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FEATURES

App Creation Inspires Student Entrepreneurs

After-school programs geared toward mobile-app development offer appealing ways to academically engage students in technical and entrepreneurial exercises

By Katie Ash

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Teams of girls in New York City, Los Angeles, and the San Francisco Bay Area spent 10 weeks designing a mobile app so they could pitch the final product at a national competition at the end of the course.

Students outside of Raleigh, N.C., learned different programming languages to create their own apps in a largely independent but rigorous after-school program.

And in the nation's capital students meet each week to learn not only how to make their own apps, but also how to hone leadership and entrepreneurial skills, such as marketing, creating a business plan, and public speaking.

A growing number of after-school programs for boys and girls that draw on students' interest in applications for mobile devices are evolving throughout the country. Such programs can be a gateway to learning computer programming, as well as business and marketing lessons, which educators believe equip students with lifelong skills to succeed in college and the workforce.

Some of the programs aim especially to engage girls.

"The reason we use app development is because girls are already pretty interested in their phones," says AnnaLise Hoopes, the director of educational and corporate partnerships for the San Francisco-based Technovation, which aims to promote the role of women in technology fields by teaching girls to create their own apps. "It's a very nonintimidating mode of computer science because it's something they can already relate to."

The program, which takes place in San Francisco; Mountain View, Calif.; Berkeley, Calif.; San Jose, Calif.; Boston; New York City; and Los Angeles, pairs up teams of five high school-age girls with female technology entrepreneurs as mentors.

In addition, the program brings in guest lecturers throughout the 10-week program to talk with the girls about opening their own businesses in the technology field.

"They tell [the girls] what challenges they faced, and they really share honestly about what it takes to get to a successful place. … It's inspiring for the girls," says Hoopes.

Since the program began in 2010, students have created such applications as the IOU app, which tracks borrowed money and other items; the Life Pyramid, which gathers data about exercise, sleep habits, and stress to help the user maintain a healthy lifestyle; and Tab Attack!, an app that helps users learn to play drums, guitar, and other instruments.

At the end of the course, the teams of girls compete in regional competitions, and the winners then go to a national competition called Pitch Night, where they present their apps to a panel of judges. The national winner's app gets professionally produced and is put on sale on Google Play.

"My hope is that they learn the process of creating a product and taking it to market just like they would as an adult entrepreneur," says Hoopes.

To pay for the program, Technovation partners with corporate technology sponsors in the local areas where the program operates. "Finding and securing these sponsorships is an ongoing challenge," Hoopes says.

"This year, we expanded significantly, and were able to work with twice as many new schools," she says. "Our goal was to target underrepresented minorities."

Girls in the Technovation program use App Inventor, created in 2009 by Massachusetts Institute of Technology professor Hal Abelson, who co-chairs the MIT Council on Educational Technology, in partnership with Google. The tool, which has since moved from Google to MIT, is a Web-based program that allows users with little programming experience to create mobile apps for Android devices.

Shaileen Pokress, a curriculum developer at MIT's Media Lab, which houses App Inventor, is now gathering support and curricular materials for the program. MIT will also create tutorials and support materials of its own to go along with the tool, she says.

Students in the Washington-based Youth APPLab also use App Inventor to create apps for Android devices.

Student Apps

IOU

Created as part of the Technovation challenge

Helps the user keep track of borrowed and lent items, such as money, books, clothes, and jewelry. A virtual caterpillar grows and shrinks depending on how reliable the user is.

Forage City

Created by the Mobile Action Lab

Helps users both locate and redistribute extra food from restaurants, food carts, and people's gardens to those who can use it.

Youth APPLab Book Pricer

Created by students at the Youth APPLab

Allows users to search for the lowest book prices on Amazon using the book's ISBN.

The Youth APPLab, which was created in 2010 after it won funding from the MacArthur Digital Media and Learning Competition, teaches students in the city how to create their own apps, as well as how to work together in teams and present their products in a professional manner, says Leshell Hatley, the creator of the program.

About 75 percent of participants have no prior programming experience, she says.

One such student is Afia Tyus, an 8th grader who helped build an app to teach the numbers one to 10 in English, French, and Spanish, and the **"Girl Crew App,"** which is designed "to encourage girls to embrace their individual and collective power," she says. It contains tips on doing well in school, links to homework help, and a reading list.

"These programs expand your view on careers like computer science and engineering and show the fun in them," Afia says.

Ninth grader Muhammad Hawkins credits Youth APPLab with giving him the entrepreneurial skills he needed to open his own app-development company with his brother, Hazma, also in the program.

The first year, a class of 25 students met twice a week to learn about technology—everything from piracy to programming, says Hatley, who runs Youth APPLab. Students received their own smartphones with texting and Internet capabilities to download and research apps. And in January 2011, they finally began working with App Inventor to design their own app prototypes.

Over the summer of 2011, Hatley hosted a course that focused more on the entrepreneurial side of launching apps.

Four of the students in her initial group have gone on to declare majors or minors in computer science in college, she says.

