who took SLAM Pre-Calculus choosing a STEM pathway is six percentage points higher than students who took SLAM Statistics, the fact that 59% of the latter pursuing STEM is notable. The students who took SLAM Statistics were advised only to do so if they do not intend to pursue STEM majors in college. While we do not know why they changed their minds, the rate invites yet another area for future research.

Research Question 1.e. In what ways does participation in M-PreP impact college matriculation?

97% of SLAM students attended college immediately after high school graduation.

In spring 2019, 425 SLAM students graduated from their respective high schools. Through available data retrieved from the National Student Clearinghouse and reviews of transcripts provided by students, verifiable college matriculation data were available for 317 students. Of those, 97% (n =307) were matriculated into college during the 2019-20 school year to 52 college campuses. Table 8 shows the college enrollment patterns for the class of 2019.

Table 8. Fall 2019 College System Enrollment Summary

| | Students with data* | UC Enrolls | CSU Enrolls | CCC Enrolls | Private/Out-of-State Enrolls |
|--------------------|---------------------|------------|-------------|-------------|------------------------------|
| SLAM Class of 2019 | n = 307 | 51 (17%) | 131 (43%) | 108 (35%) | 17 (6%) |

*425 students were in the SLAM class of 2019 but only 307 have verified matriculation data.

Nearly half of the students attending college chose to enroll at a California State University campus which matches the intention of the SLAM program in having students earn CSU General Education credits for section B4 Mathematics/Quantitative Reasoning. Additionally, over one-third of the students enrolling in a CSU chose CSU Los Angeles or CSU Dominguez Hills, again matching the intention of the SLAM program serving as a feeder pathway for these two partner universities. One additional CSU campus which stands out this year is CSU Fresno. Nearly 10% of CSU enrollments went to Fresno, reflecting our expansion of M-PreP into the San Joaquin Valley area (Tulare County).

The most enrolled UC campus was UC Merced, with 13 students choosing to attend. The most enrolled CCC campuses included Citrus College, Santa Monica College, Mt. San Antonio College, and Reedley College. Other out of state and private colleges included Dartmouth, University of Iowa, Claremont College, and University of the Pacific.

Table 9. SLAM Alumni College Enrollments (HS Classes of 2018,2019,2020)

| SLAM Alumni (2018-2020) | SLAM Enrolls at UC | SLAM Enrolls at CSU | SLAM Enrolls at CCC | SLAM Enrolls at Private/Out-of- State |
|----------------------------|-----------------------|------------------------|------------------------|---|
| N = 1,013 | 117 (12%) | 340 (34%) | 423 (42%) | 91 (9%) |

For comparison, Table 9 provides aggregate data for all SLAM students from the high school graduating classes of 2018, 2019, and 2020.

M-PRReP Impact on CSU Matriculation. Sites are experiencing yearly ups and downs with number of applications to the CSU system. This is expected due to the relative eligibility of students for each graduating senior class. For context, the CSU is looking to admit the top third of high school graduates so sites should aim for a 33% application rate. Five of the eight of the M-PRReP sites are meeting or exceeding this rate (see Table 10).

Table 10. Site CSU Applications, Admits, & Enrollments (2018,2019,2020)

| Site | Total Seniors | # of CSU Apps | % Senior App | # of CSU Admits | % Senior Admits | # of CSU Enrolls | % Senior Enrolls |
|-----------|---------------|---------------|--------------|-----------------|-----------------|------------------|------------------|
| School A | 1,077 | 840 | 78% | 585 | 70% | 265 | 25% |
| School B | 341 | 305 | 89% | 241 | 79% | 119 | 49% |
| School C* | 263 | 47 | 18% | 33 | 70% | 10 | 30% |
| School D | 1,266 | 345 | 27% | 294 | 85% | 103 | 8% |
| School E | 1,310 | 520 | 40% | 445 | 86% | 171 | 13% |
| School F | 1,262 | 322 | 25% | 248 | 77% | 143 | 11% |

*Data for School C is incomplete on the CSU enrollment dashboard, therefore only confirmed data are presented here.

*SOURCE: <http://asd.calstate.edu/dashboard/enrollment-live.html>

Sites should target an Application to Admit rate of 85% or higher. As illustrated in Table 10, two sites are above 80% and four sites are below 80%. This indicates that both counselors and students need additional guidance on choosing which campuses to apply to ensure the best likelihood for admission.

Admit to Enrollment rates will always vary due to student personal circumstances. A low enrollment rate is not necessarily bad. The best-case scenario is that a student who is admitted to a CSU but chooses not to enroll has simply decided to attend an alternate institution.

