

Using the Iterative Visualization Thinking Cycle to Analyze Preservice Teacher Responses

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Abstract

The Iterative Visualisation Thinking Cycle is a useful analysis tool when looking at participant responses to visually-based questions, especially in mathematics. In this research, 45 preservice teachers, in their final year of study, were the participants in the qualitative, interpretivist study. All final year mathematics student volunteers had to complete a Google Form questionnaire online prior to the commencement of their pedagogical content knowledge module in geometry. Based on the quality of their responses, five participants were chosen for a one-to-one semi structured interview. The findings indicate that the participants, despite having twelve years of schooling, and three and a half years of tertiary education, cannot engage in simple geometry because of visual uncertainties. Many answered questions incorrectly, whilst some did not answer particular questions, choosing to leaving a blank response. The blank responses indicated the complete absence of critical knowledge required for both understanding and teaching. An attempt to get them to reflect on 'how' they thought about what they were doing whilst engaging with the problems, revealed tenuous links between their *a priori* knowledge and the concepts being tested. Commognition was also used to understand how these participants though the process of answering these geometry questions.

Keywords: commognition, geometry, meaning-making, mediators, visualisation