2015 STEM SYMPOSIUM
Pat Peterson Museum Education Room
Georgia College

March 11, 2014
2:00 – 4:00 PM

The STEM Mini-Grants Program is a project of the Georgia College STEM Initiative, funded by the University System of Georgia’s Presidential Science, Technology, Engineering, and Mathematics Initiative.
USG Presidential STEM Initiative

In 2007, the University System of Georgia unveiled a system-wide Science, Technology, Engineering and Mathematics (STEM) Initiative, MATH + SCIENCE = SUCCESS. The goal of the STEM Initiative is to target three sets of interconnected strategies: (1) promoting K-12 student preparation for and interest in majoring in STEM in college, (2) increasing the success of STEM majors in college, and (3) producing more and better science and mathematics teachers for the schools.

As part of the USG initiative, Georgia College received funding for several strategic projects, including the mini-grant program which began in 2008. In 2009, an inaugural USG State STEM Institute brought together STEM practitioners and pedagogy experts from across the state to examine best practices in STEM teaching and learning. Since then, over 50 faculty members from Georgia College have participated in regional STEM conferences and institutes hosted across the state and beyond. In March 2011, Georgia College hosted a STEM Institute on active-learning and 42 faculty members attended. Then, in 2011-2012, Georgia College continued the mini-grant program and other STEM projects as part of the revised and enhanced USG STEM II Initiative. In recognition of the broad-based accomplishments in STEM, Georgia College received the first STEM Award in Post-Secondary Outreach from the Technology Association of Georgia Education Foundation in 2012.

Georgia College STEM Symposium

The goal of the Georgia College STEM Mini-Grant Program is to stimulate innovative projects that improve instruction and student learning in STEM disciplines and in programs that lead to initial teacher certification in STEM. Grants are available to fund teaching innovation projects that target university-level introductory STEM courses and STEM-focused K-16 learning communities that promote higher education and public school partnerships. In addition, the program seeds projects that are competitive for external funding. After seven years of the mini-grant program, a total of 81 grants have been funded and the program has had an impact on more than 4,000 K-16 faculty, teachers, and students.

This Seventh Annual Georgia College STEM Symposium provides a forum for STEM Mini-Grant recipients to present their findings, to engage in conversations around STEM and education issues, and to discuss ideas for future collaborations. The event also provides an opportunity for interested faculty, staff, students, and guests to learn about the remarkable work occurring in STEM at Georgia College and the positive impact on our broader communities.

For more information about STEM at Georgia College, visit http://stem.gcsu.edu.
Symposium Agenda

Welcome and Acknowledgements

Order of Presentations (9-11 minutes)

2:10-2:50

Caralyn Zehnder/Christine Mutiti/Kalina Manoylov: Inquiry-guided Environmental Science Labs

Allison VandeVoort/Samuel Mutiti: Incorporating Web-based Technologies into ENSC Courses

Rui Kang/Catrena Lisse/Sandra Webb: From STEM to STEAM: The Impact of an Interdisciplinary Capstone Curriculum on Student Learning and Pedagogical Implications

Break

3:00 – 3:25

Sandra Webb/Betta Borelli/Victoria Deneroff: Sustaining the STEM Professional Learning Community at Northeast High School: An Alternative Approach to Induction of New STEM Teachers

Marcela Chiorescu/Darin Mohr/Brandon Samples: Enhancing Student Learning Experience through Integration of Maple

Break

3:35 – 4:00

Jeanne Haslam: Supplemental Instruction Leadership

Discussion and Wrap-Up

Ryan Brown

Charles Martin
2015 STEM SYMPOSIUM
ABSTRACTS

Caralyn Zehnder, Christine Mutiti and Kalina Manoylov (Biological and Environmental Sciences)
Inquiry-guided Environmental Science Labs
There are more than 400 students who chose to take Environmental Science 1000 lecture and lab to fulfill their Area D requirement of the GCSU core. We saw an opportunity to better introduce these students to environmental science by designing inquiry-based labs. Additionally we wanted to align the lecture and lab content. In order to match-up the lecture and lab content, we had to create two new labs and we implemented these labs earlier this semester. The new ‘Age-structure diagrams’ lab uses 2010 US Census data, and students evaluate the dynamic changes in US population and compared them with changes in human population globally. In the new “Air pollution” lab students to examine indoor air quality and compare indoor and outdoor air pollution. We enlisted the help of 5 environmental science majors to help us design the new inquiry-guided labs. Our student collaborators independently designed labs, participated in several focused workshops, and tested 6 labs new inquiry-guided labs. For the inquiry-guided labs, each student group will design an experiment, conduct the experiment and then present their results to the class. These labs will be tested in our GC2Y course, Water & Society, later this semester and incorporated in ENSC 1000L next fall.

