Predictors of Students' Achievement in a Blended Learning Course

Xingyu Zhou [1], Cindy (Xin) Chen [2], and Casey Smith [3]
Jennifer DeBoer [2]
[1] Department of Electrical and Computer Engineering, Purdue University
[2] Department of Engineering Education, Purdue University
[3] Department of Interdisciplinary Science, Purdue University

ABSTRACT

Massive Open Online Courses (MOOCs) have been at the center of media attention and hyperbole since 2012. Physics I: Classical Mechanics was a physics course offered by an elite private university in the northeastern United States in the fall of 2014. This course was offered in a blended learning format using a MOOC platform. There were 476 students enrolled in the course, but only 266 of them completed the course. In order to better understand the behavior and academic performance of students in this course, several mathematical models were used to examine the relationship between their grades and their use of the course materials. More specifically, the focus of this paper is the relationship between students' online problem checking behaviors for questions that required handwritten solutions and their academic performance in the course. All of the data comprising students' behaviors on the MITx platform are available as a "click stream" log of every action taken by each individual. Several mathematical models were used to create features describing these behavior patterns, and all of these features together were used to build a regression tree, which predicted students' academic achievement. The results from this model indicated that students who checked their answers more frequently generally received better grades on average. Moreover, students who had more interaction with course materials generally had higher average grades than those who interacted with the platform less. Results also indicated that the group of students whose last problem check was correct received better grades than the other group whose last problem check was not correct. The group of students who started to do the homework earlier in the week also received better grades. The results of this paper are going to help the instructor to build better course outlines and provide students more useful instructions to achieve better grades.

KEYWORDS

MOOCs, blended learning courses, higher education,