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Inquiries into Student Understanding and Insights into Student Misunderstanding.

Students' (mis) understandings can be better explained in the context of mismatch between student 'concept images' and formal concept definition. Until a balance is maintained between these two constructs student understanding of a mathematical concept remains askew. A research was conducted to investigate how non math majors developed their mental models of various calculus concepts. Qualitative research methodology of teaching experiment was employed to collect data during the three-part research that consisted of two pre and post problem solving interviews; and a series of teaching episodes in the middle.

Data was collected based on pre and post problem solving interviews and a series of teaching episodes with small numbers of students. Students' oral and written artifacts were collected during the problem solving interviews. Students explained their thinking process and elaborated on the rationale for the pursuit of their selected problem solving techniques. Problem solution was studied and video-taped conversations and think alouds were explored. During the presentation students' concept images of asymptotes and limits as discovered during this research and the factors that influenced such concept images will be discussed. (Received September 26, 2017)