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Case Study in Informal Evaluation of After School Stem (Science, Technology, Engineering, Mathematics) Programs for Girls

Authors : Marta Larson

Abstract : After-school STEM programs often intend to increase girls' interest in learning about science and technology but are challenged to demonstrate that their programs achieve this goal. This case study documents a successful effort in determining the outcome of an after-school club for girls in 7th and 8th grades (ages 12-14). Publicity about the club described it as "an afterschool club for girls interested in learning about science and technology. The girls will have the opportunity to start their own science project, just like real scientists! They will work in groups as companies developing a new product. They will learn about several different roles in the process including learning about the chemicals used; making, testing, and reformulating the product; and marketing the product. The goal of the project is to demonstrate how science applies in several career paths and to show what working in a science field is actually like. Girls will be working with faculty, staff, and students from (several area universities)." The club met after school once a week for 1.5 hours over the course of 8 months. Program objectives included enable a scalable replication of program, excite girls' interest in science in their everyday lives, dispel negative views of the scientific community, demonstrate that scientific careers are attainable for all, provide the deep knowledge and critical thinking skills necessary to pursue additional study of STEM fields, demonstrate that science doesn't happen in silos – it is a collaboration of content and people, and move students into pre-college programs at area universities (build the pipeline). Program evaluation included documenting the materials and process, program success, diversity effort, contribution to the girls' deep knowledge and critical thinking skills, effect on girls' interest in science, effect on negative views of the scientific community, demonstration that scientific careers are for all, and whether the girls learned that science requires working with others. Science interest means were different across duration levels. Students who attended the program for a longer period of time had higher science interest/engagement scores. Findings were significant ($p<0.001$). Given the small number of students involved a substantial opportunity exists for future research to validate these findings with larger groups.

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