Project Description

The University of Delaware and the New Castle County Vocational Technical School District have initiated a GK-12 partnership in which nine UDEL graduate students in the sciences are selected annually to serve as Fellows. Fellows have been paired with high school science teachers, and these pairs, along with the Ph.D. of this program, have formed a learning community focused on reasoning and reflecting on teaching strategies. The goals of this partnership are to improve critical needs in teaching science in vocational/technical high schools. During summer workshops and in follow-up meetings facilitated by the Ph.D., the Fellows have been introduced to innovative teaching strategies including problem-based learning and co-teaching. Fellows have been provided with opportunities to observe high school science classes and to help design these classes. In addition, Fellows have access to a variety of resources for improving teaching science in vocational/technical high schools. Furthermore, Fellows have grown in their ability to communicate scientific understandings to an audience with multiple and diverse learning needs.

http://www.udel.edu/GK-12/

Lesson Study

Lesson study is a Japanese approach to instructional improvement. It is a cycle in which teachers work together:

1. To consider their long-term goals for students,
2. To bring these goals to life in research lessons,
3. To study and analyze these research lessons and others gathering evidence on student learning and development,
4. Collaboratively observe, discuss, and refine the lessons,
5. To teach the revised lesson in another classroom to study and improve it again.

Project Highlights

Lesson Study

Objective:

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2. To bring these goals to life in research lessons,
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Participants:

Katie Skakal, Richard Donkers, Ralph May, Carol Baxwell, Tami Leshner, Free Smart

Group developed, taught observed, and evaluated a research lesson on Global Climate Change and Alternative Energy Sources and Fuels. The lesson was co-taught over a period of three days in block scheduling. One member of the group taught the lesson while other group members observed student learning and made detailed records of their observations. Lessons were also videotaped for future analysis.

The group is now focusing on developing quantitative teaching skills and has discussed with the Math department. The goals for the lesson study group for the upcoming semester are:

1. Increase classroom research and reflective practice.
2. Begin development of peer-reviewed lesson which can be shared.
3. Create lesson for collaborative work.
4. Increase communication between Math and Science.
5. Increase student understanding of quantitative reasoning skills (i.e., graphical interpretation, equation manipulation).

Project Highlights

Incorporating Research

A teacher/fellow pair at Delaware has developed a web-based seminar long activity which integrates the future’s research on the physical science curriculum with the Delaware State Standards. Students will

1. Conduct their own research on an aspect of the project to determine the impact of research on the population of the country
2. Conduct an activity to create a resource group through a web page that they can use to upload images and research.
3. Integrate their research into a poster.
4. Evaluate posters in a poster presentation session at the end of the semester.

Project Evaluation

The project evaluation includes student assessment data and the Student Evaluation and Assessment Center for the College of Arts and Sciences. This data will serve as the essential evaluator for the project. The Center supports the standards of these evaluation activities and guides program development. The primary output of the Student Evaluation and Assessment Center is to develop a comprehensive annual program report that provides an overview of the program's activities and achievements, highlighting key goals and outcomes. This report helps in the development of future plans and the improvement of the program. The evaluation also includes feedback from the students on their learning experiences through detailed surveys and regular evaluations of the program's educational activities.

1. To evaluate the academic and career development of students throughout their academic program.
2. To track the progress made by students in their learning outcomes and areas of improvement.
3. To provide a comprehensive overview of the academic program and its impact on student success.
4. To identify areas where additional support and resources are needed for students.
5. To assess the effectiveness of the program in preparing students for future careers.

Funding Agency

National Science Foundation, Division of Graduate Education

Graduate Teaching Fellows in K-12 Education (GK-12)