Using ALEKS Adaptive Learning Environment Platform to Enhance Students’ Learning in Precalculus Courses to Improve Performance in Undergraduate Mathematics Courses

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Summary

The purpose of this study is to improve students’ learning – both short-term during the semester of taking the course and long-term in their subsequent courses – by providing a continuous feedback and assessment in Precalculus courses. Courses in the Precalculus / Calculus sequence (followed by higher-level mathematics courses) heavily depend on previously learned material, and thus long-term retention of skills and knowledge learned in any of these courses is very important for overall improvement of undergraduate mathematics education at Georgia State University. Thus building strong foundation in Precalculus content and ensuring retention of the material learned in the course will help to better prepare our students for their following mathematics and other undergraduate courses. We propose conducting simultaneous pilots of this study in two sections of Precalculus starting Spring 2013 to evaluate student response to a supplemental adaptive learning and assessment system along with regular course material. The current college algebra course material is delivered via weekly breakout sessions and software which is modular, self-paced, and accessible anywhere with Web access. In addition to this software, ALEKS assessment system will help students ensure that topics learned are also retained. As a part of this study, data from student assessment track reports will be collected, organized and the quantitative data will be analyzed by using ANOVA and regression analysis. The results will be used to improve the current teaching and learning model and the research findings will be published in refereed journals and reported on conferences.