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This paper reports on an innovative approach to teaching calculus which is being used in large Calculus I and II classes in order to help students develop a deeper understanding of the critical concepts, resulting in improved ability to apply knowledge to novel situations. The treatment consists of voluntary oral reviews which take place before every written unit exam. Five students meet with a facilitator who asks them conceptual questions and requires them to defend their reasoning and negotiate meaning.

Students participating in 3 orals had average course grades nearly a letter grade higher than those of the control in both 2007 and 2008. Motivation measures indicate that motivation does not account for the differences seen. In both Fall 07/08, students were classified in four different ability groups as determined by a placement test that has been validated. Within each ability group, statistically significant differences were seen between students who took no orals and those who took three orals.

Mechanical Engineering introduced oral assessments in Spring 2009 and saw a 5% difference in the grades of those who did and did not participate in orals, and Aerospace Engineering has introduced orals into an introductory course this fall. (Received September 15, 2009)