



Abstract

Student-centered learning allows the instructor to act as a facilitator of learning, as opposed to a lecturer. The study was conducted in a 9th grade Living Environment class at a Brooklyn High School. In order to provide students with individual attention, students organized themselves into five groups, each researching aspects of their living environment. Students chose their research project, designed an experiment, collected and analyzed data, and were responsible for communicating their findings through frequent Power Point presentations to the class. Students were most engaged in topics that were more relevant to their community; and were able to apply the Scientific Method to their research projects. In addition, the class used mapping tools such as Google Earth, Google Maps, and MyWorld GIS to map their data and correlate it to health problems in their community. This research experience allowed the students to see connections between issues affecting them, their family and their neighborhoods. The students became environmental stewards in their communities, promoting more sustainable living, healthy habits, and petitioning the government to do the same. By using this approach, students remained engaged and active participants in their class, taking ownership of their education.

Introduction



Source: http://www.nsfgk12.org/nsf_gk12_program.php

GK-12 is an NSF program designed to support graduate students majoring in science, technology, engineering or mathematics (STEM) by providing them with funding, research assistance and valuable teaching experience. The graduate students are provided with invaluable learning tools during the workshops and are given multiple opportunities to present their research at national conferences. By allowing the graduate students to educate K-12 students, they are able to communicate science ideas to a wide range of audience members, which can serve as excellent practice for future conference presentations and possible academic career.

By promoting science related research in K-12 classes, students become involved in scientific research early on and have the opportunity to perform a collegiate level experiment and present their data at multiple conferences. GK-12 chapters are located all over the United States. The authors of this poster represent the Brooklyn College chapter, located in Brooklyn, NY.

Implementation of Student-Centered Environmental Science Research in a High School Setting

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Educational Approach

Place-Based Learning (Gruenewald, 2003)

- Community
- Multidisciplinary
- Student Engagement
- Relevancy

Inquiry-Based Learning (Ram, 1999)

- Student centered projects
- Authentic problem solving experience
- Ownership of the project
- Commitment
- Better understanding of the Scientific Method
- Interest in science

Brownsville, NY

- High Crime Rate
- Poor Overall Health
- Lack of Sufficient Healthy Food Choices
- High Percentage of Poverty
- Below Average Education

Teachers Preparatory School

>450 students from surrounding neighborhoods

•High proportion of minority students (~97%)

• Science-oriented classes and activities







What is our Living Environment?

• Place-Based Learning projects:

- Air Quality in Brownsville
- Water Quality in Brownsville
- Community health and health awareness
- Community eating habits and awareness
- Crime rates and awareness

• Inquiry-Based Techniques:

- Case-studies to form theories/hypotheses
- Freedom to choose and design a project
- Encouragement rather than lecture

•Milestones

- Power Point presentations to the classmates
- Conference presentations
- 2nd Place among Brooklyn high schools (last year)
- Increased college interest
- Enhanced science interest and understanding

community involvement

• Inquiry-based learning projects promote motivation and dedication to the project and increase overall understanding of the project while promoting a sense of ownership

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Gruenewald, D. A. (2003). The Best of Both Worlds: A Critical Pedagogy of Place. Educational Researcher, 32, 3-12.

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Projects





• Increased community involvement and stewardship (letters to politicians)

Discussion

• Place-based learning projects promote student interest and

Acknowledgements

References