

Session Title:

Improving K-12 Science Instruction – Higher Education/K-12 Partnership, Professional Development, Mentoring & Collaborative Strategies

MSP Project Name:

The NanoBio Science Partnership for the Alabama Black Belt Region

Presenters:

Michele Williams, Southeastern Consortium for Minorities in Engineering (SECME)
Shaik Jeelani, Tuskegee University

Authors:

Michele Williams, Southeastern Consortium for Minorities in Engineering (SECME)
(Lead)
Shaik Jeelani, Tuskegee University

Project Session**Strand 2****Summary:**

This partnership among 5 universities, 9 school districts, 5 community colleges, STEM industry, science centers and SECME, a pre-college STEM initiative is led by Tuskegee University and focuses on the Black Belt region of Alabama, among the poorest and most academically challenged in the state. Through the development of innovative content, rich in nanobio science, including 3D simulations, this project seeks, in part, to improve academic performance in middle grades by improving teachers' instructional practices and content knowledge. Partners will share year one informal and formative evaluations of the Summer Institute professional development component of the project and discuss using these to inform program development and modifications to year two and beyond.

Section 1: Questions framing the session:

Research questions for the project included:

How does participation in the Teacher Training Summer Institute and project classroom activities impact middle school science teachers' beliefs and practices?

a. Does participation in the project increase teachers' use of inquiry-based, student-centered and/or problem-solving strategies?

b. What are the ways teachers' have modified their science teaching beliefs and practices over the course of the project?

In this session presenters will discuss early data and indicators in response to these questions and ask: *How can early project findings inform and direct changes to the content and structure of the Summer Institute and teacher workshops for deeper and broader impact?*

Section 2: Conceptual framework:

The partnership among universities, K-12 and industry offers tremendous benefit and potential for improvement in K-12 academic outcomes. This project provides an opportunity for science-rich institutions to engage their surrounding communities to share these important benefits to ultimately provide students access and opportunity for academic achievement – especially in STEM.

The project partners recognize, however, that the K-12 education paradigm – especially in high-needs districts and communities – is fraught with challenges beyond just the need for content and professional development. In addition, the project seeks to utilize formative evaluation and participant feedback to assess and modify professional development and subsequent teacher support strategies.

The SECME Summer Institute, an eight-day residential STEM professional development venue for K-12 educators, has a 36-year legacy for improving not only content knowledge but also pedagogy to improve instructional strategies and content knowledge of teachers, and hence, student achievement.

As a partner in this MSP project, SECME provides a delivery vehicle for the innovative content being developed by the MSP partners; utilizes its framework for professional learning communities led by Master Teachers to follow participants' progress and implementation; and extends the project impact with its student competitions and projects and parent engagement strategies. This project offers a unique opportunity for research, evaluation and improvement of the tools/processes for delivery of professional development and the evaluation of its efficacy and impact over time and in the classroom.

While the formal formative and summative evaluation will utilize test scores as one of several indicators, the SECME Institute and program structure offers additional opportunities to assess progress and impact at shorter intervals, benchmark program objectives and solve or circumvent potential problems.

Section 3: Explanatory framework:

The project partners will share the findings of the 2012 SECME Summer Institute evaluation, which includes disaggregated results for the NanoBio Science project. Participants' responses indicate the content, facilitators and framework for the Institute were extremely effective. There is still a great need, however, for additional support to ensure classroom teachers are effectively delivering the content. The disparity in participating teachers' ability to accomplish this such that students across the nine participating school districts benefit highlights the need for the role of Master Teachers as proposed in the initial proposal; and may indicate the use of this feedback to identify where the greater needs exist.

The unique capabilities of this project's partners provided the opportunity for collaboration in the development of interventions through the partner universities' education faculty; seasoned Master Teachers in each of the participating districts; administrators; State education partners, including the Alabama Math Science and Technology Initiative (AMSTI) and SECME staff and Master Teachers.

Strategies to address some of the needs include restructuring of local workshops during the school year, to meet local needs, along with the modifications to the Summer Institute, as described below.

Section 4: Discussion:

The Institute findings and subsequent mid-year survey of Institute participants' classroom experiences will be utilized to modify the 2013 SECME Summer Institute NanoBio Science academy and workshops provided. Modifications including frequency, variety and length of professional development module offerings and training for Master Teachers to improve instructional coaching. In addition, State Department of Education collaboration will be strengthened to provide classroom teachers with greater understanding to align content provided with state standards and course of study.

The use of the Institute data and mid-year survey will all serve to inform the project's direction, and provide the opportunity for substantive improvement in outcomes.

Section 5: How will you structure this session? What is your plan for participant interaction?

This session is intended to be highly interactive. We invite participation of all constituents, in the hope that the questions framing this session will elicit discussion among session participants about the specific strategies framed in the abstract, but also provide varying perspectives, feedback and best practices from K-12, higher education and other participants. The initial presentation of data (3-5 minutes) will be followed by a series of questions meant to serve as a catalyst for discussion of proposed project modifications—benefits and drawbacks – and participants' experiences with strategies discussed, as well as other best practices elicited from the audience.