

RESEARCH INFRASTRUCTURE IMPROVEMENT (RII 4)
PROPOSAL DEVELOPMENT PROCESS

EDUCATION & OUTREACH WHITE PAPER

FOR DISCUSSION
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TITLE: CREATING A SUPPORTIVE EDUCATIONAL
ENVIRONMENT THROUGH PROFESSIONAL DEVELOPMENT

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Creating a Supportive Educational Environment Through Professional Development

A white paper for development of the New Mexico EPSCoR RII IV proposal

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Description

In their book “*Talking About Leaving: Why Undergraduates Leave the Sciences*” Seymour and Hewitt (1997) provide overwhelming evidence indicating that many students leave the sciences because they lose interest and are no longer motivated. Tobias (1990) indicates that students are not leaving because they are incapable of the conceptual learning needed to succeed in STEM but because students are not engaged. However, if STEM disciplines in New Mexico’s institutions of higher education want to increase student learning and consequently increase retention and graduation rates in STEM faculty have to work towards engaging their students.

Many factors contribute to the difficulty of developing effective STEM instructors at the college and university level. These include but are not limited to: 1) the lack of formal training in how to teach; 2) faculty workload; 3) lack of faculty rewards; 4) perceived lack of value in teaching; and 5) that research is more interesting and more valued at some institutions.

Therefore the purpose of this white paper is to develop a program through the EPSCoR RII IV project that provides Professional Development opportunities to EPSCoR Faculty and Graduate Students to increase current and future teaching skill levels, competencies and productivity. To accomplish this goal the objectives are to provide EPSCoR researchers and student participants with:

1. Training for a better understanding of what makes active-learning effective
2. Training needed to develop active-learning exercises useful for a broad population
3. Training and ongoing support to assure faculty and future faculty can overcome obstacles mentioned above
4. Training that allows faculty to expand their role to include outreach beyond the university
5. Training to better assess learning

Relevance to Energy, Water and Environment Nexus

The proposed professional development will focus on increasing competency and comfort with using problem-based, active learning strategies. Part of the development activities will include development and use of a menu of problem-based case studies and activities that address energy, water and environmental issues in New Mexico. By effectively using these active learning strategies to explore relevant, local issues, students and faculty can engage in meaningful STEM learning together. Through this effort NM EPSCoR institutions of higher education will increase STEM student retention, graduation, and placement of students in careers in the area of energy, water and environment nexus. These students will become the next generation of leaders and professionals to be proactive in developing our future energy resources through reacting, adapting and problem-solving in an increasing and ever-changing physical, economic, and social environment.

Target Audience

Faculty and Graduate students from New Mexico's Higher Education Institutions
Faculty from New Mexico's K-12 Institutions

References

Seymour, E., Hewitt, N. (1997). *Talking about leaving: Why undergraduates leave the sciences*. Boulder, CO: Westview.

Tobias, S. (1990). *They are not dumb. They're different. A new tier of talent for science*. Change 22: 11-30.