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Recommended Citation

College of Education, Georgia Southern University, "College of Education News" (2020). *Education, College of - News*. 253.

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Georgia Southern awarded almost \$300k grant, delivers computer science education to schools in Southeast Georgia

September 10, 2020



Mete Akcaoglu, Ph.D.

Growing up in Turkey, Georgia Southern University Associate Professor of Instructional Technology Mete Akcaoglu, Ph.D., was intrigued by video games but was only able to toy with the simple software of a friend's 8-bit home computer. Now, with the recent procurement of an almost \$300,000 National Science Foundation (NSF) grant, he's helping local students get access to game-based computer design instruction for career achievement.

"I didn't come from a rich country," said Akcaoglu. "So my exposure at a young age was limited to coding Hello World on the TV screen, but to date, that initial experience impacted my academic career, and with this grant, that's what I hope to do for children in Southeast Georgia."

The NSF's Computer Science for All program (CSforAll) awarded the funds for Akcaoglu's grant proposal, "Developing and Piloting a Game Design-Based Computer Science Curriculum," or "Project GAME," which outlines the delivery of computer science education using game-development software into four regional middle schools in Southeast Georgia.

Six teachers from Bulloch, Candler, Chatham and Screven Counties, are participants in the pilot program that kicked off in August. The teachers have started to receive professional development to use and operate Unity, a cross-platform game engine that can create virtual reality and augmented reality games, simulations and other cinematic experiences. Unity has been used to create notable games such as Battlestar Galactica Online, Assassin's Creed Identity, Call of Duty, Angry Birds Epic, and Rick and Morty: Virtual Rick-ality.

"Unity is an industry-standard software," explained Akcaoglu. "Many students are being introduced to block-based platforms nowadays. These tools are great to introduce young learners to coding and designing simple games. Children often do not realize they are engaging in coding while using block-based software. This fails to motivate them for future CS-related learning experiences or careers. However, with Unity, we will be able to engage in real-life coding, create complex games, and learn software that professionals are using and students will know that they are coding."

The challenge? The software can be intimidating to learn.

"That's where the grant team comes in," said Akcaoglu.

Co-principal investigators on the grant team include College of Education's Selçuk Doğan, Ph.D., assistant professor of curriculum and instruction, Charles Hodges, Ph.D., professor of instructional technology, and College of Engineering and Computing's Andrew Allen, assistant professor of computer science. The team of experts will create a professional learning community for the six participating teachers to learn the basics of the Unity software.



Selçuk Doğan, Ph.D.



Charles Hodges, Ph.D.



Andrew Allen, Ph.D.

“Over the next year, we will provide professional development so that the teachers are knowledgeable and comfortable to teach computer science via Unity in middle school classrooms during the connections and enrichment period,” said Dogan. “The software may be intimidating to learn on your own, and that is why we are doing it together as a community. We plan for both the teachers and students for this to be a rewarding experience where we start with small steps that participants can see their progress and celebrate.”

In fall 2021, the teachers will pilot the curriculum developed over the next year with their first group of students, focusing on middle school students in mostly rural areas. Schools included in the program include STEAM Academy of Statesboro, DeRenne Middle School in Savannah, Metter Middle School and Screven Middle School. Students will focus on basic game creation and coding and build their skills throughout the course. They will also have the opportunity to meet professional game developers who will share their experiences and advice with the students.

“The practical outcome of this research is that students will have learned the fundamentals of computer science and know that this knowledge is not out of their reach,” said Allen. “This knowledge can apply to any background to any field. The future is filled with computer science.”

Akcaoglu said the team is also making an effort to bridge the gap on the historic lack of women and minorities in the field by ensuring there is equal participation from girls and selective Title-1 schools.

“There is a theoretical background to our design for this project as well,” Hodges explained. “We are looking at self-efficacy and how to motivate everyone by making the curriculum and problem-solving opportunities relative to their lives and their backgrounds. We are also looking to provide team and pair programming opportunities where students can work with individuals that are of their own background to encourage and enjoy the process together.”

The two-year grant project will culminate with an event that will showcase the games that students created during the pilot program. Akcaoglu says he envisions a day of students and families coming together to play the games created by the middle schoolers and celebrate their hard work and achievement.

“Introducing students to computer science in this way during middle school allows them exposure to a possible career as a computer scientist and the vast opportunities that can bring,” said Akcaoglu. “While many of them may not choose to become a computer scientist, this will impact their thought process going forward and assist them in feeling comfortable approaching other coding and computer software that others would shy away from.”

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