

**Give Fresno State pre-service teacher's positive experiences with teaching the new pedagogical science standards through the Fresno State "Bulldog STEM-Rich Makerspace." This will allow students to learn how to deliver STEM-Rich and innovative lessons to students visiting the 'Bulldog STEM-Rich Makerspace' as part of the undergraduate science courses.**

### **CURRENT CHALLENGE:**

At a time when science and engineering are growing in their societal importance it would seem that both national and local educational policies would support access to a high-quality education in science and engineering for all students. However, access to high quality STEM learning remains determined in large part by an individual's socioeconomic class, racial or ethnic group, gender, language background, disability designation, or national origin. The most compelling challenge facing U.S. education is how to provide all students a fair opportunity to learn (OCR, 2014). As a result it is more crucial than ever to make the early science teaching experiences of future K-8 teachers a successful foundational basis in their preparation pathway. To break the persistent cycle of teachers who lack confidence and content knowledge to teach STEM there is a need to give Fresno State pre-service teachers positive experiences with teaching the new pedagogical science standards (NGSS) in a campus-based supportive environment.

### **PROPOSED SOLUTION:**

The Bulldog STEM-Rich Makerspace for Young Makers: To break the persistent cycle of teachers who lack confidence and content knowledge to teach STEM there is a need to give Fresno State pre-service teachers positive experiences with teaching the new pedagogical science standards (NGSS) in a campus-based supportive environment. The Fresno State 'Bulldog STEM-Rich Makerspace' will address the early stage of the teacher preparation for future teachers of STEM in grades K-8 and become a destination for underserved Central Valley youth. The 'Bulldog STEM-Rich Makerspace' is based on the following premise: in order to change the way STEM is taught in elementary schools, we need to change the way future elementary teachers experience STEM in their undergraduate courses. Fresno State students will learn how to deliver STEM-Rich and innovative lessons to students visiting the 'Bulldog STEM-Rich Makerspace' as part of undergraduate science courses that could also be part of the teacher preparation pathway. Undergraduates would develop, teach, and then revise the lessons before delivering them again to students. Students visiting the Makerspace would experience deep STEM learning in a unique environment on the campus of Fresno State. The high percentage of Central Valley children living in poverty, attending low performing schools, and lacking access to highly qualified STEM teachers and makerspaces is also a strong reason for creating this.

### **BENEFITS TO FRESNO STATE:**

The innovative 'Bulldog STEM-Rich Makerspace for Young Makers' would create and support a community of STEM and education practitioners that includes the undergraduate students and empowers them to become active participants working together as contributors along with STEM faculty and the community. Understanding that children's visits to science centers, museums, and special exhibits do have a significant influence with their science and technology understanding, attitudes, and behaviors is strong argument in favor of the 'Bulldog STEM-Rich Makerspace'. The campus would become THE destination for underserved students and teachers in a region that lacks a world-class children's museum and out-of-school STEM experiences. Specifically addresses Strategic plan theme 7 - Engagement With The Region

### **ADDITIONAL INFORMATION:**