



Tech-Explorer: Engaging Students in Science, Technology, Engineering, and Math (STEM) Education and Careers

The Sierra College Tech-Explorer catapult project is delivering to secondary school students mathematics curriculum integrated with an innovative project-based laboratory experience. Students use power and hand tools to make and assemble parts into a small catapult during school class time. Upon completion, students compete with their catapults. The project incorporates “just in time” mathematics coupled with a hands-on experience similar to what a manufacturing or repair technician might do on the job.

To strengthen student learning outcomes, the project is 1) creating two instructional modules to teach mathematics concepts integrated into making a catapult; 2) connecting the modules to California education content standards; 3) testing the modules at six high schools including evaluating the learning outcomes; and 4) delivering an in-service summer institute for teachers to gain knowledge of how to teach project-based learning.

The Tech-Explorer’s intellectual merit is in advancing understanding regarding the effectiveness of integrating academic concepts with hands-on projects as a means to increase motivation for learning and improve lesson comprehension. Additionally, the project provides students with an experience by which they can gauge their interest and aptitude in STEM education and careers.

Project outcomes and curricula are being disseminated to secondary and post secondary educators through the in-service summer institute. A searchable Internet database of applied academic lesson plans furthers project-based learning research and implementation, as well as widely disseminates project’s outcomes, resulting in a broader impact.

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