

Developing Empathy and Persistence through Professional Development in New to CSA Teachers

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ABSTRACT

To meet the rising demand for computer science (CS) courses, K-12 educators need to be prepared to teach introductory concepts and skills in courses such as Computer Science Principles (CSP), which takes a breadth-first approach to CS and includes topics beyond programming such as data, impacts of computing, and networks. Educators are now also being asked to teach more advanced concepts in courses such as the College Board's Advanced Placement Computer Science A (CSA) course, which focuses on advanced programming using Java and includes topics such as objects, inheritance, arrays, and recursion. Traditional CSA curricula have not used content or pedagogy designed to engage a broad range of learners and support their success. Unlike CSP, which is attracting more underrepresented students to computing as it was designed, CSA continues to enroll mostly male, white, and Asian students [College Board 2019, Ericson 2020, Sax 2020]. In order to expand CS education opportunities, it is crucial that students have an engaging experience in CSA similar to CSP. Well-designed differentiated professional development (PD) that focuses on content and pedagogy is necessary to meet individual teacher needs, to successfully build teacher skills and confidence to teach CSA, and to improve engagement with students [Darling-Hammond 2017]. It is critical that as more CS opportunities and courses are developed, teachers remain engaged with their own learning in order to build their content knowledge and refine their teaching practice [CSTA 2020]. CSAwesome, developed and piloted in 2019, offers a College Board endorsed AP CSA curriculum and PD focused on supporting the transition of teachers and students from CSP to CSA. This poster presents preliminary findings aimed at exploring the supports and challenges new-to-CSA high school level educators face when transitioning from teaching an introductory, breadth-first course such as CSP to teaching the more challenging, programming-focused CSA course. Five teachers who completed the online CSAwesome summer 2020 PD completed interviews in spring 2021. The project employed an inductive coding scheme to analyze interview transcriptions and qualitative notes from teachers about their experiences learning, teaching, and implementing CSP and CSA curricula. Initial findings suggest that teachers' experience in the CSAwesome

PD may improve their confidence in teaching CSA, ability to effectively use inclusive teaching practices, ability to empathize with their students, problem-solving skills, and motivation to persist when faced with challenges and difficulties. Teachers noted how the CSAwesome PD provided them with a student perspective and increased feelings of empathy. Participants spoke about the implications of the COVID-19 pandemic on their own learning, student learning, and teaching style. Teachers enter the PD with many different backgrounds, CS experience levels, and strengths, however, new-to-CSA teachers require further PD on content and pedagogy to transition between CSP and CSA. Initial results suggest that the CSAwesome PD may have an impact on long-term teacher development as new-to-CSA teachers who participated indicated a positive impact on their teaching practices, ideologies, and pedagogies.

CCSCONCEPTS

• Social and professional topics → Professional topics; Computing education; K-12 education.

KEYWORDS

K-12 education, in-service education, professional development, pedagogy, AP Computer Science A

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