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| REQUESTOR(S): Sandhya Rao and Rosa Nguyen | |
| DATE SUBMITTED: 1/20/2016 | FUNDING YEAR: 2016-2017 |
| DIVISION: PSME | DIVISION DEAN: Victor Tam |

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| REQUESTED AMOUNT FROM STUDENT EQUITY: \$8000 |
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| ARE YOU REQUESTING FUNDING FROM OTHER SOURCES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | IF YES, PLEASE SPECIFY: |
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| # OF STUDENTS SERVED: ~900 Students per year | # OF FACULTY AND/OR STAFF SERVED: 2 faculty in the short term and up to 25 more faculty in the long term |
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Please provide a summary of the request and details on how this activity will directly serve the College's Student Equity goals. Be sure to include a description of which disproportionately impacted student groups this activity addresses, which specific student success indicators it supports, how this request addresses those groups and indicator(s).

The Chemistry Department wants to create a culture of equity that will promote student success and increase course completion rates, particularly for the targeted groups that are forming a larger percentage of our chemistry enrollment. We need to provide specialized support for these students both within and outside the structure of our courses in order to make a definitive impact.

From the data provided by Institutional Research, for the 2014-2015 academic year, there were a total of 866 students in the targeted ethnic groups that enrolled in chemistry courses (as opposed to 2277 enrolled students in non-targeted groups). Within the targeted groups, the success rate was 53% overall. For the non-targeted groups, the success rate was 71%. The enrollment of students in targeted groups has been increasing over the years (774 students in the 2012-13 year, 815 students in the 2013-14 year, and 866 students in the 2014-15 year).

There is an immediate need in our department to invest in faculty time and resources to understand why these students are struggling in Introductory and General Chemistry courses. If granted the requested support, faculty can identify potential interventions and implement strategies to help these students succeed, leading to higher course completion rates overall; all high priority goals of the 2014-2015 Student Equity Plan.

Funding is being requested to support two faculty members (Dr. Sandhya Rao and Dr. Rosa Nguyen) to engage in activities to:

1. explore the reasons and factors as to why Foothill Chemistry students in these targeted groups are struggling
2. learn more about local and nationwide Chemistry programs that serve underrepresented students, and learn about Chemistry classroom strategies and techniques that have shown to be effective with this group.
3. conduct a literature review on curriculum strategies that have proven effective in helping chemistry students in this targeted population succeed.

Dr. Rao will focus on the General Chemistry (Chem 1A) population and Dr. Nguyen will focus on the Introductory Chemistry (Chem 25 and Chem 30) population as these two groups have different student compositions and have different needs.

It is hypothesized that students struggling in Introductory and General Chemistry frequently need more individualized attention as they may be possessing critical gaps in their chemistry foundation or basic math skills. These learning difficulties are widespread and vary from student to student. Currently, many underprepared students perform poorly in the introductory chemistry sequence due to the fast pace of the course and the inability to get enough support to help them succeed. This may be due to lack of time, due to work and family commitments, or lack of knowledge of how to get help. It may also be possible that students lack the time management, critical thinking, and study skills that are necessary to be a successful STEM student at Foothill. These theories are based on past reflections and anecdotal evidence. We believe by taking the time to understand the target population and study other programs that are also tackling these same issues, our department will be much more prepared to meet the challenges head on, and increase the success rates of the target population.

Please indicate the criteria used to select the students and/or faculty/staff participating in this activity.

The activities will be conducted by two full-time chemistry faculty, Sandhya Rao and Rosa Nguyen

What outcomes are you predicting for this activity (or for those who participate) and what metric(s) will be used to evaluate if the activity is supporting increased outcomes for those students on the indicators (as described above)?

These activities will be beneficial to faculty in their professional development and growth. Timesheets will be kept by each faculty member detailing how hours are spent each week. The information on classroom and curricular strategies will be compiled into a report or presentation and shared with the rest of the faculty in the chemistry department (5 additional full-time faculty and 20 part-time faculty). Based upon learned information, classroom interventions may be implemented in the Fall of 2016 or sooner, and the effectiveness of these strategies will be communicated to the rest of the department and scaled up in the curriculum as seen fit.

Faculty Outcomes: 1) To learn more about why targeted students are struggling in Chemistry 2) To learn more about classroom and chemistry curriculum strategies that have been shown to be effective on this population.

Metric: Compilation and dissemination of information on reasons for student struggle and strategies to help target groups. After implementation of strategies (2016-17 school year), course completion rates of target groups will be compared to historical data.

Please cite any research or evidence relevant to your proposal.

Research will be conducted as part of the planned project.

Please describe plans for sustaining the activity (if possible) without Student Equity funding.

