

Work in Progress: The relationship between energy education and energy literacy - the potential benefit of reaching a high level of educational rigor and relevance

Contribution

Effective energy education programs will improve energy literacy among today's students, who will be the voters, consumers and professionals of tomorrow. The overall objective of this research is to evaluate different types of educational experiences in terms of their ability to improve students' energy literacy, which includes attitude and behavioral aspects. This research hypothesizes that energy education programs taught with greater emphasis on rigor and relevance will make greater strides toward improving students' energy literacy as compared with programs that do not emphasize these strategies.

Description

The project draws from our own research defining and benchmarking energy literacy and broader educational research showing the benefits of using a combined rigor and relevance framework. Rigorous teaching strategies improve students' higher level thinking skills by encouraging them to move from the lower levels (recall, comprehension) toward the higher levels (analysis, synthesis, evaluation) of Bloom's taxonomy. Strategies that emphasize relevance, such as project-based learning, issues and action training, and embedding scientific content within a societal context, help engage students by relating content matter to their own lives.

The research described in this paper extends our preliminary evaluation of the values of project-based learning to enhance energy education. The paper will describe current efforts to expand the research to a broader population with a rigorous study design to establish greater validity of the results. We will use a quasi-experimental, mixed methods design. Study participants will be selected from a database of 95 teachers who participated in a survey study in the Fall of 2008 that provided a benchmark of energy literacy among New York State students. Teachers for the extended study are currently being selected on the basis of their responses to two surveys related to their general teaching strategies and their approach to teaching energy-related topics. The goal is to select a sample of teachers that covers a range of teaching strategies as well as a variety of approaches to energy issues, in terms of topic breadth and depth. Selected teachers will be categorized into one of four quadrants on the rigor/relevance scale (L/L; L/H; H/L; H/H).

Students in selected classrooms will complete a combination of quantitative and qualitative survey instruments in May of 2009. The quantitative pre/post instrument is the Energy Literacy Survey that was developed and validated as an earlier part of this research. Qualitative surveys will include both closed and open items to provide a deeper understanding of the students' energy-related attitudes and their perceptions of the impact their education has had on their energy-related knowledge and behaviors.

Although data collection will be complete by October 2009, analysis will be underway. The paper and presentation will focus on the proposed data analysis strategies, which include an investigation of pre/post differences in quantitative survey results, quantitative analysis of self-perceived learning and behavioral impacts, and qualitative evaluation and summary of students' open-ended responses. Relationships between student outcomes and their teachers' position on

the rigor/relevance scale will improve our understanding of how the educational experience can help improve students' energy literacy.