

UTILIZING COGNITIVE INTERVIEWS TO IMPROVE ITEMS THAT MEASURE MATHEMATICAL KNOWLEDGE FOR TEACHING COMMUNITY COLLEGE ALGEBRA

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Cognitive interviews are an important qualitative method used by researchers to discern interviewees' understanding of survey items (Willis, 2005). As part of a larger project that is developing an instrument to measure mathematical knowledge for teaching algebra at community colleges, we conducted cognitive interviews to provide feedback for the development of items for an instrument that will measure mathematical knowledge for teaching community college algebra (MKT-CCA). We hypothesized the measure of MKT-CCA consists of two main constructs, Tasks of Teaching (*Choosing Problems* and *Understanding Student Work*; Ko & Herbst, 2020) and Function Types (*linear, exponential, and rational functions*; foundational for mathematical work in later classes). We proposed items to assess the six resulting dimensions. The interviews were designed to determine whether the participants interpreted the items as intended and whether they used the anticipated knowledge.

A purposive sample of 12 College Algebra instructors was selected from a stratified sample of 1,386 instructors in 199 community colleges in the United States. Collectively the instructors responded to 36 items (6 per dimension); each item was answered by two instructors. Conrad and Blair's (1996) cognitive coding scheme guided the analysis. Each interviewee response per item was the unit of analysis. We found that most participants understood the intent of the items but in a few instances participants selected the correct answer without using anticipated knowledge and that some items focused on multiple mathematical ideas. In addition, the mathematical language used in some items was unclear or unfamiliar, and real-world contexts, both realistic and unrealistic, distracted respondents from focusing on the mathematical content of the item. In the presentation, additional results will be discussed.

References

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