

An Evolving Flipped College Algebra Classroom

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Abstract

We provide the description of a college algebra course that was redesigned from a primarily traditional lecture-based course to a flipped classroom, and a statistical analysis of whether or not it improved grades and pass rates for that course. We include a description of the course before the redesign, motivation for the redesign, a description of the course after the redesign, the course materials used, outcomes including a statistical analysis of student grades and pass rates in the course over a period of eight years, and future plans for the course. The statistical analyses include two multiple regressions. The first regression provides the numeric grade in college algebra as a function of the factors: Aragon teaching the course, changes made by Aragon, changes made in placement starting fall 2012, changes made in spring 2014, math ACT score, and high school GPA. The second regression is a logistic regression using the same predictors, as was used for the first regression, as it affects passing the course. The authors reason that the redesigned course is an improvement over the lecture-based course, and that a well-designed flipped college algebra course shows promise of improving pass rates.



Regina Aragon presently serves as the chair of the Department of Mathematical Sciences, and as a professor of mathematics at Eastern New Mexico University, where she has taught since 1993 upon earning her PhD from the University of Colorado. Although Regina has published work in mathematical logic, her present research focuses on the teaching and learning of mathematics. During her tenure at ENMU, she has served as the administrator of grants such as the Mathematically Connected Communities at ENMU (2007–2010), which provided professional development opportunities for public school teachers, and the New Mexico Alliance for Minority Participation at ENMU (1994–2009).

Thomas Brown is a professor of computer science and assistant dean of the College of Liberal Arts at Eastern New Mexico University in Portales. Tom teaches courses in computer science, mathematics, and statistics and enjoys modeling, simulation and crunching institutional data. When Tom does not have his nose in a computer, he is spending time with his wife, Joan, and kids and watching documentaries on Netflix. Tom has been a New Mexico resident for 30 years and enjoys the mild weather, great food, and ethnic diversity of New Mexico.

