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Case Study: High School Girls Use PicoCrickets to Learn Programming Skills

Laura Enman, Program Coordinator at Techbridge has spent the last year working with 14 high school girls at Oakland Tech High School in Oakland, California, teaching them engineering and computer science principles. Techbridge is an after-school and summer program designed to encourage girls in technology, science, and engineering. Over the last school year, Laura spent an hour and a half one day a week with the girls, ages 14-18, studying circuitry, bridge building, soldering, toy design, "green" design (where girls got to build a model house using solar power and recyclable materials), and programming. The programming module used PicoCrickets, tiny computers that can make things spin, light up, and play music. The girls plugged lights, motors, sensors, and other devices into a PicoCricket, then programmed them to react, interact, and communicate.

Over the course of five weeks, Laura introduced the girls to computer programming through PicoCrickets. The first week, the girls got comfortable with the idea of programming by playing different ice breaker games that didn't immediately involve the computer. They would act out programming commands through a game of charades or play guessing games as to which commands did what. The next week, Laura introduced them to the software by directing them to put together simple commands and seeing what the outcomes were. In the following weeks, the girls came up with their idea of what a utopian community would consist of, then split into groups to work on animating the different components of their community. For example, some girls worked on creating a carousel made out of a motor and Dixie cups that would spin around. Other girls worked on creating model homes where lights and music turned on at the sound of clapping. By the end of the course, the girls were excited about the possibilities of computer programming and were no longer wary of their own abilities to program.

Techbridge had used LEGO Mindstorms ® Robotics Kits in the past, but found that they were not as easy to learn as the PicoCricket system, and that it took girls 5 months rather than 5 weeks to get comfortable with programming. Laura and her coworkers at Techbridge have found that PicoCrickets are not only easy to use, but provide the level of creativity that engages high school girls with engineering and computer programming. When Laura did a recruitment push to find girls for her program, she brought in a sample PicoCrickets project, a cake where the lights on the "candles" go out when you blow on them. This creative project inspired many girls to join the class. The rest of the girls came from the Oakland Tech Engineering Academy, or continued on from their participation in Techbridge programs from middle school.

In addition to the in-class projects, Techbridge also involves the girls in career exploration activities, such as role model field trips. The girls are taken to different companies and get to speak with real women in engineering or technology to dispel any stereotypes they may have of women in these fields.