

The Energy Literacy Assessment Project

Efforts to promote energy literacy – a citizenship understanding of energy that includes attitude and behavioral aspects – will help people make objective energy-related decisions and actions throughout their daily life. Effective energy education programs will improve energy literacy among today's students, who will be the voters, consumers and professionals of tomorrow. The objective of this research is to develop and apply a written survey to investigate the status of energy literacy and the potential for improvement among middle and high school youth. A survey that is broad yet suitable for classroom administration will be useful for developing and implementing effective energy education programs.

The Energy Literacy Survey has been developed according to established psychometric principles and methodologies in the sociological and educational sciences, beginning with the development of a conceptual definition of energy literacy that includes general characteristics as well as measurable benchmarks within three themes: knowledge, attitudes, self-efficacy, and behavior/intentions. Suitable benchmarks identified within each theme provide the basis for selecting or developing specific survey items/questions. A review panel of energy education specialists has helped establish construct and content validity by reviewing the characteristics, benchmarks, and survey items.

Two rounds of pilot testing among some 1655 New York State middle and high school students have resulted in a written survey that contains a set of questions that request demographic information as well as some self-assessment of energy-related knowledge and exposure at home, followed by an attitude subscale (17 questions), behavior/intention subscale (10 questions) and knowledge subscale (30, MS, and 38, HS questions). Knowledge questions used a 5-option multiple choice format; attitude and behavior subscales used a 5-point Likert-type summated rating scale ranging from strongly agree to strongly disagree. Internal consistency values of the pilot instrument, measured by Cronbach's alpha, range from 0.78 to 0.84 for the three subscales. Minimum alpha values for scales used in educational assessment are on the order of 0.60.

Overall results from the two rounds of pilot studies, using questions retained for the final instruments, indicate that the level of energy-related knowledge is lower than expected: among the whole-group, mean knowledge scores were 42%. Few students displayed broad energy-related knowledge, with only 4% of the students scoring over 80% on the knowledge subscale. Behavior scores were somewhat higher (mean 66%) and attitude scores were higher still, with a mean of 73%. These results suggest that students may be sympathetic to the energy problems we face, but lack the knowledge and skills to take effective action, demonstrating the need for improving energy education in our schools.

Current research (AY0809) uses the Energy Literacy Survey in an educational research study that will provide information about the energy literacy of a large number of middle and high school students throughout New York State (n=3650), and will also improve our understanding of the relationship between student gains in energy literacy and the type and amount of energy education they experience in the classroom.