M-PRReP Impact on UC Matriculation. While M-PRReP does not focus on college readiness at the UC level, 12% (N = 1,013) of SLAM students have enrolled across UC campuses. The main contributor to these UC enrollments is School N. This site is a small charter school in a large urban district. As a small school they are not able to offer as many senior year math course choices as large comprehensive high schools; therefore, most of their 12th grade students participate in the SLAM program. We have found that for this site, the SLAM program benefits all students, not just those needing a boost in math preparation.

M-PReP Impact on CCC Matriculation. In our Year 2 Evaluation Report, it was noted that both inconsistent and incorrect information about college and financial aid were delivered to students by both teachers and counselors. Messaging varied across sites with some high schools encouraging students to pursue the most competitive universities possible whereas others routed students to community college, believing that was the only option their students could afford. Specifically, Schools D and E saw excessive rates of SLAM students electing to enroll in community colleges, despite being admitted to CSU and/or UC campuses. In response, updated financial aid training and cost of attendance information was provided to teachers, counselors, administrators, and students. Table 11 provides updated enrollment information for both sites.

Table 11. SLAM College Enrollments for School D & E

| | | UC | CSU | Community College | Private College/Univ. |
|-----------------|---------------|---------|----------|-------------------|-----------------------|
| School D | 2019 (N = 54) | 9 (17%) | 6 (11%) | 22 (41%) | 8 (15%) |
| | 2020 (N = 51) | 1 (2%) | 13 (25%) | 28 (55%) | 3 (6%) |
| School E | 2019 (N = 71) | 3 (4%) | 31 (44%) | 28 (39%) | 3 (4%) |
| | 2020 (N= 75) | 8 (11%) | 22 (29%) | 23 (31%) | 7 (9%) |

School D had success routing more students to the CSU but more than half of SLAM students last year enrolled in Community College. School E routed more SLAM students to UC and Private Colleges, as well as slightly lowering their percentage in students enrolling in Community College.

Research Question 1.f. In what ways does participation in M-PReP impact college retention?

SLAM students meet or exceed state college retention rates.

College students who participated in the SLAM program are showing tremendous success in college matriculation and enrollment retention rates, which indicate progress towards graduation. Overall, SLAM students from both 2017 and 2018 are exceeding retention rates at the California State University. The CSU 2nd Year for Continuation Rate the 2017 cohort is 73.8% and the rate for the 2018 cohort is 75.5%¹³. Overall, SLAM student cohort Year 2 retention rates are 88% and 83% respectively, as shown in Table 12 below. While not all SLAM students attended a CSU, the overall retention rates are still on par with the other state college systems. The 2nd year retention rate for the University of California is 90%¹⁴ and is 88% for the California Community College System¹⁵.

¹³ <http://asd.calstate.edu/dashboard/graduation-success.html>

¹⁴ <https://www.universityofcalifornia.edu/infocenter/ug-outcomes>

¹⁵ https://datamart.cccco.edu/Outcomes/Course_Ret_Success.aspx

Table 12. SLAM Cohort College Retention Rates

| Students with available data | | Year 1 Attended College | Year 2 Return Rate | Year 3 Return Rate |
|------------------------------|---------|----------------------------|-----------------------|-----------------------|
| SLAM Class of 2017 | N = 145 | 95% (138) | 88% (122) | 84% (116) |
| SLAM Class of 2018 | N = 208 | 95% (198) | 83% (164) | |

SLAM cohort retention rates were determined using the following confirmed data numbers:

- In spring 2017, 177 SLAM students graduated from their respective high schools. Through available data retrieved from the National Student Clearinghouse and reviews of transcripts provided by students, verifiable college matriculation data were available for 138 students. A total of 7 students self-reported that they were not attending college. Data was not available for the remaining 32 students.
- In spring 2018, 247 SLAM students graduated from their respective high schools. Through available data retrieved from the National Student Clearinghouse and reviews of transcripts provided by students, verifiable college matriculation data were available for 198 students. A total of 10 students self-reported that they were not attending college. Data was not available for the remaining 39 students.

Impact of COVID-19

SLAM students persisted though campus closures in Spring 2020

At the end of the Spring 2020 semester all SLAM alumni were surveyed to explore the impact of the COVID environment on student learning and progress towards degree. It was extremely difficult to reach students during this time, but the information we did collect is presented in Table 13 below.

Table 13. College classes dropped Spring 2020.

| SLAM Alumni (2017,2018,2019) | Dropped all classes | Dropped some classes | Did not drop any classes |
|---------------------------------|------------------------|-------------------------|-----------------------------|
| N = 257 | 7% | 15% | 78% |

Of the 257 students who responded, most (78%) stayed enrolled throughout the Spring semester, with 22% of students dropping one or more classes at the onset of COVID. To further understand the issue, Table 14 describes COVID related reasons why students dropped classes.

