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THE EFFECT OF COMPUTER RELATED ASSIGNMENTS ON STUDENT PERFORMANCE IN BUSINESS ADMINISTRATION

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ABSTRACT

The purpose of this paper is to examine the effect of computer-related assignments on the performance of business and economics students

INTRODUCTION

During the last decade or two, the use of computers as an educational tool has increased dramatically. Almost every discipline is affected. The fields of economics and business are no exception.

The students in marketing or business policy courses apply some of the tools they learn to manage hypothetical firms in computer simulation games. Other software packages such as SAS, TSP, and SPSS provide timesaving tools for statistical studies. Business schools and Economics departments depend heavily on these packages for pedagogical purposes Henry et al., (1978). Teaching basic statistics, econometrics and forecasting would be significantly hampered without them.

Although no one can deny the value of using computers in reinforcing the classroom experience, it is not clear to what extent these tools improve student performance. The ramifications of this issue are significant. If there is no evidence that student performance improves with use of these tools, then there is no justification for evaluating students on the results of a computer-related game or project. If evidence indicates otherwise, the use of computers and various software should be emphasized and increased.

Methodology

It is clear that a student's performance in a course, as measured by grade, is a function of many variables. Some of these variables, such as SAT scores or cumulative CPA are quantitative. Other variables, such as attitude toward a class or subject matter and motivation level, are difficult to measure objectively. This study relies on statistical methods that require quantitative measurement of the variables. The study assumes that a student's cumulative CPA reflects some of the qualitative variables. This assumption imposes some limitations on the interpretation of the results but is not unrealistic. Data on student motivation levels and interest in the subject matter, are difficult to collect and are often unreliable for the purpose of statistical analysis.

The study is based on two sets of tests. first, the average grades of two groups of students are compared. One group actively used a statistical package or simulation game and the second group did not. The null and the alternative hypotheses to be tested are as follows:

$$\begin{aligned} H_0: AG_1 &= AG_2 \\ H_a: AG_1 &\neq AG_2 \end{aligned}$$

where AG_1 and AG_2 represent the average grades of the two groups, respectively. This is done by analysis of variance.

The second set of tests uses regression analysis. As discussed earlier, course grades are a function of several variables. This functional relationship can be expressed as follows:

$$G = f(CGPA, SAT, D) \quad (1)$$

where G is the grade in the class; $CGPA$ (cumulative grade point average) is used as a proxy for the level of student motivation and interest in college education due to lack of direct measures. The SAT (Scholastic Aptitude Test) is entered to reflect the level of student ability. Finally, D represents a dummy variable that takes on values of 1 and 0, depending on whether computer assignments were used in a class or not.

The following explicit functional forms are estimated:

$$G = \alpha + \beta CGPA + \gamma SAT + \psi D \quad (2)$$

$$G = \alpha + (\beta CGPA) + (\gamma SAT) + (\psi D) \quad (3)$$

The estimated coefficient of the dummy variable measures the sensitivity of a student's grade to the usage of computer-related assignments. The relevant null and alternative hypotheses to test its significance are as follows:

$$\begin{aligned} H_0: \psi &= 0 \\ H_a: \psi &\neq 0 \end{aligned}$$

If the test result indicates that the coefficient is positive and statistically significant, one concludes that the use of computer-related assignments has significant effect on student performance. Otherwise student performance is not affected by the use of computer-related assignments.

Data

The students in two different courses taught by the author comprise the necessary samples. The students in the Introduction to Economics course have participated in a computer-based simulation (Microsim by Gold et al.) since the fall semester of 1984. From Spring Semester, 1983 till Fall Semester, 1984 the business simulation game was not required. The sample for this part of the study consists of 97 students.

The second part of the data involves the users of the Time Series Processor (TSP) by Hall (1983), in the Managerial Economics course. Toward the end of each semester, (since fall 1983) teams of two students estimate a demand function for a product. The teams analyze the computer output for their particular data. In the analyses, students are expected to include various tests studied, such as, t-statistic, F-statistic, R^2 , and Durbin-Watson d-statistic. This exercise was not required during the Fall Semester, 1982 and Spring Semester, 1983. One hundred and thirty students from various semesters comprise the sample for this part of the study.

Summary of Results and Conclusion

The conclusion is that participation in computer-related projects appears to have no significant effect on student performance measured by course grade. Overall academic performance (measured by cumulative CPA upon entering the course) is consistently (in different samples) a significant determinant of a student's performance. To the extent that grades reflect student knowledge of the subject matter, student "knowledge" does not improve by using computer-related assignments. Therefore, these tools should be used as complementary vehicles to teach business and economics rather than substitutes for conventional methods.

Tables and references available upon request.