Guided Reinvention of Sequence Convergence: A Study of Two Students

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Abstract: In this talk, I will discuss how a pair of calculus students developed a rigorous formal definition for the limit of a sequence during a 5-day guided reinvention teaching experiment. The experiment involved an iterative refinement process during which the pair created a definition, evaluated their definition against examples and non-examples, acknowledged a problem(s) with their current definition, discussed potential solutions, and attempted to incorporate a solution(s) into a new definition, thereby restarting another iteration. Although neither student had received prior instruction on formal limit definitions, they were able to reinvent definitions consistent with formal theory. Specifically, this talk explores the emergence of quantitative reasoning about terms, errors, and error bounds in students’ definitions.

Dr. Beth Cory received a B.S. in Mathematics from Liberty University, an M.S. in Mathematics from Florida State University, and a Ph.D. in Mathematics Education from the University of Virginia. Currently, she is an associate professor in the Mathematics & Statistics Department at Sam Houston State University in Huntsville, Texas where she teaches mathematics content courses for elementary and middle school preservice teachers as well as graduate mathematics courses for the M.Ed. and M.A. programs. Her present research interests involve investigating students’ understanding of limit concepts in Calculus, the use of technology in the learning of mathematical limits, as well as the effectiveness of the flipped classroom.