Table 14. Reasons for dropping classes Spring 2020 (All Student Responses, N=56)

| SLAM Alumni (2017,2018,2019) | N = 56 | Reason |
|--|--------|--------|
| Family or personal issues | 28 | 50% |
| Did not want to take classes online | 19 | 34% |
| Needed to work | 18 | 32% |
| Limited or no access to support services | 14 | 25% |
| Other | 8 | 15% |
| Limited or no access to technology | 8 | 14% |
| Had to move back home | 7 | 13% |
| Class(es) was dropped by college | 4 | 7% |

Note: Students were able to select multiple options so total may be greater than 100%.

The top reason for students dropping classes was family or personal issues. One third of students indicated that they did not want to take their classes online. Comments from students included:

“My family struggled so much, most of my family including my dad and mom tested positive for COVID-19 and my dad was sent to the emergency room,” and “Had to help my family out and start work so I dropped out of school.”

Another item listed in Table 14 above is limited or no access to support services.

As second- and third-year college students, SLAM students may feel more confident and acclimated to college, but still are in need of support services. Table 15 below shows that at the beginning of the Spring 2020 semester most students were utilizing multiple academic support services and college resources. The COVID campus closures came in late March, about halfway through the semester. Most SLAM students persisted to find a way to access services needed, but usage did decline. Academic Support Services declined by 12% or higher in all categories, the largest being a 20% decline in the utilization of study groups.

Table. 15 Impact of COVID-19 Closures on College Academic Support Services During Spring 2020 on SLAM Alumni, Class of 2017, 2018, 2019 (All Student Responses, N=205)

| Academic Support Service | Pre COVID, % Using Service | After Closure, % Using Service | After Closure % Needed, but inaccessible | Decline in usage after COVID School Closure |
|--------------------------|----------------------------|--------------------------------|--|---|
| Professor Office Hours | 81% | 69% | 8% | -12% |
| Tutoring | 66% | 48% | 16% | -18% |
| Study Groups | 76% | 56% | 15% | -20% |
| Academic Advising | 87% | 68% | 12% | -19% |

Beyond academic support services, students also missed the social support services college campuses provide. Table 16 below shows that College Resources usage declined by 12% or higher in each category, the largest being an 18% decline in accessing Career Center services.

Table. 16 Impact of COVID-19 Closures on College Resources During Spring 2020 on SLAM Alumni, Class of 2017, 2018, 2019 (All Student Responses, N=252)

| Academic Support Service | Pre COVID, % Using Service | After Closure, % Using Service | After Closure % Needed, but inaccessible | Decline in usage after COVID School Closure |
|--------------------------|----------------------------|--------------------------------|--|---|
| Student Clubs/Orgs | 62% | 50% | 8% | -12% |
| Career Center | 71% | 53% | 8% | -18% |
| Student Health Center | 65% | 49% | 8% | -16% |

The data tables above indicate that 8% of students wanted or needed access to services that were no longer available or easily accessible. Nearly 20% of students needed academic support in the form of professor office hours, tutoring, or study groups, but were unable to access it in a distance format. Nearly 16% of students would have utilized the campus Health Center if it had been open. Even if services were open, not all students could use the service they had paid for. As one student commented, *“the health center was technically accessible, but they've made it very very difficult and costly to actually get an appointment.”*

Research Question 1.g. In what ways does participation in M-PReP impact college graduation?

Depending on major and college of attendance, college graduation generally requires 120 semester units. Using individual student transcripts and National Student Clearinghouse data, we have been able to confirm the number of units and/or class level standing for 216 SLAM alumni from 2017 and 2018 cohorts. Two-thirds of the 2018 cohort have completed two years of college and are on track to graduate in four years. After three years of college, more than 80% of the 2017 cohort is on track to graduation, split almost evenly between a four- and five-year track. Students who are still at the freshman level may be taking time off, attending college part time, or experiencing other delays in completing college units.

Table 17. SLAM Students on track towards college graduation

| HS Grad Year | Cohort Size | Students with Data | Still Freshmen | On Track 4Yr Grad | On Track 5Yr Grad |
|--------------|-------------|--------------------|----------------|-------------------|-------------------|
| 2018 | 247 | N = 126 | 33% | 67% | n/a |
| 2017 | 177 | N = 90 | 10% | 44% | 46% |

M-PReP's first college graduates. A total of ten M-PReP students who participated in SLAM have graduated from college. Nine have graduated from a California Community College, including the following campuses: LA Trade Tech, El Camino College, and Reedley College. One student completed their bachelor's degree in Spring 2020 from South Texas College.

Research Q2. What key successes and challenges, if any, did partner sites experience with M-PReP?

