Mar 5th, 7:00 PM - 9:00 PM

Teaching 21st Century Reasoning Skills through an Authentic Interdisciplinary STEM Research Experience

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Real STEM Grant

A Race to the Top Grant funded through the Governor’s Office of Student Achievement (GOSA) awarded to Georgia Southern University.

Through partnerships, develop and implement high school courses that focus on interdisciplinary STEM scientific research, leading to a three course sequence that constitutes an academic pathway and supports a STEM school designation.

This grant proposes that when teachers are trained in the tenets of the grant, they will use these strategies in designing course work for students that will result in increased STEM achievement, increased interest in STEM and STEM careers, and STEM literate citizens better prepared to low SES, and under-represented populations.

Tenets of the Grant - Authentic Learning

I. Place-based Education
A. Learning takes students “out” of the classroom and into the community and natural environment
B. Students learn how local systems relate to regional and/or global systems
C. Students collaborate with research scientists, local citizens, organizations, agencies, businesses, and/or government

II. Problem-based Learning
A. Engages students as participants immersed in real-world, ill structured, problematic situations
B. Organizes curriculum around a holistic problem, enabling student learning in relevant and connected ways
C. Coaches student thinking and guides student inquiry, facilitating learning toward deeper levels of understanding

III. Teaching for Understanding (UbD)
A. Identify Desired Results
B. Determine Acceptable Evidence
C. Coaches student thinking and guides student inquiry, facilitating learning toward deeper levels of understanding

IV. Collaborative Partnerships
A. Emphasizes connections between traditionally discrete disciplines
B. Works with a range of sources of information and perspectives
C. Integrates multiple disciplines to solve problems

The required ALSQ project student assessment shows statistically significant increases in student attitudes related to Importance of STEM, Enjoyment of STEM, Interest in STEM Career, Intrinsic Motivation (3.36 - 3.95) and Intent to Persist (3.32 - 3.69), increases were also shown in Self-Management Self Regulation Skills (3.81-3.90) although they were not statistically significant. The i2STEM tracking specific project STEM Interest survey asked students if they indicate interest in STEM in four areas: general STEM interest, confidence in using science, technology, engineering, and math...regulation

Once a year, high school grant participants arrive on the campus of Georgia Southern University to share with their students about the experiences they have had in STEM. That is something that we aren’t able to do in other classes.”

Institute for Interdisciplinary STEM

The Institute for Interdisciplinary STEM Education (i2STEMe) will establish collaborative interdisciplinary programs committed to excellence in K-20 STEM teaching and learning, with a focus on rural, diverse, low SES, and under-represented populations. The Institute will address problems indigenous to the rural environments of the region, including issues of cultural diversity and cultural relevance within our diverse population, matters of equitable access to STEM for low SES students, and concerns about the relevance of STEM for rural students. Long-term goals of the Institute are to establish partnerships across Georgia, the southeastern region of the United States, nationally, and even internationally to address issues of STEM education in rural areas.