USU Poised to Become National Leader in K-12 Computer Science Education | CEHS

10/16/2018

USU's Emma Eccles Jones College of Education and Human Services, ranked in the top 3% of colleges nationally by the *U.S. News and World Report,* recently received three grants totaling nearly $2 million focusing on computer science education. All three projects focus on elementary students, reflecting a commitment from USU researchers to bolster the chances of children to succeed in computer science and STEM fields starting at an early age.

As this subject is now recognized as an economic imperative across the nation, several states are establishing standards for students to develop computer science skills before they graduate high school. These grants from the National Science Foundation place USU as a frontrunner in the field of computer science education.

Each externally funded project stands to positively impact Utah students over the next several years and serves as a national model for K-12 computer science education. Collaborating in an interdisciplinary effort, professors from the School of Teacher Education and Leadership department and the Instructional Technology and Learning Sciences department are working together on these computer science education projects.

Dr. Jody Clarke-Midura, Dr. Victor Lee, and Dr. Jessica Shumway were awarded over $1 million to integrate computer science and mathematics learning in early childhood classrooms. The research team is interested in how children develop overlapping mathematics and computational thinking skills and how teachers can use screen-free coding toys during mathematics class. The goals of the project are to develop both curricula and assessments for computational thinking. According to Dr. Clarke-Midura, "There is very little research on what computational thinking looks like in early childhood education. This project will allow us to really understand not only what it means for young children to engage in computational thinking but also how they use math when they do."

A second grant, led by Dr. Colby Tofel-Grehl, Dr. Kristin Searle, and Dr. Andrea Hawkman, was awarded nearly $400,000 of funding to develop an electronic textiles curriculum for upper-elementary-aged children across the state. This grant will serve rural populations throughout the state, including large numbers of Native American students. "Students we work with are often located in extremely rural areas, which makes it difficult to access things many other school communities take for granted," said Dr. Tofel-Grehl. "E-textiles are uniquely capable of providing students opportunities to explore science concepts around energy while attempting to solve problems they encounter in their daily lives."

Finally, Dr. Victor Lee, Dr. Jody Clarke-Midura, and Dr. Mimi Recker obtained a $300,000 grant to work with elementary school classrooms and libraries to use board games and the Scratch programming environment to make computer science more approachable for elementary school students, and for girls in particular. "Board games are a way for kids to play with the formal rules of computing, without having to start with a computer," said Dr. Lee. The larger project will identify how youth can make the transition from thinking about code in easy-to-play board games to thinking about how to reproduce those games in a computer-coding environment.

"We are thrilled to receive this funding for our cutting-edge computer science education projects," said Dr. Beth Foley, dean of the Emma Eccles Jones College of Education and Human Services. "Our faculty members are exceptional in finding ways to serve the current and future needs of children, families, and schools in our community."