FACULTY RESEARCH FUND

Award Date: Spring 2017

Proposal Title: Computational Thinking and Mathematics – An Integrated Developmental Trajectory for Pre and Inservice Teachers.

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ABSTRACT

Computational thinking includes skills such as problem decomposition, pattern recognition, abstraction and generalization, algorithm design, and evaluation that are useful in both STEM and non-STEM disciplines. Indeed, CT is becoming increasingly important in a variety of fields because of the reliance of these disciplines on computational techniques for data collection, archiving, processing, and analysis, and it has even been conceptualized as a skill as fundamental as reading, writing and arithmetic [5, 13]. Developing computational thinking skills with in the K-12 grade environment have proven to be highly successful (CSTA, 2003: Fessakis & Mavroudi, 2013; Kafai & Burke, 2014; Kay & Knaack, 2005; Papert, 1991). Yet, throughout all the studies Very little, if any, research has been done on how to train pre-service teachers in non-computer science fields to use computational thinking in their classes. The purpose of this grant is to use a development approach to teach computational thinking in K-8 grade pre-service and in-service teachers through integrating number sense and geometry using computational thinking to study the effect the treatment has on pre-teachers' understanding, attitude and commitment to apply computational thinking. This initial study will be followed by an NSF grant to seamlessly ingrain CT in all generalist and/or middle school method courses.