Overview

The University of Florida, Arizona State University, and CAST are partnering to propose a Level II Design and Development study to the teaching strand of the DRK12 program. Computer science (CS) education is quickly making its way into elementary classrooms, with little attention to the inclusion of students with disabilities. Their lack of inclusion occurs despite research showing that with accessible materials and effective instructional approaches, students with disabilities can meaningfully participate in CS education. Thus, the exclusion of students with disabilities from elementary CS education is a reflection of limited access and opportunity, not limited capacity. The aims of our project, **Collaborative Research: Teaching All Cs Through Inclusion and Collaboration with Special Education (TACTICS)** are to design, implement, and study professional development (PD) within the context of an online Community of Practice (CoP) for dyads of 4th or 5th grade general education teachers and the special educators working with them. This PD/CoP focuses on pedagogical practices that support elementary students with disabilities. This online PD/CoP will be developed through Design-Based Implementation Research (DBIR) cycles by a team of education researchers and practitioners. TACTICS PD/CoP is framed around the cyclical nature of teacher change within the Interconnected Model of Professional Growth (IMPG). It includes two-week cycles: (1) Reflect and Learn: asynchronous professional learning and synchronous deep-dive knowledge construction in areas such as Universal Design for Learning, High Leverage Practices, accommodations, and the role of paraeducators in CS education. (2) Reflect and Teach: collaborative planning, participation in a UDL/HLP video club, and technical support during teaching.

Intellectual Merit

This study aims to generate new knowledge about the impact of the TACTICS PD/CoP on elementary teachers' CS instructional practices as well as the learning and engagement of students with disabilities in 4th and 5th grade classrooms. This project will investigate ways to provide online, sustained professional learning to elementary and special education teacher dyads. It will also explore the roles of special education teachers as well as their assigned paraprofessionals in elementary CS instruction. Third, as an implementation study, this project will generate findings not only about whether the PD/CoP has impacted teachers' understanding of inclusive pedagogical practices, but also describe the ways in which the PD/CoP components translated to instructional practice and student learning, ability beliefs, and attitudes about CS. The project investigates both DBIR questions and efficacy questions. The overarching goal for TACTICS is to increase the level of meaningful engagement and learning of 4th and 5th grade students with disabilities CS education. To achieve this goal, we have five objectives: **(1)** Develop PD and a CoP for dyads of 4th and 5th grade general and special education teachers working to implement effective CS for learners with disabilities; (**2)** Gain an understanding about individual and contextual factors that promote or hinder effective inclusion of learners with disabilities in CS instruction; (**3)** Grow teacher dyads' confidence and instructional capacity for teaching CS to 4th and 5th grade students with disabilities; (**4)** Improve teachers dyads' knowledge and skills in implementing UDL and HLP-based CS instruction; and (**5)** Understand the relationship between teacher capacity in UDL and HLP-based CS education and student interest and self-efficacy for 4th and 5th grade students with disabilities in CS instruction.

Broader Impacts

This project will address a long-standing problem related to meeting the needs of learners with disabilities in CS education by developing novel ways of providing instructionally relevant PD within an engaging and responsive CoP to dyads of 4th or 5th grade teachers and the special education teachers with whom they work to build their capacity to teach CS to elementary students with disabilities. To increase the number of students with disabilities in CS education in the later grades, it is critical to provide positive early, sustained, and accessible experiences beginning in the earlier grades. A major way of achieving this goal is by providing both general and special education teachers with supports and job-embedded professional development in inclusive and accessible CS education. Thus, this project addresses the challenge of broadening participation to CS for students with disabilities who have been traditionally underrepresented in both CS as a profession and within K-12 CS education. In doing so, this project will also generate resources that can be broadly used and disseminated to support other elementary and special education teachers in their efforts to promote equitable CS learning environments. These resources will be available freely to all teachers through web resources.