

Albany State University STEM Education Improvement Plan Abstract

Introduction: Dougherty County underperformed in comparison to the rest of Georgia in terms of higher education achievement and median household income. Data indicates that the average SAT scores of the Dougherty County school system in 2015 was approximately 14.5 percent below the state average. The current institutional trend for the first time college applications at Albany State University is a 40.48% decline in acceptance due to students being ill prepared based on ACT and SAT performances. An important reason for students' low test scores is lack of interest towards academics, specifically for STEM disciplines, that could be attributed to insufficient exposure to these professions.

Albany State University recognizes the need for an increased knowledge of STEM content and wishes to increase knowledge beginning with the public schools served by ASU. Our plan will involve ASU faculty working with both 9-12 teachers and students from Dougherty and Lee Counties as well as our undergraduate students in STEM disciplines. Based upon the need for greater STEM education in southwest Georgia, ASU wishes to participate in the STEM Education Improvement initiative. The ASU-STEM Education Improvement Project will involve 9-12 high school teachers and 9-12 students in a series of development and research activities such as Saturday Academies, teacher workshops in innovative teaching approaches including technology infusion and mentored research for 9-12 students.

Goal, Objectives and Expected Outcomes

The proposed project seeks to address all three of the Complete College Georgia goals:

- Increase the number of K-12 students who are prepared for and are interested in majoring in STEM disciplines in college;
- Increase the success and completion rates of students majoring in STEM disciplines; and
- Increase the number of qualified K-12 STEM teachers.

The Goal of the project is to increase students' motivation in pursuing STEM disciplines and increase the number of teachers trained to use in innovative teaching approaches including technology effectively in the classrooms.

Specific objectives include:

Objective 1: Increase the number of 9-12 students interested in pursuing STEM disciplines in college by 5%.

Objective 2: Improve the knowledge of in innovative teaching approaches including technology-oriented instructional techniques among 9-12 STEM teachers by 5%.

Specific Expected Outcomes include:

- **Increased student learning**
- **Increased student critical thinking and problem solving skills**
- **Increased passing courses**
- **Increased student progression**

- **Increased student interest in science and technology**
- **Increased team work projects**
- **Increased student knowledge of the field of mathematics and computer science**
- **Increased teachers trained to effectively use technology in the classroom**

Detailed Project Plan

This project is composed of a series of activities that involves grade 9-12 teachers, students and ASU faculty.

Activity 1: Technology Oriented Workshops for Grade 9-12 Teachers. We will organize two workshops for five HS teachers, team-led by four ASU faculty. Workshops will discuss and provide hands-on activities around the following issues with 9-12 teachers from Dougherty and Lee counties' school systems: unit level student learning objectives, integration of small group exercises, classroom activities and student learning objectives, teaching using innovative teaching approaches including technology, integration of student-centered remediation, motivating students to be prepared for class, in-class active learning exercises, and designs for and conduction of classroom research studies.

Activity 2: Saturday Academy for Grade 9-12 Students. Sixteen Saturday Academy workshops for ten 9-12 students will be organized. In each five hour workshop, three ASU faculty members and one high school teacher facilitator will lead ten students. Faculty members will provide a lecture and hands-on activities on a particular STEM subject, share success and challenges, as well as ask questions of the group and/or the workshop facilitator. A total of four Saturday Academy workshops are dedicated as SAT preparation workshops for grade 11 and 12 students. In each Saturday academy workshop we will maintain a pre/post survey to analyze the productivity of the workshop for improvement.

Project Management: Dr. Seyed Roosta, professor and department chairperson, will serve as the Principal Investigator. He will be responsible for the overall implementation of the project, while two participants will be responsible for data collection, survey administration and analysis. Each participant will be involved in workshops and Saturday Academy activities. Another participant will serve as the evaluator of the project. The evaluator will meet with the PI periodically and will provide guidance for project activities.

Contact Information

Seyed Roosta, Ph.D.

Professor and Chairperson

Mathematics and Computer Science Department

Albany State University

229-430-4885

seyed.roosta@asurams.edu