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The distribution and utilization of class time: How long should class be, and should students even attend?

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ABSTRACT

Previous research has examined a number of factors affecting student learning and academic performance, including attendance, prior GPA, and college entrance exam scores. This study seeks to expand the literature utilizing a data set for introductory macroeconomics classes at a public liberal arts college. The study introduces an important new variable to determine the role of class scheduling on student performance: the distribution of class time per week. Linear regression models yield anticipated directional results, with six of nine selected variables yielding statistically significant results and 57.3% of the variation in exam scores explained by the selected variables.

1. Introduction

Class time facilitates learning directly through lectures, discussions, and activities and indirectly through the guidance and motivation provided for learning outside the classroom. Consequently, one should be able to quantify the impact of class time on student learning and academic performance. Indeed, many studies have focused on the impact of one measure of a student's utilization of class time, attendance, but a student's physical presence is not the only factor affecting whether the student learns in or as a result of time in the classroom. The student's background, drive, and skill set all matter, as well as factors that can be influenced by the instructor, including the quality of teaching and the structure of the course. Accordingly, this study seeks to extend the literature on student learning by examining through regression analysis a number of factors like attendance and aptitude, as well as

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a variable that has not hereto been examined in the economics literature: the distribution of class time. Using a data set for introductory macroeconomics classes at a public liberal arts college, the study confirms the positive impact of attendance on student exam performance, but also finds that students perform better in classes that meet three times per week for 50 min each than in classes that meet two times per week for 75 min each.

A class may meet three times a week, two times a week for a longer duration each session, or some other variation. This distribution of class time is likely determined by the instructor, the department's schedule coordinator, or a university administrator based on instructor and department preferences and objectives, facility and other logistical constraints, and, perhaps, some perception of differences in student learning for various meeting times and durations. Do these perceptions have basis in reality, and if so, should special consideration be given to the impact of class scheduling on student learning? Although this issue has not been examined in the economics literature, it has been considered in the broader literature. For example, in a study of college algebra classes, Gallo and Odu (2009) find that students with no prior knowledge in the subject perform best in classes meeting three days per week, students with a minimal level of exposure perform best in classes meeting two days per week, and classes meeting only once per week perform the least well.

Based on the general literature in psychology and education on attention spans, one might expect that students learn more in shorter, more frequent classes. On the other hand, a student's attention "clock" may be frequently reset in dynamic classes, classes involving more than "time on (one) task". Beyond attention spans, the distribution of class time might affect learning through at least two other channels. First, the distribution of class time may affect how much or how often students study outside of class. Second, attendance rates may vary with the distribution of class time. Indeed, Devadoss and Foltz (1996) find a statistically higher attendance rate in classes meeting three days per week of 6.4% over classes meeting two days per week, though the authors of the present study could not duplicate this result for the data set introduced below.

Attendance itself is a measure of the utilization of class time and has been shown in many studies to affect student performance. Specifically, a high level of absenteeism has been found to accompany lower overall grades in courses (Durden and Ellis, 1995, 2003; Clauretie and Johnson, 1975; Moore, 1978; Park and Kerr, 1990) and lower performance on exams (Marburger, 2006; Romer, 1993). Costs of absenteeism are incurred not only by the student, but may result in additional work for peers and, as Brauer (1994) remarks, high costs for professors. Students that arrive to class late or fail to arrive at all disrupt the classroom atmosphere, creating uncomfortable and tiresome environments for those students who sincerely wish to learn and causing undue stress for professors who must then spend already scarce time re-teaching students who may have little interest in the subject (Brauer, 1994).

To more fully understand the impact of the distribution and utilization of class time on student learning and performance, additional variables are included in our regression study based on intuition and an examination of the literature, including cumulative prior grade point average (GPA), the score for the college admissions SAT Reasoning Test (which was known as the Scholastic Aptitude Test prior to 2005), major or minor declaration, mathematical background, student-athlete status, and gender. A summary of the relevant findings and conclusions from the literature is provided in Table 1.

2. Data

The data set for the present study spans five years, 2004–2009, and comes from two different sources at a small public liberal arts university: a professor's records of attendance and exam scores for his introductory macroeconomics classes and the university's Office of Institutional Research. A mandatory attendance policy is in place for all classes, with attendance contributing a portion of the student's final grade for the course.[1] For the purpose of this study, the attendance variable is given as the percentage of total classes attended. Moreover, an unweighted exam average serves as the

[1] The attendance policy is such that a student may miss without penalty two to three classes in the semester (depending on whether or not the class meets two or three times a week). For the remaining classes, the student's attendance grade depends proportionally on the classes attended, with 85% attendance receiving an attendance grade of 85%. Moreover, the attendance grade constitutes between 8 and 12% of the student's overall course grade.