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Teaching Leadership and
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A CONCEPTUAL APPROACH FOR TEACHING THE EPSILON-DELTA LIMIT
CONCEPT IN A SECONDARY CLASSROOM (247 PP.)

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This constructivist study was an attempt to research a unique pedagogical strategy in which the epsilon-delta limit concept is introduced prior to the informal limit notion through a competitive game between student pairs in which the rules of the game are based upon the epsilon-delta definition. Typically, the informal limit is introduced prior to the epsilon-delta definition, and this strategy has been documented to result in student misconceptions. Once the strategy was completed, the researcher attempted to: identify and understand what, if any, misconceptions students might construct; understand the nature of the constructions of the limit concept that students would make; see if students could use their constructions to accurately find limits of various functions. The teaching strategy only incorporated continuous and piece-wise linear functions.

The participants of this qualitative seven-day study were eleven volunteer students, six male and five female, from a suburban high school located in the Midwest who were part of an Algebra III class, a course taken prior to pre-calculus. Data were collected from written observational notes, audio- and video-tapes of all activities, and a written test administered on the last day of the study. Interviews were conducted prior to the introduction of the strategy, within a few days after the test, and approximately six to eight weeks after the test was given.

The competitive game was based upon the rules of the epsilon-delta concept in which, given a function and a point, one student was to choose an "epsilon" interval in

such a way as to challenge their opponent to find a corresponding " δ " that would prove that a limit existed. In this way, students "experienced" the epsilon-delta concept.

Results indicate that overall students accurately constructed the epsilon-delta concept with fewer misconceptions than documented in past studies. Students were also able to find limits at an 88% success rate.