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Illinois State University Partnerships for Research in Science and Mathematics Education (PRISM) Project (www.gk12.ilstu.edu)

Mission statement

The program trains and supports graduate students in science and mathematics to provide resources for middle and high school students and teachers. Graduate fellows and classroom teachers form school-based teams that identify and address science, mathematics, and technology needs. The program addresses issues of scientific literacy, equity, and attitudes toward science and math among middle and high school students. It integrates research and teaching, as well as enhances teaching and curriculum selection/development skills for all participants through collaboration. Our goal is to increase the flow of science, math, and technology education information, by creating a 'learning web' connecting all participants. The participants will include professors in the natural sciences and mathematics, curriculum specialists, graduate student fellows science, math, and technology teachers, and their students, creating a new cohort of science professionals (former graduate fellows) who are educated about and sensitized to the needs of secondary science education. Our interrelated set of goals focus on applying inquiry-based teaching/learning methods to:

- Use the content knowledge and skills of graduate student fellows to increase scientific and mathematical literacy among middle and high school students.
- Enhance teacher professional development in science, mathematics, and technology.
- Enhance long-term partnerships between Illinois State University and local schools.

Essential program principles are:

Partnership – The importance of shared contributions. It is difficult to overestimate the importance of partnerships among scientists, mathematicians, and teachers for improving K-12 science and math education. Scientists and mathematicians provide detailed content knowledge, and experience in the application of scientific reasoning and knowledge to real-world problems. Teachers understand and practice the pedagogical techniques that are most effective in communicating content and process to a wide audience. Graduate fellows can provide applicable content information for teachers and enhance hands-on curriculum in the classroom, and become long-term advocates for better science, math, and technology education.

The inquiry process as a basic approach to student learning. Both national and state learning standards address the significance of student development of critical thinking skills at all grade levels. A fundamental principle of our program will be the modeling of the guided inquiry approach to teaching, where students are presented with information and given a problem to solve. This approach, which is applicable to a variety of classroom environments and teaching styles, is based on our best understanding of how students develop knowledge.

Reflective teaching practices. Continuing reflection on classroom experiences and teaching practices is a universal practice of excellent teachers. Self-evaluation allows the practitioner to contemplate and assess the success of their skills. Participants can perform action research projects in their classrooms, providing a qualitative, reflective, and experiential approach to educational research designed to help teachers study their classroom practices.

Equitable delivery of education to all students. We believe that an investigation-based approach to learning is one of the most appropriate means to achieve educational equity for middle and high school students.

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