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Judith Lynn Gieger* (lgieger@oglethorpe.edu), 4484 Peachtree Rd. NE, Atlanta, GA 30319, **John C. Nardo** (jnardo@oglethorpe.edu), 4484 Peachtree Rd. NE, Atlanta, GA 30319, **Karen L. Schmeichel** (kschmeichel@oglethorpe.edu), 4484 Peachtree Rd. NE, Atlanta, GA 30319, and **Leah R. Zinner** (lzinner@oglethorpe.edu), 4484 Peachtree Rd. NE, Atlanta, GA 30341. *A quantitative and qualitative comparison of homework structures in a multivariable calculus class.* Preliminary report.

The purpose of this study was to investigate the relative effectiveness of an online homework assessment structure in a multivariable calculus class. In previous semesters, this course utilized a traditional textbook homework assignment system, with occasional problems collected and graded by the professor. While this traditional structure was effective in providing students with feedback in preparation for exams, it was believed to be less effective in terms of enforcing regular daily practice of calculus skills. In the most recent semester, students completed homework problems using an online program that required them to continue to solve problems until they reached a specified level of mastery. We measured outcomes both quantitatively (pre- and post-semester surveys of student behaviors, motivations and attitudes; grade comparisons between the group currently enrolled in the course and a group enrolled in a previous semester) and qualitatively (focus groups with a semi-structured interview protocol and multiple coders). The results of this study (completed in December 2010) will be used to inform future decisions regarding homework structures, particularly as related to academic progress in the course as well as engagement with mathematical ideas. (Received September 22, 2010)