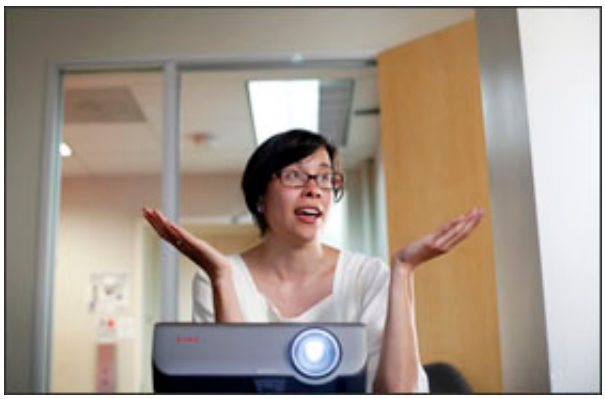
"We hope we're contributing to the future of the STEM fields [of science, technology, engineering, and math], the economy, and these students' lives," says Hatley. "Watching them grow has been amazing."

After-School Programming

In North Carolina, officials at Apex High School near Raleigh, opened an after-school app-programming course in February 2012 for students in the school's 335-student Academy of Information Technology, which spans grades 9-12. The course is a partnership with the Morrisville, N.C., technology company Lenovo and the New York City-based National Academy Foundation, a college- and career-prep nonprofit group.

Lenovo donated 30 Wi-Fi-enabled Thinkpad tablets, six touch-screen computers, a projector, and a cart for the tablets for the course. Lenovo also provided a course in app programming from Carnegie Mellon University, in Pittsburgh, for the students and a timeline of where they should be to help them stay on track.

When the course was first announced, Julie Oster, the director of the school's Academy of Information Technology, was pleasantly surprised by the amount of response from students. About 70 students signed up to take part in the after-school course, on top of their normal schoolwork and extracurricular activities.



Teresa Chin teaches her students about design as part of their mobile-app class.
—Sarah Rice for Digital Directions

Students were split into groups of four, with Oster making sure to include at least one student with programming experience to serve as a "technical lead." (Juniors and seniors in the Academy of Information Technology have experience with programming language.)

And while each team has a teacher mentor, "we were really counting on students to take the lead," says Oster. Students set up their own meetings and work through the curriculum independently, with support from a teacher mentor.

Mary Silliman, a junior at Apex High, is participating in the program.

"I thought it was a really interesting opportunity and really exciting to be able to use different technology," she says. Although Silliman has used programming languages before, this is her first time learning Java.

Her team's app allows students at her school to keep track of sporting events and create tournament brackets out of them.

John Boezeman is also a junior in the program. Boezeman had already taught himself to make apps before the course was offered, he says, but he wanted to get involved to develop more experience working on a team.

"The biggest thing [I've learned] is working with groups because, like I said, I already have experience with the app part, but I typically work by myself," he says.

Learning the marketing aspect of app development is also new to him, he says.

Both Silliman and Boezeman noted that one of the hardest parts of the creation process was identifying a good app idea.

"There's so many things you can do, and so many ideas, but you have to pick something that's feasible in the timeline but is also kind of unique," says Boezeman.

In addition, staying motivated and working as independent groups outside school has been a challenge, Boezeman says. "You have to take your own initiative," he says.

'Scream Machine'

Ray Shaik is the founder and executive director of the Oklahoma City-based **TechJOYnt**, an after-school STEAM (science, technology, engineering, arts, and mathematics) education program that has just begun offering classes on creating apps. Partnering with schools, school libraries, businesses, and community centers in the area, the organization reaches out to youths ages 6 to 14.

Shaik's 12-year-old daughter, Ridah, recently took part in the app development class.

"We learned how to make an app called Scream Machine," she says. The app is used as an icebreaker with groups of children, she explains. Students take pictures of other students and record their screams. The app then mixes up the photos and the audio, and the students are supposed to match them back together.

"The hardest part is remembering the [programming] language and how we're supposed to do it," says Ridah, a 6th grader. "I don't actually know the language yet, but I'm picking it up bit by bit."

The Oakland, Calif.-based youth-media organization **Youth Radio** has also launched an app-creation track for young people.

In what is called the Mobile Action Lab, students use App Inventor to create apps. Elisabeth Soep, the research director and senior producer at Youth Radio, explains that participants in the Mobile Action Lab either create learning apps, which are meant to teach them the basics of app creation, or market-bound apps, which require significant time and resources to develop. The goal for market-bound apps is to push them out

Student Isiah Foster, 16, right, works with Elisabeth Soep, the head of the app lab, during a session about design at the Youth Radio offices in Oakland,

for sale to the general public.

Calif.
—Sarah Rice for Digital Directions

"Our model is really based on young people participating and driving every phase of the design and development," says Soep.

Participants, who range in age from 14 to 24, work with a team to do their own market research, develop an app idea, design and create the app, craft a business plan, and market the app to the community.

Sometimes, the Mobile Action Lab brings in outside help to produce the app professionally, says Soep.

Donta Jackson is a 17-year-old junior at McClymonds High School in Oakland who has worked with the lab for about a year.

"I've learned how to create apps," says Jackson. "I've also learned that phones aren't smart until we give them the functionalities that make them smart."

For now, the Mobile Action Lab hosts long-term internships, which youths are paid to participate in, as well as weeklong crash courses in app-making. To be selected as interns in the program, students first have to go through at least three classes at Youth Radio and an application process.

An app now on the market developed by the Mobile Action Lab is called Forage City. It alerts users to drop-off points where restaurants, farmers' markets, and ordinary citizens with overabundant gardens have left surplus food.

Turning Forage City, which started as one girl's project in her own neighborhood, into a citywide app presented many logistical and technical challenges for students, says Soep.

"We would not have been able to break through those barriers" without the input of all the members of the group, she says.

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