Without funding, all work must be done with currently available faculty time and resources. Without the funding, faculty will work on these projects as time and resources are allowed, leading to a much slower time-scale. The work would be possibly incorporated into Dr. Rao's 2017-2018 sabbatical project.

Please provide a timeline for implementation and a schedule of planned activities.

Winter 2016: (2hrs/week * 8 weeks = 16 hrs/faculty member)

Spring 2016: (2 hrs week * 12 weeks = 24 hours/faculty member)

- 1) (Winter 2016) Survey students in Chemistry 1A and Chemistry 25/30 classes to better understand reasons for poor performance. Follow up with student interviews as needed.
- 2) (Winter/Spring 2016) Conduct a literature review of effective STEM/Chemistry classroom and curricular strategies that have proven to be effective for students in target groups. In particular, examine:
 - a) How programs teach critical thinking and problem solving strategies to STEM students
 - b) How to teach time management and study skills in a chemistry setting to target groups
 - c) How to bolster chemistry and math fundamentals in students who are lacking them
- 3) (Winter/Spring 2016) Research and contact academic programs who currently have specialized ways to help targeted groups and learn about strategies, techniques and structures that have been shown to be effective (i.e. De Anza, UC Berkeley, SJSU)
- 4) (Spring 2016) Research any conferences or workshops that will be useful for faculty members to learn how to effectively help targeted chemistry students (for example BCCE, ACS, AERA, etc.)

Total: 40 hours/faculty member * 2 faculty members = 80 hours @ approx. part-time rate of \$100/hr = \$8000

Per the **State Chancellor's Office**, Foothill College's **Student Equity Plan** is comprised of **five focus areas** (*Access, Course Completion, ESL and Basic Skills Completion, Degree and Certificate Completion, and Transfer*). The College then identifies disproportionately impacted students groups and associated activities for each focus area.

Each request must support increased outcomes for the associated students groups via **one (or more)** of the activities detailed in the **Student Equity Plan**. Using the check boxes below, indicate the **student group(s)** and the **associated Equity Plan activities** the request supports. *NOTE: You cannot mix and match groups and activities across factors.*

ACCESS

Target Populations + Current Gap

Asian Indian (-4%) Veterans (-4%) Vietnamese (-3%)

Associated Activities

- A.1 – Marketing and Outreach to Recruit Students from Underrepresented Student Groups

COURSE COMPLETION

Target Populations + Current Gap

- African American (-15%) Low Income (-10%) Latino (-7%)

Associated Activities

- B.1 – Develop and Implement a Mentoring Program
 B.2 – Professional Development to Assist Faculty and Staff with Identifying and Implementing Strategies to Increase Success of Disproportionately Impacted Students
 B.3 – Support 3SP Early Alert Activities
 B.4 – Plan for the Expansion of First Year Experience
 B.5 – Provide Equity Research
 B.6 – Develop Online Access to Data about Subpopulations of Students
 B.7 – Reduce Financial Barriers to Course Success for Low Income Students

ESL & BASIC SKILLS COMPLETION

ESL: Target Populations + Current Gap

- Native Hawaiian or other Pacific Islander (-23%) Females (-3%) Latino (-7%)

ENGLISH: Target Populations + Current Gap

- African American (-19%) Low Income (-7%) Filipino and Pacific Islander (-13%)

MATH: Target Populations + Current Gap

- African American (-23%) Low Income (-6%) Latino (-6%)

Associated Activities

- C.1 - Pilot Multiple Measures of Assessment

DEGREE AND CERTIFICATE COMPLETION

Target Populations + Current Gap

- African American (-26%) Latino (-17%) Low Income (-12%)

Associated Activities

- D.1 – Use Student Educational Plan Data to Project Student Needs

TRANSFER

Target Populations + Current Gap

- African American (-15%) Latino (-16%) Low Income (-10%)

Associated Activities

- E.1 – Facilitate the Assessment of ADT Learning Outcomes for Disproportionate Impact

INSTRUCTIONS FOR SUBMISSION

Please submit your completed request via email to the Student Equity Workgroup Tri-Chairs:

Paul Starer (starerpaul@fhda.edu)

Hilda Fernandez (fernandezhilda@fhda.edu)

Roberto Sias (siasroberto@fhda.edu)

FOR ADDITIONAL INFORMATION, PLEASE REFERENCE THE FOLLOWING LINKS

Foothill College Student Equity:

<http://www.foothill.edu/president/equity.php>

Student Equity Expenditure Guidelines:

http://extranet.cccco.edu/Portals/1/SSSP/StudentEquity/Student_Equity_Expenditure_Guidelines_2015-16_Final.pdf