

MUREP Aerospace Academy (MAA)

Institution: Tennessee State University

Title: MUREP Aerospace Academy

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High schools in the Davidson County Tennessee area continue to struggle in the areas of math and science. Schools impacted by the Tennessee MUREP have some of the lowest math and science proficiency rates in the district and state. According to the 2020-2021 Tennessee Department of Education Report Card, these schools are well-above the state in rates of poverty. African American and Hispanic students rank low in math and science proficiency in comparison with the district and state. Of the proposed target population, 13 of the 15 schools scored at level 1 on school growth scores which indicates significant evidence that students are making less than expected growth. Also, 80% of the schools scored below grade level in the subject area of math. Finally, in the subject area of science, the majority of schools ranged from scores less than 5% to 32.7%, with one outlier at 92.5%.

Tennessee State University, a Historically Black College/University located in Nashville, Tennessee, proposes to house the Tennessee MUREP Aerospace Academy. The goals of the MUREP project are to: 1) Inspire underserved and underrepresented high school students to pursue their interest in STEM post-secondary degrees and careers, 2) Engage underserved and underrepresented students in STEM experiential learning experiences utilizing technology to develop their STEM identity, skills, and knowledge, 3) Educate students by utilizing culturally relevant STEM curricula and effective evidence-based strategies designed by NASA and other leading STEM professionals, and 4) Increase high school students' and their families' knowledge and awareness of STEM internships, degrees, careers, and professional skills. Key strategies to reach the proposed goals include multi-faceted initiatives, such as Experiential Learning Experiences, Aerospace Education Laboratory (AEL), Engagement with STEM professionals, College and Career Readiness, Family Empowerment Sessions, and STEM Professional Development.

The proposed program will build on the prior success of NASA and MUREP sponsored programs at TSU, expanding the reach of the program with an innovative program design and community partnerships. The project proposes an Early STEM Institute comprised of three colleges: College of Hydrology, College of Lunar Explorations, and College of Acoustic Damping. Each college will contain problem-based learning pedagogies enriched with hands-on instructional strategies conducted in technology infused university classrooms. Additionally, this program will capitalize on the NASA Aerospace Education Laboratory (AEL), which is comprised of an inflatable planetarium, drones, robotics, 3-D Printers, Zspace, Oculus Rift, and a computer lab with NASA software to further inspire, engage, and educate students.

The project proposes to achieve the proposed goals and expand its reach from focusing only on grades K-8, to a focus on high school students. The project intends to increase capacity through intentional strategic partnerships with high schools of the Metropolitan Nashville Public School District. Additionally, this project proposes an intentional STEM ecosystem through strategic partnerships with local schools, museums, Power Youth, and Vanderbilt University. Such

collaborations will provide opportunities for STEM fieldtrips and mentoring for young learners and essential quality professional development.

Finally, this project proposes to capitalize on the most essential partnership for fostering transformative learning, the student's home. The project proposes to accomplish this through innovative Family Empowerment Sessions (FES) that serve as a barrage of valuable resources, which will educate parents on STEM degrees, careers, and college readiness.