

Project Title: Exposure to STEM: Diversity in Maritime Transportation

Project Abstract (Brief Description): Although the 1954 U.S. Supreme Court decision in the case of Brown vs. Board of Education declared state laws establishing segregated public schools unconstitutional, in 1957 Arkansas Governor Orval Faubus tried to prevent nine African American students from attending school at Little Rock Central High School (LRCHS). Faubus' attempt to block access to the students, using the Arkansas National Guard, resulted in President Eisenhower using soldiers from the 101st Airborne Division from Fort Campbell, Kentucky, to escort the students into the high school. Even though all students, regardless of race, can now attend public schools, segregation in a different form is still very evident when considering Advanced Placement (AP) classes. The lack of students from underrepresented minorities is especially evident in AP classes affiliated with the Science, Engineering, Technology, and Mathematics (STEM) disciplines. Identify underrepresented groups in AP classes at LRCHS. Although the demographic of LRCHS is almost 60 percent African American, the lack of enrollment in AP classes by African American students is noted; "perhaps more serious than the social separation is the academic segregation that persists at Central. Remedial classes are mostly black. Advanced Placement classes are mostly all white." (Harris et al., 2007). Significance: Students who enroll in AP classes are more likely to graduate from college. Furthermore, as discussed in Aldeman (2006), Dougherty et al. (2006), and Huebner et al. (2008), access to academically challenging high school coursework is the single greatest contributor to college graduation rate (more so than income level and parent's educational level). Expectation: Encouragement and mentoring will be provided to minority students who wish to pursue AP level coursework through collaboration with the Advancement Via Individual Determination (AVID) program at LRCHS. Recruit and retain students from underrepresented groups through K-12 outreach. The most effective way to impact future college students and professionals is to develop relationships with them early in their educational life. To change the lack of participation of underrepresented groups in high-school and college STEM, K-12 students will be exposed to STEM through modules and presentations. Significance: Students exposed to STEM research and principles, drives interest in 1) STEM fields where there are currently twice as many job opportunities (Fudge, 2013) and interest in 2) pursuing college level math skills, skills that are forecast to be required for nearly 70 percent of jobs in the near future (Packard, 2011). Expectation: College bound students will be recruited and retained. Develop mentoring, interaction, and personal development. Existing programs at the UA, PSC, LRCHS, and the VP will be utilized to enhance the learning of underrepresented students. Significance: Mentoring, interaction, and personal development has lead to increased participation in STEM (Church, 2010; Packard, 2011; Palmer et al., 2013). Expectation: The mentoring interaction and personal development structure of partner institution members – UA professor – UA graduate students – PSC students – LRCHS, and VP students will prosper during the time of this project, resulting in a mentee becoming a higher level mentor by graduating from a respective school and continuing on in the cycle. Demonstrate increased enrollment of underrepresented students in STEM. The quantity and quality of the students participating in the existing programs will be tracked. Significance: Increased participation by underrepresented students in STEM leads to additional participation by other previously non-participating underrepresented students (Aldeman, 2006). Expectation: The quantity and quality of the students participating in the existing programs will increase.

Describe Implementation of Research Outcomes (or why not implemented) - Place any photos here <i>To be determined upon conclusion of the project:</i>
Impacts/Benefits of Implementation (actual, not anticipated) <i>To be determined upon conclusion of the project:</i>
Web Links: <a href="http://martrec.uark.edu">martrec.uark.edu</a>
Budget (Funding) Amounts & Source(s) (US DOT +Match(s) =Total Costs): \$29,987 from MarTREC and \$15,154 academic salary. Total \$45,141
Project Start and End Dates: 08/13/18-08/14/19
Principal Investigator(s) and Contact Information: Richard Coffman, Civil Engineering, University of Arkansas (479) 575-8767 <a href="mailto:rick@uark.edu">rick@uark.edu</a> Id pending
Principal Investigator Institution (University): University of Arkansas