

## **Award Spending Plan - CSUMB Math Remediation Program**

As stated in our original application, one of the primary obstacles to STEM degree completion and timely progress toward STEM degrees is insufficient preparation in and fear of mathematics. Our vision is to improve the quantitative literacy and math skills of students, and affirm their confidence in their ability to “do math”, from middle school through university. Our “big audacious goal” is to eliminate the need for remedial mathematics in universities.

Expanding and enhancing the innovative programs that we have developed thus far is our highest priority and the vehicle to help us achieve our vision. By disseminating our methodology to community college partners and high schools, we also seek to ease transfer into four-year universities, and to prepare teachers to instill confidence and appreciation of mathematics in their students. This, in turn, will lead to an increase in STEM degrees awarded and decreased time to degree.

To this end we propose the following:

1. **Rigorous assessment of the program - both quantitative and qualitative.** In order to establish our methodology as a best practice, we need a systematic assessment of the program, and of the students’ mathematical competency going forward. We will hire an assessment specialist to develop an assessment model and an initial assessment for this program, which includes a measure of their success in subsequent educational experiences. Because CSUMB has earned two innovation awards, we will split this expense between the two programs. Once we establish a methodology and initial assessment of the programs, CSUMB will be able to assume the costs of developing and assessing further STEM innovations.
2. **Scaling up of the program:** We will conduct professional development workshops for faculty at high schools, community colleges and other CSU’s, ultimately leading to a conference on best practices in math remediation. The award will allow us to defray expenses for participants, thus enabling more faculty across the state to participate.
3. **Hiring a coordinator for the program’s activities.** This position is needed to develop and improve processes and practices associated with the running of the program, coordinate the various programs associated with math remediation (see #2 above), and to help us to scale up and continue to disseminate the program to K-12 schools, other CSU campuses and community colleges. Once the processes and procedures are well established, we will be able to either phase out this position or absorb it into other university functions, thus sustaining the activities.
4. **Expanding our pedagogical approach to pre-calculus, the calculus sequence, and introductory statistics classes.** Engage other disciplines (e.g. Business) in the development of math classes to suit their students’ curricular needs. This includes a math logic class tailored to computer science students. We will use the award funds to

support the faculty charged with designing these programs and training new faculty and faculty colleagues in other departments. If we are successful in these further innovations, we will be able to add these courses to our outreach to other universities (see #2 above and #5 below).

5. **Expanding our pedagogical and curricular model to interested community colleges and CSU and UC systemwide.** Several CSU's have already expressed interest in our program. On April 8, 2015, we will be making an initial presentation to CSU colleagues at an HSI STEM meeting at Cal Poly Pomona. The award will allow us to build upon this presentation with further meetings with colleagues throughout the state.
6. **Developing/expanding summer math camps for K-12 teachers/students.** Working with math educators and math education faculty at CSUMB, we will align the content of expanded summer math camps to the Common Core math standards. CSUMB faculty will also co-teach summer programs for high school students with the high school teachers. As more teachers are trained in improved methods for teaching mathematics, fewer students will arrive at colleges and universities in need of remediation.
7. **Enhancing use of technology in the programs.** We will upgrade our tablet PCs/classroom management systems for faculty/students, and acquire a set for use in our partnering high schools and community colleges. As the success of these methods is further disseminated, we will seek corporate foundation support for infusing more technology tools into the schools.
8. **Creating new STEM Student Success Center** and consolidating High Impact Practices including student advising for mathematics, Instructional Student Assistants (ISAs) for the Math Courses with the pedagogical approach used in developmental math, and supplemental instruction for math courses. Based on feedback on a recent external review of our biology program, we will use this Center as a base of operations to explore innovations in other areas that present major barriers to STEM degree completion, such as chemistry.
9. **Disseminating results in a variety of venues.** In addition to the dissemination of the model through workshops and conferences, we will make accessible our pedagogical concepts and curricular material via website and social media. While our first priority in this dissemination is our sister institutions in California, we hope California will further take a leadership role in improving the numbers of STEM degrees awarded nationwide.

CSUMB President Eduardo Ochoa participated in the White House College Opportunity Day of Action in December 2014 where he committed to increasing our STEM graduates by 20%. "Increasing access to higher education is at the heart of the mission of Cal State Monterey Bay, and is also central to our nation's efforts to address issues of income inequality and economic opportunity," Dr. Ochoa said. By realizing our vision to improve the quantitative literacy and

math skills of students, and affirm their confidence in their ability to “do math”, from middle school through university, we are confident that we will uphold that commitment and enable others to follow the same path. We are grateful for the opportunity afforded us through the Innovation Award.

Please remit funds to *CSUMB* and send to the address below:

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April 8, 2015

Selection Committee  
Awards of Innovation in Higher Education  
California Department of Finance  
915 L St.  
Sacramento, CA 95814

Dear Selection Committee Members:

California State University, Monterey Bay, appreciates that our efforts in innovation have been recognized. We are excited to expand our efforts to serve the people of California with these funds by shortening time to baccalaureate degrees and increasing the number of degrees awarded.

I have reviewed the math spending proposal and find it to be designed to scale and disseminate the innovation. The overarching goal, to eliminate the need for remedial math in college, is quite an ambitious goal, and it will guide our efforts at outreach to community college, middle school, and high school partners. Because a strong foundation in mathematics is needed in all STEM disciplines, improving remedial math education and eventually eliminating the need for it, will increase the number of STEM degrees awarded in California. The team behind this innovation is quite anxious to share what they have learned with others and the spending plan will enable them to do so on a large scale.

Sincerely,

A handwritten signature in black ink, appearing to read "Eduardo M. Ochoa".

Eduardo M. Ochoa, Ph.D.  
President