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Authors

Booth, Julie

McGinn, Kelly

Young, Laura K

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MathByExample: Testing the Worked Example Principle in Elementary School Math

Julie Booth Ph.D.

Temple University, Philadelphia, Pennsylvania, United States

Kelly McGinn

Temple University, Philadelphia, Pennsylvania, United States

Laura K. Young

Temple University, Philadelphia, Pennsylvania, United States

Abstract

An abundance of empirical evidence has amassed supporting the effectiveness of having students explain why correct problem solutions are correct (Alevan & Koedinger, 2002; Hilbert, Renkl, Kessler, & Reiss, 2008) as well as why incorrect problem solutions are incorrect (Durkin & Rittle-Johnson, 2012; Grosse & Renkl, 2006). However, despite strong theoretical background for the approaches (e.g., Sweller, 1999; Siegler, 2002) and the growing amount of empirical evidence collected in real-world classrooms for students in middle school and above (e.g., Adams et al., 2014; Booth et al., 2015) it is yet unknown whether prompting self-explanation of correct and incorrect examples could be effectively translated for elementary school mathematics classroom. In this project, we worked with elementary school teachers and mathematics coaches to construct developmentally appropriate worked-example assignments for 4th graders; the present study tests the effectiveness of these collaboratively developed assignments for different topics in ethnically diverse 4th grade classrooms.