Google CS[4]HS

Catrobat launches scalable platform, content and training

About the organization

- https://www.catrobat.org
- Non-profit initiative based at Graz University of Technology in Austria that aims to promote computational thinking skills among children in a fun and engaging way
- Creates free educational apps including Pocket Code, an Android app available on the Google Play store

What they wanted to do

- Expand the reach and comprehension of Pocket Code to teachers and students around the world

What they did

- Created a six-week online course that teaches students and teachers how to create their own games, interactive animations and apps using Pocket Code

What they accomplished

- Reached around 2,000 teachers through the online course, impacting thousands of children around the world
- Surpassed 500,000 downloads on the Google Play Store, providing fun and interactive computer science learning globally

Challenge

The need for workers with computer science (CS) and coding skills grew by four percent each year from 2006 to 2016, according to DigitalEurope, a European organization that represents the digital technology industry. Many educators are struggling to keep up with the demand for technical skills because they lack the training, content and technical resources to successfully teach CS skills in the classroom. Teachers who have little to no background in CS often feel intimidated by the prospect of teaching an entirely new curriculum and skillset.

Necessary hardware like desktop and laptop computers are often too expensive for many schools to afford — particularly in underserved regions in Europe, the Middle East and Africa. Experts estimate that Wi-Fi and mobile-connected devices will generate 68 percent of all internet traffic in 2017. As mobile devices surpass desktop computers as the primary way people access the internet worldwide, educators are exploring mobile devices as a solution to more expensive equipment.

> "Without the CS4HS award and Google's long-standing support, we wouldn't have had such a tremendous impact on the lives of so many kids all over the world."
>
> — Wolfgang Slany, founder of the Catrobat project and head of the Institute of Software Technology at Graz University of Technology

Solution

Catrobat founder Wolfgang Slany realized that students lacked a way to learn computational thinking skills in a fun, creative way on their personal mobile devices. He and his colleagues created the Pocket Code app, which uses a visual programming framework made up of building blocks to create games and animations directly on their Android tablets or smartphones.

In 2015, Catrobat secured Google CS4HS funding to create a free online course to teach students and teachers to use Pocket Code. The course includes instructional videos, tutorial flash cards and classroom activities. It helps teachers understand basic programming concepts such as statements, conditionals, loops, threads and hardware

Akademisches Gymnasium Graz Secondary School students use the vocabulary game they designed with Pocket Code. The game connects a tablet to a skateboard to manipulate student-generated artwork.

Google CS4HS

CS4HS funding enables computer science education experts to provide exemplary CS professional development for teachers. The funding focuses on three major growth areas for teacher professional development in computer science:

1. Facilitating the development and delivery of content that increases teachers' knowledge of computer science and computational thinking
2. Allowing educators to customize learning content to meet local needs and share best practices for engaging all students
3. Building of communities of practice that continue to support teacher learning throughout the school year

For more information on CS Professional Development, visit www.cs4hs.com and join our G+ Community.

---

connections. "We knew some teachers were already using Pocket Code, but we wanted to extend the reach of the app. As a non-profit organization staffed by volunteers, we can't travel to Russia or Spain to host a workshop, so we created this course instead," says Anja Petri, head of design at Catrobat.

Benefits

Reaching thousands of students and educators globally

Since Catrobat introduced the online course in 2016, around 2,000 teachers from more than six countries have participated. Not only are these teachers are using Pocket Code in their classrooms to teach students to code, they're also using Pocket Code's online resources to share classroom exercises and resources with other educators. So far, Pocket Code has been downloaded more than 275,000 times on the Google Play store. It has also been downloaded in app stores in other countries, raising the total number of downloads to over 500,000.

Making the skills needed to code accessible for all

Catrobat strives to make coding easy and affordable for everyone, including schools in developing countries. Pocket Code's online course is currently available in English and German, and provides teachers with simple classroom activities. "Students from one of my classes represent 17 nationalities, and I teach them to use Pocket Code to create language games and quizzes," says Magdalena Strauss, a fourth grade teacher at Akademisches Gymnasium Graz Secondary School in Graz, Austria who completed the online course.

Helping teachers show students that computer science is fun

Catrobat's free online course aims to empower educators to teach coding skills across a range of disciplines. Teachers and students use Pocket Code to create interactive games that encourage experimentation and and student-led project-based learning. "Students already enjoy playing games on their phones, so they look forward to using Pocket Code in class," says Strauss, whose students used Pocket Code to create apps combining language, arts, and CS to learn vocabulary in multiple languages, with unique programming functionalities and even their own illustrations.