Promoting University-wide Strategic, Cohesive STEM Education Outreach Programming

CSATS Mission

The Center for Science and the Schools (CSATS) at Penn State University works to develop and support mutually beneficial and sustainable relationships between Penn State STEM researchers and outreach providers, and K-12 schools that enhance K-12 science education across Pennsylvania.

STEM Education Outreach Model

Enhancing STEM literacy and interest by addressing outreach GOALS within a variety of outreach DOMAINS and DIMENSIONS

GOALS
- Methods of Science/Engineering
- Discourse and Practices of Science
- Scientific Thinking: Creativity, Critical Thinking, Problem Solving
- Nature of Science and Role in Society
- Global Awareness/Perspective
- Motivate/Interest/Excite in STEM

DIMENSIONS
- Formal/Informal Education (curricular, co-curricular, extra-curricular)
- Equity: Diversity/Underrepresented groups/Special Needs/ELL
- Urban, suburban, rural
- Discipline Areas: Individual STEM/Interdisciplinary STEM/Non-STEM
- Access: Face to face/Distance Learning/Blended
- Instructional Styles: Didactic/Demonstrations/Active engagement/Inquiry-based

Supporting and Enhancing Penn State STEM Education Outreach Efforts

Penn State has a rich tradition of STEM education outreach, reflected in the large number of outreach efforts across the STEM colleges and the variety of programs they provide. CSATS strives to support these efforts while promoting collaboration and leveraging of efforts. We support these goals by providing services and resources as described below.

Services
- Collaboration on K-12 STEM Education Grant Proposal Development and Project Implementation
- Information, Communication and Networking Opportunities
- Curriculum Development and Standards Alignment

Resources
- Curriculum Center (K-12 Curriculum & Science Education Resources)
- PSU STEM Outreach Database
- Commonwealth Campus/School District Outreach Database
- On-line Digital STEM Education Research Library

Building Trusting Relationships

Engaging teachers in professional development that enhances classroom teaching practice requires confidence on the part of school districts that programs will benefit teachers and students and will be flexible to accommodate school district constraints. CSATS works to build trusting relationships with:
- Districts to understanding their strategic plans to support reform-oriented science teaching.
- Penn State Commonwealth Campuses in order to help them provide balanced programming to school districts in their area.

Engaging in Research

CSATS also engages in research examining aspects of teacher-researcher partnerships that will inform future work and optimize benefits for each partner. This research includes:
- Understanding how researchers learn the skills needed to design and carry out a research plan.
- Identifying gaps in teacher understanding of this process.

One outcome of this research has been the Modeling Authentic Science, Technology, and Engineering Research (MASTER) model.

Modeling Authentic Science, Technology Science Research (MASTER) Model

The MASTER model provides a scaffold for helping researchers translate the complexities of their own funded research projects to teachers, who in turn use this scaffold to work with students to design and implement classroom research projects.

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