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Beth Cory* (bcory@shsu.edu), Huntsville, TX 77340, and **Ken W. Smith**, Huntsville, TX 77340. *Using Dynamic Sketches to Help Calculus Students Develop and Integrate Coherent Mental Models of the Formal Definition of the Limit of a Sequence.*

The purpose of this research was to investigate the understanding of calculus students as they explored the formal epsilon-N definition of the limit of a sequence using interactive, dynamic sketches which embodied the formal definition. According to Theory of Multimedia Learning put forth by R.E. Mayer, learners construct two mental models as they learn a new concept: a visual model and a verbal model. A crucial step in learning occurs when students map elements of one model onto the other to create an integrated model. This presentation includes a demonstration of the sketches, created using The Geometers Sketchpad, and focuses on how the sketches and supporting activities were used to help calculus students develop an integrated model of the formal definition. Results indicated that the ability to manipulate the visual features of a sketch corresponding to key aspects of the verbal definition, in response to careful guidance, likely facilitated the processing necessary for students to develop coherent visual models of the definition and to connect it to formal symbolism. After developing their visual models in this way, many calculus students were able to construct a coherent symbolic definition on their own. (Received September 22, 2011)