Using Data to Develop an Adaptive Syllabus for the PreCalculus Sequence at the College of Staten Island

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Target Course: College algebra and trigonometry (MTH123)

Intervention: adaptive syllabus based on students’ strengths and weaknesses

Abstract:
The central research question of this project was how a data-driven curriculum and data-driven faculty development can improve student learning and success. Approximately half of the sections of MTH 123 were included in the study in spring 2010 and fall 2010 and half were a control group. For all sections of these courses, the Mathematical Association of America (MAA) Maplesoft Placement tests were used to pre-test the students on the prerequisite topics of the course at the beginning of the semester and post-test the students on the topics they were supposed to have learned in the course at the end of the semester. In the sections chosen for the study, the instructors adopted an adaptive syllabus as opposed to the rigid one followed in the remaining sections of the course. The dependent variable of the study was the student success in the course as measured by the post-test data and the final grades. The "function" relating the independent variables and the dependent variable was "faculty development," more specifically the development of an adaptive, dynamic data-based syllabus by faculty for individual sections. The study was the quasi-experimental pre-test/post-test design. Although the outcome data did not clearly support the assertion that the adaptive syllabus is superior to the rigid one, the overwhelming consensus among the participating instructors is a testament to the usefulness of the pretests-posttest analysis, the faculty development meetings and the adaptive syllabus. The participating instructors developed a proactive as opposed to reactive approach to instruction; they paid attention to their students and exchanged ideas, resulting in a more “thoughtful” teaching style.