

The IDEAS* Institute: A Vehicle for Science Teacher Education and Outreach to Minority Communities

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*Institute for the Development of Education in the Advanced Sciences

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IDEAS has been assembled to provide a focus on cutting edge issues in science and technology, for the general public, local public and private school teachers and administrators, and college educators.



Professional Development in Science and Technology: k-12

- ▶ As part of its programming, IDEAS uses the partnerships and liaisons established through state and federal grant funded programs for minority teachers and students at Hofstra University to target minority districts on behalf of the professional development of the districts' K-12 science teachers.

Meeting Important Pre-conditions

- ▶ Have you established relationships with the district?
- ▶ Do your teachers understand what is meant by student engagement?
- ▶ Is there an appreciation of science in the daily life of the classroom?

Teacher Engagement

- ▶ IDEAS Workshops stress...
 - A greater emphasis on learning which is experiential and relevant to the world outside of school;
 - The significance of locating your own “scientific self” (Koch, 2005).
 - Making connections across disciplines: i.e. The MSP (NSF) partnership and connected math.

Student Engagement

- ▶ Engagement is the student's psychological investment in and effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote (National Research Council Institute of Medicine, 2004;).
- ▶ Teachers personally engage their students through the quality of their interactions.
- ▶ Students who are engaged in the learning process attend school more and learn more.

Sample Programming

- ▶ Science in the daily life of the classroom....
- ▶ Engaging students in a search for meaning;
- ▶ Using materials from daily life;
- ▶ Finding multiple ways to express meaning;
- ▶ Make connections to writing, design and construction.



Science activities that “work”



Materials are readily available



Teachers work together to solve problems



Looking at engineering design to enhance science and mathematics learning.



How can solving a Design Challenge enhance conceptual understanding of Mathematics and Science?

Placing science and math concepts in a real world context...

Design your ideal classroom – applying concepts of scale, ratio and proportion;

Design a model organism that could survive in the Arctic tundra.....

IDEAS sponsors one and two day geology field trips in New York State



Summer MST Institute

- ▶ An opportunity for teacher teams to intensively explore:
 - Problem solving
 - Inquiry
 - Design
 - Mathematical Analysis

 - ▶ Summer 2005:
 - First 2 weeks: July 5- 15
 - Third week for returning teachers:
July 18-22
- Five follow –up workshops during the 2005-6 school year.

The In-Service Model

- ▶ Implement intensive problem solving and design investigations with teacher during week one- look at science and mathematics concepts through problem solving and design.
- ▶ During week two, grades 4-7 students join teacher participants in the mornings to engage in problem-based activities.
- ▶ During the afternoons of week 2, teachers learn how they can customize this work to their grade level curriculums.



Participant Voices

- ▶ This was an amazing example of teachers as learners; thank you IDEAS for supporting educators like Donna and Kathy.
- ▶ Great program- excellent presenters-thank you for making it possible.
- ▶ I learned so much that I want to apply in my own classroom- where do I begin? The networking was equally important- I look forward to the follow-ups.
- ▶ As far as professional development goes, this is by far the most effective and inspirational! Thank you
- ▶ This institute opened my eyes to better methods of teaching which will enable my students to become better learners; Donna Migdol and Kathy Chapman are beyond comparison.

Working effectively takes time...

- ▶ It is not about the program- it is about the people...
- ▶ What do we hope for?
- ▶ How will we measure success?
- ▶ We need more than a "workshop" for a day- we need ongoing communication and professional development...
- ▶ Our teachers return...that is our track record.