

Study Finds Clues on How to Keep Kids Engaged with Educational Games ^[1]

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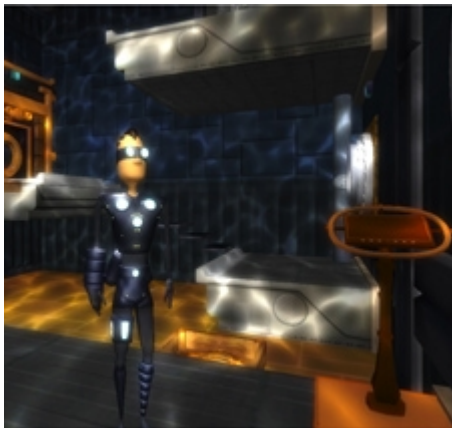
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Screenshot of the Engage game. Image credit: Kristy Boyer.

For Immediate Release

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If you want teams of students to stay engaged while playing educational games, you might want them to switch seats pretty often. That's one finding from a pilot study that evaluated how well middle school students were able to pay attention to game-based learning tasks.

Students at a Raleigh, N.C., middle school were divided into two-person teams for the pilot study. Researchers from North Carolina State University then had each team test gaming concepts for an educational game called "Engage," which allows only one student at a time to control gameplay. The researchers were trying to determine how effective educational gaming tasks were at teaching computer science concepts, but were also monitoring how engaged each student was.

The researchers found that, for each team, the student actively performing the game tasks was much more likely to stay engaged – but that the second student would often lose focus.

"This is a very useful finding, because we can use it to improve game design to better keep the attention of the 'navigator,' or second student," says Dr. Kristy Boyer, an assistant professor of computer science at NC State and co-author of a paper on the work. "For example, we could assign tasks to the navigator that are critical to team success and make sure that each student has an opportunity to take the controls during each gameplay session."

The pilot study is part of a larger effort by the researchers to develop a game-based curriculum that teaches middle school students about computer science principles ranging from programming and big data to encryption and security.

"We are doing this work to help ensure that Engage is a fun, effective learning environment, and to ensure that we can keep kids focused on the game itself," says Fernando Rodríguez, a Ph.D. student at NC State who is lead author of the paper. "Keeping kids' attention is essential if we want them to learn."

The paper, "Informing the Design of a Game-Based Learning Environment for Computer Science: A Pilot Study on Engagement and Collaborative Dialogue," will be presented July 13 at the International Conference on Artificial Intelligence in Education in Memphis, Tenn. The paper was co-authored by Natalie Kerby, an undergraduate at NC State. The research was supported by the National Science Foundation. The Engage development team also includes Dr. James Lester, professor of computer science at NC State; Dr. Eric Wiebe, a professor of science, technology, engineering and math education at NC State; and Dr. Bradford Mott, a research scientist at NC State.

Note to Editors: The study abstract follows.

“Informing the Design of a Game-Based Learning Environment for Computer Science: A Pilot Study on Engagement and Collaborative Dialogue”

Authors: Fernando J. Rodríguez, Natalie D. Kerby and Kristy Elizabeth Boyer, North Carolina State University

Presented: July 13, International Conference on Artificial Intelligence in Education, Memphis, Tenn.

Abstract: Game-based learning environments hold great promise for supporting computer science learning. The ENGAGE project is building a game-based learning environment for middle school computational thinking and computer science principles, situated within mathematics and science curricula. This paper reports on a pilot study of the ENGAGE curriculum and gameplay elements, in which pairs of middle school students collaborated to solve game-based computer science problems. Their collaborative behaviors and dialogue were recorded with video cameras. The analysis reported here focuses on nonverbal indicators of disengagement during the collaborative problem solving, and explores the dialogue moves used by a more engaged learner to repair a partner’s disengagement. Finally, we discuss the implications of these findings for designing a game-based learning environment that supports collaboration for computer science.

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