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The Effects of Attendance on Student Learning in Principles of Economics

By GAREY C. DURDEN AND LARRY V. ELLIS*

Does attendance affect performance in college economics courses? David Romer (1993) found that attendance did contribute significantly to the academic performance of students in a large intermediate macroeconomics course that he taught in the fall of 1990. (See the Summer 1994, *Journal of Economic Perspectives* [vol. 8, no. 3, pp. 205–15] for numerous comments on Romer.) This conclusion held even after controlling for student motivation which, it may be argued, is the true factor determining performance and is only approximated by attendance. An earlier study by Kang Park and Peter Kerr (1990) found that attendance was a determinant of student performance in a money and banking course, but not as important as a student's GPA and the percentile rank on a college entrance exam. A study by Robert Schmidt (1983) reported that time spent attending lectures contributed positively to performance in a macroeconomic Principles course.

On the other side of the ledger is evidence from Neil Browne et al. (1991) showing that students who did not attend a typically structured class with lectures did just as well on the Test of Understanding College Economics (TUCE) as those students who attended a standard microeconomic Principles course. They also reported, however, that those students who attended the lectures performed better on essay questions than those who did not. A similar study by Campbell McConnell and C. Lamphear (1969) found no significant

difference in the performance of students with no classroom attendance vis-à-vis those attending class. Finally, Stephen Buckles and M. E. McMahon (1971) found attendance at lectures that simply explained material covered in reading assignments did not enhance students' understanding of economics. In this paper we present new evidence on the effects of class attendance on student performance. Our results pertain to the Principles of Economics course as it is taught in a two-semester sequence at a medium-size, comprehensive state university.

I. The Data

The data for this study were collected by surveying students at the end of the semester in several sections of the Principles of Economics course (both micro and macro). A questionnaire was administered over three semesters, Spring and Fall 1993 and Spring 1994. The data on absences are the estimated number of classes missed as reported by the students themselves.¹ The observations on student grades (on a ten-point scale as collected, or as a percentage of the possible course points for those using a point system) were normalized to a single instructor's grading scale. This was done to minimize any grade effects in the data across instructors. Table 1 provides descriptions of the variables employed in the study, along with their means and standard deviations.

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¹Since some classes were large, roll was not called in all sections. However, one researcher was able to correlate attendance on eight unannounced quizzes with student reported absences. The correlation was 0.79 ($p < 0.01$), even though some students reported more than eight absences.

TABLE 1—DESCRIPTION OF VARIABLES ($n = 346$)

Variable	Description
AVE	Student course average
ABS	Number of absences
ABS1	Dummy: 1 if absences = 1 or 2, 0 otherwise
ABS2	Dummy: 1 if absences = 3 or 4, 0 otherwise
ABS3	Dummy: 1 if absences = 5 or 6, 0 otherwise
ABS4	Dummy: 1 if absences = 7 or 8, 0 otherwise
ABS5	Dummy: 1 if absences > 8, 0 otherwise
MSAT	Math SAT score
VSAT	Verbal SAT score
GPA	Grade-point average ($\times 100$) on a four-point scale
HSCHECON	Dummy: 1 if had high-school economics, 0 otherwise
CALC	Dummy: 1 if taken college calculus, 0 otherwise
RACE	Dummy: 1 if white, 0 otherwise
FRATSOR	Dummy: 1 if sorority or fraternity member, 0 otherwise
ECON	Dummy: 1 if previously had a college economics course, 0 otherwise
STUDEC	Time spent studying economics (hours per week)
MF	Dummy: 1 if male, 0 if female
EDUC	Dummy: 0 if either of the student's parents had a high-school education or less, 1 if either parent had some college, 2 if either parent had a college degree, and 3 if either parent studied at the graduate level
COLPREP	Dummy: 1 if the high school program was college preparatory, 0 otherwise
EXCURR	Dummy: 1 if one or more extracurricular activities, 0 otherwise
HRSCAR	Number of credit hours carried during current semester
HRSWK	Number of hours worked per week in job
STATE	Dummy: 1 if from North Carolina, 0 otherwise

Variable	Mean	SD
AVE	72.234	10.000
ABS	3.512	3.660
ABS1	0.277	0.448
ABS2	0.159	0.366
ABS3	0.162	0.369
ABS4	0.061	0.239
ABS5	0.104	0.306
MSAT	515.647	89.372
VSAT	466.960	76.235
GPA	269.538	56.020
HSCHECON	0.454	0.499
CALC	0.532	0.500
RACE	0.951	0.216
FRATSOR	0.214	0.411
ECON	0.419	0.494
STUDEC	2.400	1.883
MF	0.621	0.486
EDUC	1.621	1.131
COLPREP	0.538	0.499
EXCURR	0.720	0.450
HRSCAR	13.081	5.481
HRSWK	7.818	11.097
STATE	0.899	0.302

II. Empirical Results

Table 2 reports two ordinary least-squares (OLS) regressions with course grade average (AVE) as the measure of student performance and the dependent variable. In regression (1), absences (ABS) enters as a continuous independent variable along with other variables which were included to control for differences in background, ability, and motivation across students. The estimated coefficient on the number of absences per semester (ABS) has the expected sign and is statistically significant at the 1-percent level. Using the mean values for those independent variables that are significant at the 5-percent level, regression (1) implies that an average student who has not missed any classes during the semester obtains a course grade average of 74.8 percent. Alternatively, an average student who has the average number of absences during the semester (3.5) achieves a course grade average of 73.7 percent. It appears that the opportunity cost to the student in terms of grade average of those 3.5 absences is low, but it could result in at least a half-letter-grade reduction for those who are on the numerical margin.

