

MUREP Inclusion Across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (MUREP INCLUDES)

Title: Drake State Engineering Frontiers Coalition

Organization: J. F. Drake State Technical College

Primary Investigator: John B. Ellis

Summary: This proposal seeks to challenge the disparity status quo that continues to exist in the representation of racial and ethnic minorities and women in science and engineering fields. To alleviate the existing barriers, Drake State Community and Technical College propose to create a comprehensive collaborative project aimed at coordinating efforts between NASA's Marshall Space Flight Center (MSFC), aerospace-industry partners, government agencies, non-governmental organizations, and institutions of secondary and higher education. This project includes established commitments from two minority-serving institutions, one majority-serving institution, five industry partners, two government partners, five non-profit partners, three school districts, and one homeschool cooperative. The involvement of these agencies and organizations will contribute to alleviating the problems of STEM engagement and STEM skills development starting in secondary schools, continuing through undergraduate education, and creating opportunities for pursuing graduate studies in STEM disciplines.

Drake State, a minority-serving institution, will leverage its established relations within the secondary and postsecondary educational pipeline for the coordination of the project. Additionally, Drake State will capitalize on its existing facilities such as, but not limited to, the 3-D Printing and Construction Laboratory, machine tool, mechatronics, and robotics equipment and other laboratories, as well as its instructors and students to engage members of academia and aerospace industry in conducting NASA-related research. This project includes impactful activities, which are referenced in the extant research, to be beneficial for reaching equity. Such activities include summer bridge programs for secondary school students, educator professional development, research opportunities, mentoring, and career exploration. Each year, the project plans to serve at least 90 secondary school students, 13 college students interns, and 20 secondary school science teachers.

The designed research infrastructure will align with NASA Strategic Goals for STEM Engagement and Mission Directorate Priorities by creating continuous opportunities for engagement in meaningful STEM activities for URM students starting with grade 8 and continuing through undergraduate education in engineering while building on the foundation for graduate education or career pathways. The project aligns with NASA's Marshall Space Flight Center research priorities as it focuses on Space Systems research including 3D printing for space habitation and lunar landing pad design and testing.