Allison VandeVoort and Samuel Mutiti (Biological and Environmental Sciences)
Incorporating Web-based Technologies into ENSC Courses
With the strong popularity of the Area D course ENSC 1000/1000L, the only Area D course offered by the Environmental Science Program, many students have expressed a desire to enroll in an additional ENSC course to meet the Area D degree requirements. Our objective was to develop a new Area D course, ENSC 1050 (Sustainability and the World Population) for non-science majors that could be taught both online and face-to-face. In addition to developing web-based content for ENSC 1050, we also proposed to create web-based learning modules for additional courses that utilize student-centered activities. Through the STEM mini-grant and the Hybrid/Online Course Development Workshop offered by IDEAS, the ENSC 1050 course has been fully web-developed in a GeorgiaVIEW sandbox space, and is ready for use in future semesters. Web-based modules were incorporated into the majors section of ENSC 1000 during Fall 2014, and assessment data is currently being generated to quantify results. Additional web-based modules will continue to be developed and assessed in Ecology and Economic and Environmental Geology during this Spring semester.
Rui Kang, Catrena Lisse, and Sandra Webb (College of Education; Chemistry, Physics, & Astronomy; College of Education)
From STEM to STEAM: The Impact of an Interdisciplinary Capstone Curriculum on Student Learning and Pedagogical Implications
A multi-faceted approach is necessary to aid today’s students in making decisions about complex, ill-structured socio-scientific issues. It is imperative to conceptualize STEM education as an integrated approach to studying the grand challenges of our era. The objective of this presentation is to describe and analyze the impact of a STEM to STEAM-focused interdisciplinary Capstone curriculum (Grades 7-10) on student learning from a pedagogical perspective. The curriculum serves low-income minority students enrolled at Georgia College’s Early College high school. Centering on the theme of sustainability, the curriculum integrates knowledge and skills in STEM with literacy practices, creative thinking, and research. This presentation will highlight three essential features of the Capstone curriculum: (a) emphasis is on research skills, college readiness, and student-led inquiry and discourse, not on a single science product; (b) collaboration among teachers of all subject areas, from STEM to STEAM, is expected; and (c) transformation of classroom practices is on a day-to-day basis; this is not a one-shot experience.

Sandra Webb, Betta Borelli, and Victoria Deneroff (College of Education)
Sustaining the STEM Professional Learning Community at Northeast High School: An Alternative Approach to Induction of New STEM Teachers
One essential quality of successful school and university partnerships is sensitivity to the complexities and challenges that schools face. This STEM mini-grant continues to sustain a STEM professional learning community at Northeast High School, a Title 1 high school, in Macon, GA. Title 1 high schools experience higher administrator and teacher turnover, impacting the human infrastructure of leadership and effective teaching. An intentional induction program based on lesson study was designed to address this challenge. Lesson study as an alternate approach to induction diminishes the hierarchical relationship of mentor and mentee by creating a learning community among new and experienced educators. The goals are to promote innovative and effective teachers, to support students in acquiring knowledge, skills, and dispositions for college and career success in STEM fields, and to develop STEM teacher leaders.
Marcela Chiorescu, Darin Mohr, and Brandon Samples (Mathematics)
Enhancing Student Learning Experience through Integration of Maple
There are many benefits for students from integrating Maple into mathematics classrooms: increased focus on conceptual knowledge, increased connections between multiple representations (algebraic and graphical) and the development of advanced mathematical thinking. The purpose of this project is to design Maple tutorials and projects that can be integrated into mathematics courses. These engaging activities will facilitate the use of a technology tool that not only will enrich their learning experience but also will prepare them for future careers in mathematics. We will present what we have done so far and provide some preliminary results for our project.

Jeanne Haslam (Center for Student Success)
Supplemental Instruction Leadership
Still relatively new on GC's campus, the Supplemental Instruction Program (SI) is making quite a contribution to our retention and course perseverance efforts. An excellent leadership opportunity, the SI program provides a comprehensive training and support system for our leaders who provide non-traditional, peer-facilitated study sessions in historically difficult courses. After a brief introduction to our SI Program and our results, SI Coaches and the SI Coordinator will lead a brief session with participants utilizing some of the collaborative learning techniques.
CALL FOR PROPOSALS

The STEM Mini-Grants Program is now accepting proposals for 2015-2016.

Awards for up to $7,000 are available for competitive STEM-related teaching innovation projects that target introductory STEM courses and STEM-focused K-16 learning communities.

Proposal requirements for 2015-2016 STEM Mini-Grants can be found at http://stem.gcsu.edu.

The submission deadline is April 20, 2015.

For more information, contact stem@gcsu.edu.
SPECIAL THANKS

USG STEM II Initiative

College of Arts and Sciences

John H. Lounsbury College of Education

J. Whitney Bunting College of Business

Office of the President

STEM Mini-Grant Proposal Review Panel

Department of Mathematics

ENGAGE

Center for Program Evaluation and Development

Science Education Center