

# Video game teaches kids how to code

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A screen shot for the video game. Credit: CodeSpells/ThoughtSTEM

Computer scientists at the University of California, San Diego have successfully funded on Kickstarter a new and improved version of CodeSpells, a first-person player game they developed that teaches players how to code.

The game's previous iteration, developed by UC San Diego computer science Ph.D. students Sarah Esper and Stephen Foster, has been in use in dozens of schools throughout the world for more than a year. The researchers have been using the game as a platform to learn about the best ways to teach children how to code. They have presented their

findings at a wide range of academic conferences, including the upcoming Koli Calling International Conference on Computing Education Research Nov. 20 to 23 in Koli, Finland.

In this latest paper, "CodeSpells: Bridging Educational Language Features with Industry-Standard Languages," the researchers demonstrate that after playing CodeSpells for either four hours over four weeks or 10 hours over seven days, children ages 8 to 12 were able to write code by hand in Java.

"It is the goal of CodeSpells to provide a rich experience of computer science education to students who may not have access to an educator," Esper said.

Researchers now want to make the game more attractive and more fun to play. But they need funds to improve the game's graphics and coding interface. Enter Kickstarter, where the project has already met its \$50,000 fundraising goal.

"We want the game to be educational, but our biggest goal is to make sure it's fun," Foster said.



Concept art for life magic spells within the CodeSpells game. Credit: CodeSpells/ThoughtSTEM

He and Esper have co-founded ThoughtSTEM, along with UC San Diego biochemistry Ph.D. student Lindsey Handley, to teach children ages 8 to 18 how to code, via onsite classes and video games, including CodeSpells and Minecraft.

In its previous iteration, CodeSpells sent [players](#) on quests, which helped them master spells, written in Java. This new version is more open-ended much like Minecraft—a so-called sandbox game. The players are wizards that can modify the world around them at will. They can build mountains and valleys, levitate objects and start fires. They do so by using Blockly, a visual programming language created by Google, or Javascript.

The hope is that players will come up with their own quests. Researchers also hope that as players tinker with the game, they'll come up with their own exciting spells and share those. The goal is to create a vibrant online community, much like the one that has developed around Minecraft.

The game will feature several modes out of the box, but players will be able to create their own modes too. They'll have the tools to create everything from modes to survive in the wilderness to modes to balance an eco-system. They can even create multi-player magic-based sports to play with their friends.

The game will feature four elements: earth, fire, water and air, which the players can manipulate via spells. So far, computer scientists have completed an early version of gameplay for earth magic. The Kickstarter

will fund the development of magic for fire, air and water, with an alpha version to be released on Christmas Day 2014, a beta version in June 2015, and the final copy of the game's creative mode to be released September 2015.

If the Kickstarter exceeds its \$50,000 goal, the game's multiplayer functions will be enhanced. In addition, the game will add a fifth element, Life, which would give wizards control over animals and plants within the game. That feature would be released in summer 2016. By early 2017, players would be able to create their own species and custom characters within the [game](#).

Rewards for the Kickstarter range from a digital copy of CodeSpells for a \$10 donation to access to district-wide licenses for CodeSpells in alpha and beta versions and computational thinking courses to a teacher at each school within a school district for a \$5,000 donation.

Provided by University of California - San Diego

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