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"Abstract Algebra Students' Function-Related Understanding and Activity" and "Participation in a Mathematical Modelling Competition as an Avenue for Increasing STEM Majors' Mathematics Self-Efficacy"

Texas State University
1:00 pm in DERR 227
February 22, 2019

Abstract Algebra Students' Function-Related Understanding and Activity

Kathleen Melhuish, Kristen Lew, Michael Hicks, and Sindura Subanemy Kandasamy

Abstract: Functions play a fundamental role both in abstract algebra and earlier courses in the mathematics curriculum. Yet little attention has been paid to how students' understanding of function (informed by their prior experiences) supports or constrains their activity when dealing with functions in abstract algebra. In this study, we report on six abstract algebra students' understanding of function, their function-activity in abstract algebra tasks, and the degree to which their understanding of function from prior experiences is connected to their understanding in this new setting. We conclude with two cases contrasting the activity of two students with divergent levels of connection between their function understanding and the abstract algebra setting. In general, we found that function served an important role in students' activity and provides implications for instruction and future research.

Participation in a Mathematical Modelling Competition as an Avenue for Increasing STEM Majors' Mathematics Self-Efficacy

Sindura Subanemy Kandasamy, Jennifer A Czocher, and Kathleen Melhuish

Abstract: Though scholars have long called for applications and modeling to be explicitly added to classroom agenda (Niss, Blum, & Galbraith, 2007), opportunities for undergraduates to engage in modeling in the classroom remain scarce. We report a study of undergraduate STEM majors engaging in authentic, open-ended modeling tasks using differential equations through a modeling competition. In this study, we propose a logic model that captures the relationship between the advantages of mathematical modelling and mathematics self-efficacy (MSE) and investigate the extent to which a mathematical modeling intervention increased STEM majors' Mathematics Self Efficacy (MSE).

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