Using Personalized Data Tasks in College Algebra

Lauretta Garrett, Tuskegee University
Kelly Guest, Tuskegee University
David M. Shannon, Auburn University
Byunghoon Lee, Tuskegee University

Students’ struggles with understanding mathematics keep them from completing the courses they need to enter their desired professions (Attewell, Lavin, Domina, & Levey, 2006; Yantz, 2013). Teachers seeking to build conceptual understanding of mathematics in students can do so by fostering connections between different mathematical ideas through representations of those ideas (Mahir, 2009; Stylianou, Smith, & Kaput, 2005). Such representations may include not only traditional standard mathematics representations, such as tables, algebraic equations, and graphs, but also may include real-life settings with which students are personally connected. Our research examines the impact of personalized settings versus teacher selected settings for functions tasks in college algebra courses at the 2- and 4-year college setting. Pre- and posttest results show greater learning gains for students completing the personal data tasks. We provide examples of student work, discuss ways that students made connections between representations, and suggest ideas for extending the tasks to support other mathematical discussions.

Keywords: college algebra, personalized mathematics contexts, conceptual understanding, technology use in mathematics instruction

Lauretta Garrett received her PhD in mathematics education from Auburn University in August 2010. She has a bachelor’s degree in mathematics and a master’s degree in mathematics education. She regularly conducts action research into her teaching of precalculus algebra.

Kelly Guest has experience in teaching college algebra, the calculus sequence, calculus and probability for business majors, and mathematics for elementary education. She received her PhD in mathematics from Auburn University in August 2014.
David M. Shannon is Humana-Germany-Sherman distinguished professor in the department of Educational Foundations, Leadership, and Technology in the College of Education at Auburn University in Auburn, Alabama. He teaches courses in research methodology, and his research interests include program, teacher, and student evaluation.

Byunghoon Lee has experience in teaching college algebra, the calculus sequence, differential equations, complex analysis, and partial differential equations for mathematics and engineering majors. He received his PhD in mathematics from the University of Mississippi in May 2015.