Challenge: Accessing Data for Data-Driven Decision Making. Throughout the last three years of M-PReP, one of the biggest challenges is data collection. Districts want their staff to use data to set goals and drive instruction, but the data are difficult to obtain. The quantitative school data used in this report, for example, took five months to collect with multiple requests to each district

when data were incomplete or incorrect. Over the years we learned about the following challenges that sites experience with data collection:

- Teachers often cannot access data they need to set goals and improve student outcomes.
- There is limited knowledge at districts about the state's new accountability measure for College and Career Readiness.
- Data are housed across multiple platforms in a school district with different people having access to different pieces of the data picture.
- Once students graduate, their data are moved to external "stored" areas.
- The people who assist with data collection are generally not involved in academic programs and may not know how data are used.
- K-12 districts generally do not have dedicated Institutional Research personnel.
- Data from College Board (AP, SAT) is rarely integrated into district data systems.

At the instructional level, we observed that sites that have a dedicated math coach or math intervention coordinator fare better in terms of access to data. These professionals are tasked with improving outcomes and, as such, obtain data that teachers need to set goals and address student needs. We recommend such a position for all sites. In addition, we recommend that the math coaches learn the metrics for college math readiness and are provided access to those data as well. Then they can help set student goals for beyond high school completion.

[Success: M-PRReP Allowed College Bridge to Seamlessly Support Teachers and Counselors through the School Closures.](#) Counseling: When schools closed due to COVID-19, K-12 staff were taxed with challenges on every front, including how to guide 12th grade students through the college application process. There were many K-12 and higher education policy changes that affected college eligibility for the Class of 2020 & 2021. College Bridge designed and implemented a robust online professional development curriculum for counselors on policy changes, how to best assist students, and opportunities to collaborate with counselors from other sites. There were multiple events each week, ranging from 45-minute webinars to 2-hour in depth workshops. All options were open to M-PRReP partners, along with opportunities for partner sites to schedule additional exclusive sessions.

What we continued to see from sites was a variety of visions and approaches as to the role of the counselor team. One M-PRReP site took advantage of the additional PD provided, participating as a full team to prepare for the upcoming college application season. The counselors addressed multiple topics, problem solving in real time to determine how to best communicate and provide services to their students. Other sites, however, hesitated to participate as a unified team, with only some counselors self-selecting to participate individually in one or more shorter, broad based PD events. While it would have been preferred for more sites to attend full team sessions, our new schedule of PD did open a new avenue for our partner site counselors allowing for participation from folks who had not been previously engaged.

Additionally, policy and admission changes were incorporated into the College Transition Plan (CTP) curriculum. While the CTP lessons and delivery schedule remained the same, the delivery platform changed to online rather than in the SLAM dual enrollment classrooms. A combination of live, online sessions (ie. through Zoom and Google Classroom) and pre-recorded CTP lessons were made available to students. Additionally, College Bridge worked with site counselors to assist in moving traditional college and financial aid application workshops to an online platform to engage families.

Math: Just prior to the COVID-19 school closures we administered a technology survey to M-PRéP's 375 dual-enrollment students and notified them of the possibility of moving to online instruction. The high schools closed within two days. We immediately set up Zoom meetings with our professor/teacher teams to transition to online instruction. Teachers who already utilized online tools with their students transitioned easily whereas others froze.

We spent three weeks gauging teacher needs and providing support in a fashion I can only explain as triage. K-12 lost about three weeks of instructional time while addressing equity issues with access to technology, along with ultimately deciding to move to a pass/fail grading system.

With school districts closed through the end of the semester College Bridge lost the ability to conduct scheduled in person professional development with teachers. Additionally, new items took priority in what our schools needed in terms of PD. College Bridge designed a series of PD modules are designed to serve beginner, intermediate, and advanced levels of teaching. The PD modules were similar for math teachers and college faculty and divided into four areas: (1) Getting through the final two months of the school year, (2) Using online tools to teach mathematics, (3) Online pedagogical practices including flipped classrooms and active learning, and (4) online math content, including documents and videos. We were fortunate to have been implementing online tools and the pedagogical practices mentioned above in the SLAM classrooms for two years. Additionally, our professors and teachers have been providing similar professional development workshops at Cal State LA for all math faculty and adjuncts for the past two summers.

Limitations of the Study

Data collection is perhaps the most difficult part of M-PRéP. One issue is the challenge collecting quantitative data from school districts on college readiness metrics (discussed in previous section). Data from sites tends to be incomplete as is noted throughout the report. A larger limitation is collecting student data for college students. We were able to collect about 80% of quantitative data obtained from student transcripts, Institutional Research departments, and NSC; qualitative survey data is harder to come by. Generally, we get a rate of return of approximately 50% on surveys but after the COVID closures we saw a decrease down to about 22%.

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