In order to explore further the relationship between absences and academic performance, we included absences as a dichotomous independent variable. As shown in Table 1, ABS1 equals 1 if the number of absences is 1 or 2, and is 0 otherwise; ABS2 is 1 if the number of absences is 3 or 4, 0 otherwise; and so on. The results with absences entered this way are reported in regression (2) in Table 2. Regression (2) indicates that absences do not affect student performance until a typical student has missed five or more classes (i.e., with ABS3). Zero through four absences (i.e., ABS1 and ABS2) have no statistically significant effect on course grade average.

Regression (2) also reveals that as the number of absences increases above the threshold level of 4, the negative impact on grades increases. The coefficient on the binary variable distinguishing more than eight absences exceeds (in terms of absolute value) the coefficient on the variable for

TABLE 2—DETERMINANTS OF STUDENT PERFORMANCE
IN PRINCIPLES OF ECONOMICS
(DEPENDENT VARIABLE: AVE)

Independent variable	(1)		(2)	
	Coefficient	t value	Coefficient	t value
Constant	32.941	3.869**	33.919	3.941**
ABS	-0.328	2.691**		
ABS1			0.465	0.382
ABS2			-1.538	1.105
ABS3			-3.228	2.286*
ABS4			-3.475	1.828†
ABS5			-3.521	2.117*
GPA	0.083	9.796**	0.078	9.125**
CALC	3.304	3.704**	3.352	3.752**
HSCHECON	2.738	3.304**	2.766	3.346**
VSAT	0.014	2.353*	0.014	2.350*
RACE	4.173	2.159*	4.524	2.327*
MSAT	0.011	2.009*	0.011	1.972*
FRATSOR	-1.987	1.903†	-1.886	1.804†
EDUC	0.718	1.899†	0.695	1.829†
ECON	-1.091	1.271	-1.027	1.190
HRSWK	-0.041	1.087	-0.049	1.283
MF	0.663	0.735	0.736	0.797
EXCURR	-0.615	0.627	-0.595	0.604
STATE	-0.699	0.509	-0.737	0.536
STUDEC	0.103	0.457	0.093	0.411
HRSCAR	-0.015	0.193	-0.021	0.266
COLPREP	-0.156	0.178	-0.097	0.110
Adjusted R ² :	30.431		0.435	

†Statistically significant at the 10-percent level.

*Statistically significant at the 5-percent level.

**Statistically significant at the 1-percent level.

seven or eight absences, which in turn is larger than the coefficient on the variable for five or six absences. The data seem to suggest what many professors have thought all along: the typical student is not adversely affected by a few absences, but excessive absenteeism (in this case, five or more misses) is associated strongly with poor academic performance.

The estimates reported in Table 2 also reveal interesting results with respect to other independent variables that were significant at the 10-percent level. Previous studies, including a recent one by Park and Kerr (1990), confirm our findings that GPA and college-entrance-exam scores (i.e., MSAT and VSAT) are among the most important determinants of student performance in college economics courses. In addition, we find that having had a course in calculus has a significant positive effect on student performance. This is consistent with

the results of David Brasfield et al. (1992) who found that students who have had a first course in calculus perform better than students who have not.

At one time, the preponderance of evidence suggested that having taken a course in high-school economics had either no effect or, possibly, a negative effect on student performance in college economics (John Siegfried and Rendigs Fels, 1979). Recent studies, however, have reported a contrary result, that a high-school economics course improves performance at the college level (A. Myatt and C. Waddell, 1990; Brasfield et al., 1993). Our results are consistent with the recent studies and show that having taken a high-school economics course (HSCHECON) contributes positively and significantly to student performance in Principles of Economics. Not surprisingly, we also find that parents' educational attainment is positively associated with students' performance. Minority students (RACE) and students who are members of a fraternity or sorority (FRATSOR) do not perform as well, other things constant.

Finally, we find no gender-related differences in student performance. This is contrary to much of the reported evidence on gender effects in the literature. Many studies have found that males score higher than females on multiple-choice exams in college economics courses (see Siegfried, 1979; Keith Lumsden and Alex Scott, 1987). Our result is consistent, however, with a recent study (Mary Williams et al., 1992) that found no significant difference in the performance of males and females. Their result held across different courses and also for performance measures other than multiple-choice exams.

III. Conclusions

The results of this study indicate that attendance does matter for academic achievement in a Principles of Economics course. The evidence suggests that the effect is nonlinear, becoming important only after a student has missed four classes during the semester. What really seems to matter is excessive absenteeism.

Why absences beyond a certain threshold level affect performance is not clear. Is it because there are only a certain number of lectures that the student can afford to miss before it begins to affect comprehension of the material? Or does this "threshold effect" simply reflect the fact that the better students make good class attendance a habit and typically do not miss more than three or four classes per semester? Further work will be needed to answer these questions definitively.

Finally, our results largely confirm the findings of previous studies with respect to most other factors which have been found to affect student performance in economics. As exceptions, we find no difference between the estimated average scores of females and males and that having had a high-school economics course increases the average student's grade (all *ceteris paribus*, of course). These latter two findings are consistent with the more recent literature, indicating that the high-school economics course may be more effective than in past years,² and that women may be more inclined to take those analytical high-school courses which foster the type of reasoning that enhances performance in college economics classes.

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²This suggests improved teacher training in college and in economics education programs.