Teacher Self-efficacy During Professional Development for Game Design and Unity

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ABSTRACT

Teacher self-efficacy (SE) has been observed to be an "important construct for Computer Science (CS) teachers' professional development because it can predict both teaching behaviors as well as student outcomes" [1]. The purpose of the present study was to investigate teacher CS SE during a two-year federally funded professional development (PD) and curriculum development project for middle school teachers incorporating game-design and the Unity development platform. The research question investigated is: How does teacher self-efficacy for teaching computer science via game design with the Unity game development platform change during a year-long PD program?

Investigations of teacher SE for teaching CS have resulted in some surprising results. For example, it has been reported that "There were no differences in self-efficacy based on teachers' overall level of experience, despite previous findings that teacher self-efficacy is related to amount of experience" and "no differences in self-efficacy related to the teachers' own level of experience with CS" [2], thus further study of CS teacher SE is warranted. Participants in this study were six middle school teachers from four middle schools in the southeastern United States. They participated in a year-long PD program learning the Unity game development platform, elements of game design, and foundations of learner motivation. Guided reflective journaling was used to track the teachers' SE during the first year of the project. Teachers completed journal prompts at four intervals. Prompts consisted of questions like "How do you currently feel about your ability to facilitate student learning with Unity?" and "Are you confident that you can implement the materials the way the project team has planned for them to be implemented?" Prior to beginning the project participants expressed confidence in being able to facilitate student learning after participating in the planned professional development, but there was some uneasiness about learning and using Unity. From a SE perspective their responses make sense, as all of the participants are experienced teachers and should have confidence in their general ability to teach. However, since Unity is a new programming environment for all of the teachers, they did not have the prior experience necessary to have a high degree of confidence that they could successfully use it with their students.

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CCS CONCEPTS

Social and professional topics → **Professional topics** → Computing education → Computing education programs → Computer science education

KEYWORDS

Self-efficacy, game design, teacher professional development, Unity, guided reflective journaling

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