

# Code/Interactive Case Study

## About Tom O'Connell

- <https://codeinteractive.org/about-us/>
- Tom O'Connell is interim Executive Director of Code/Interactive and helped create the organization's PD program for teachers

### What he wanted to do

- Expose more students to CS education  
Help teachers educate many students in CS over the course of their careers
- Offer PD classes in basic subjects such as programming and web development
- Attract teachers without CS or STEM backgrounds to CS PD classes

### What he did

- Established Code/Interactive's first formal PD classes based on CS
- Expanded the classes to a full-year curriculum
- Scaled the impact of the classes by partnering with the New York City Department of Education
- Created an assessment resources library for CS educators

### What they accomplished

- CS PD programs scale to reach students in underserved communities
- Teachers from disciplines such as music and theater are adding CS to lessons
- Students are becoming more confident in their CS knowledge, and more likely to study CS



## At Code/Interactive, teachers learn how to empower students through computer science education

### About Tom O'Connell and Code/Interactive

Code/Interactive was founded in 2001 in the Bronx, New York, with the goal of breaking the poverty cycle for inner city youth and expanded its mission to include training educators and building inclusive computer science (CS) programs.

Tom O'Connell, interim Executive Director of Code/Interactive, is passionate about CS, using it to help close the "achievement gap," and the gap in skills among underserved students compared to more affluent students. During his time as a teacher in Brooklyn, N.Y., Tom partnered with Code/Interactive to bring app development workshops to students. These workshops led to the creation of Code/Interactive's first formal CS professional development (PD) program for teachers, allowing Tom to bring CS education to more schools beyond his own.

### Challenge

In 2013, while teaching physics and CS at Uncommon Collegiate Charter High School, Tom organized an app development workshop with Code/Interactive. Tom was inspired by his student's creativity and problem-solving skills gained through the app development workshop, however, many of the students could not continue learning CS because CS programs were not available in their schools.

In parallel, teachers in New York schools with no CS background had an increased interest in the subject and would greatly benefit from learning basic skills and understanding how to incorporate the curriculum into lesson plans. "That was the start of an idea to get teachers trained with the same kind of curriculum we were already using in student programs. When we train a teacher, they'll have a class of 30 students for that year, and for 30 years after that," says O'Connell.

## Solution

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O’Connell strongly believed that investing in PD could expand the reach of CS to more students. He applied for Google’s Educator PD grant in 2015 to create a PD program in web development and programming. After using the grants to train teachers in “Exploring Computer Science,” a yearlong introductory CS class for high school students, Code/Interactive began working with several school districts to bring the training to more teachers. “The Educator grants were the seed we needed to get programs started,” O’Connell says.

In 2017, Code/Interactive expanded their PD offerings to include stipends for CS Assessment Fellows who will curate the assessment resources. Their goal is to create an open-source library of K-12 assessment resources for teachers. The library will be featured on Code/Interactive’s website as well as the New York City Department of Education “Computer Science For All” website, which will increase NYC teachers’ access to quality resources that are needed for assessing students learning outcomes in CS.

As Code/Interactive continues to build its PD resources, the organization has been able to offer classes to more teachers. Their goal for the 2017-2018 school year is to train 600 teachers in NYC. “We’re constantly building upon the programs that we’ve created to make sure that we can amplify our efforts,” O’Connell says. In an end-of-year survey of students taught by educators that participated in CS PD at Code/Interactive, 74 percent of students said they were more likely to study CS and 96 percent said their teachers were effective at teaching the subject.

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— Tom O’Connell, interim Executive Director, Code/Interactive

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## Impact

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### Bringing CS education to underserved communities

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As more educators from non-STEM and non-CS specialists learn CS, they will play a crucial role in broadening access to CS training to all students, including those in underserved communities. For its PD programs, Code/Interactive seeks out teachers from schools where more than 70 percent of students receive free or reduced-price lunches and schools that do not have existing CS programs. This way, Code/Interactive ensures that it serves teachers who can launch these programs in communities that really need it. “These teachers are real pioneers,” O’Connell says. “In a world where students might not feel empowered to change anything about their schools, home lives, or economic situations, giving students power through technology feels like magic,” O’Connell says.



## Encouraging creativity and leadership among teachers

“We actively encourage teachers to educate administrators and counselors about computer science education, and to advocate for students to take computer science courses,” O’Connell says. Through their PD programs, non-traditional CS teachers are learning to integrate the basics of CS and computational thinking (CT) principles into their classrooms. For example, a theater teacher at New York’s Academy for Software Engineering (AFSE), a computer science focused high school, asked her students to build theater sets using Scratch, a visual based programming language.

## Giving students the confidence to solve challenges using CS

During one of Code/Interactive’s hackathons, a student created an app for inner-city students that shows the safest way to walk home from school. When teachers help students understand the relevance of CS to daily life, they are inspired to “become the creators of technology, not just the consumers,” says O’Connell.

## About Google’s CS PD Educator Grants

Google’s Educator PD grants provide funding and resources to equip and empower computer science (CS) teachers through professional development (PD) programs. Administered by a PD CS expert, each program has three key components of successful and sustainable CS PD:

- 1 Content developed and delivered to increase educators' knowledge of CS and computational thinking
- 2 Content co-created by educators and PD providers to meet local student and educator needs
- 3 Communities of practice, professional learning networks, or other educator resource groups that support teacher learning throughout the school year