

SIGMAA on RUME 2011 Proposal
Contributed Research Report

Designing and Implementing a Limit Diagnostic Tool

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Abstract:

The purpose of this study is to create and utilize a tool that evaluates students' comprehension of the logical structure and implications of the formal definition of limit. This study continues the trajectory of recent limit research involving classroom-based interventions that reveal student metaphors and conceptions (Boester, 2010; Oehrtman, 2009; Roh, 2008, 2010). The diagnostic tool, based on seven concepts embedded in the formal definition, uses a set of delta/epsilon diagrams that students must explain, either accepting them as correct, or augmenting them to make them correct. The assessment was used after giving students in a conceptually-based calculus class a problem meant to introduce the logical structure of the formal definition. While students did not spontaneously show many of the concepts based on the problem alone, an interview protocol following the assessment prompted the students to rethink the implications of the problem, thus promoting the missing concepts.

Keywords: calculus, limit, assessment, conceptual decomposition