

# **Making Economics Engaging**

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## ***ABSTRACT***

*Faculty members at many business schools are working to revise curriculum and update their pedagogy. This paper will review advances that have been made in economics education. It will provide an overview of the movement toward interactive classes and the techniques that may be used in class. In particular, the effectiveness of one-minute papers will be analyzed. A study conducted in Spring 2009 found that the use of one-minute papers in a Principles of Macroeconomics course did have a significant, positive influence on students' final grades. Other significant factors were attendance and prior grades.*

## **INTRODUCTION**

Faculty members at many business schools are working to revise curriculum and update their pedagogy. The energy to do so may come from a directive of the senior administration of the institution, or to please accrediting agencies, or from the faculty member's own sense that students are not learning as much as they "should be." Either way, professors face uncertainty and ask a litany of questions: What am I doing wrong? Why do I have to change? This has worked before, why isn't it working now? Where do I go from here?

This paper will investigate advances that have been made in economics education. Faculty members have been researching student performance, assessment, student engagement, active learning, and many other areas which business faculty members are being encouraged to investigate. This paper will also look at what we in business education can adapt for our own classroom use. It will provide an overview of the movement toward interactive classes and the techniques that may be used in class. In particular, the effectiveness of one-minute papers will be analyzed.

## **LITERATURE REVIEW**

Numerous factors impact student performance in a course. Many of the factors are based on the student himself, perhaps aptitude, time spent studying, absences, choice of major, etc. There are studies that indicate factors controlled by the instructor do indeed impact student performance. For example, Sewell (2004) found that the policy of dropping a lowest test grade during the semester leads to lower performance on comprehensive final exams. As far back as 1974, Anderson noted that the way in which concepts are organized can impact student retention of the material. Miller and Westmoreland (1998) find mixed results as to the effect of selective homework grading on test performance.

There is a sense among some business faculty members that the traditional ‘talk and chalk’ method of delivering material is not as effective as techniques that engage the student. In lecture, the instructor is active and the student passive. Techniques to engage the student, and hopefully improve learning outcomes, shift the focus from the instructor to the learner. The student is given the opportunity to engage the material as it is being presented. Watts and Becker (2008) find that the use of alternative teaching methods has been slowly growing. While lecture is the dominant approach, there is more use of classroom discussions, computer lab assignments, classroom experiments and other methods than in prior years.

## **OVERVIEW OF ACTIVE LEARNING TECHNIQUES**

### **Cooperative Learning**

The cooperation in ‘cooperative’ learning is between the students. Cooperative learning techniques provide a structure through which students interact with one another in pairs or small groups. A key to this interaction is to create a dependency within the group. This can be accomplished in-class in some easy ways. For example, each group is given only one copy of the questions to be answered. People in the group are given roles: timekeeper, writer, facilitator, etc. Out of class assignments such as presentations, case studies and papers can also be structured cooperatively; the professor must ensure some interdependence. One approach is to make each team member an ‘expert’ who receives special instruction from the professor in one area of the topic the group is researching. The special instruction could be on reviewing literature, data collection, data analysis, etc. Sources include

### **In class Experiments**

There have been a variety of experiments published on both economic and finance topics. The goal is to involve students in an actual market. They may take on roles as buyers, sellers, regulators or others depending on the experiment. Experiments may address decision making within monopolies, labor markets, externalities, inflation, or even the Federal Reserve Open Market Committee. Some experiments are designed to be conducted in class; others via computer. While these may seem like games to the students, the activity can help students better understand the interactions between buyers and sellers through experience. Sources include

### **Interpretative Questions and Group Discussion**

Students are assigned an article or case study to read before class. The instructor prepares discussion questions designed to help students work through the theoretical and practical aspects presented in an author’s work. The questions may be used to help students work through difficult articles in academic journals, articles from the business press or a prepared case study. A key is to structure incentives so that students do indeed read the article before class.

### **Writing as Interactive Learning**

Some professors want students to learn to write; others want students to write to learn. In a business curriculum, both are important. Employers expect college graduates to be able to communicate effectively. Faculty may use writing outside of class to help build skills. Writing outside of class need not be a formal research paper, although such papers do have value.

Instructors may use student journals and reflection papers as informal writing assignments [Brewer and Jozefowicz (2006)].

One goal of writing is to reinforce the business concepts from class. Many professors avoid giving writing assignments because of the time required to assess the work. Keeping the question(s) short and succinct lessens the instructor's burden of grading. Minute papers focus on writing to learn, not learning to write. Papers may be given at the beginning or end of class, in which students are asked one or two simple questions. Pre-class papers may ask questions such as "What do you know about . . . ?" to assess prior understanding of the day's concept. Post-class papers could include questions such as "What was most confusing about class today?" Students can also be shown a chart or table with real-world data, then asked to provide a written interpretation. Other prompts could ask students to state the advantages and disadvantages of a theory discussed in class.

Almer, Jones and Moeckel (1998) found that students who wrote one-minute papers scored better on subsequent essay quizzes but not on multiple-choice quizzes, and that students whose one-minute papers were graded did not score better than those non-graded. Grading was done by an outside instructor; questions were not used in the class. Chizmar and Ostrosky (1998) conducted a study in which the instructor began class with review of questions from the prior meeting's one-minute papers. The control groups did not write papers and did not hear a review at beginning of class. Students in class that wrote one-minute papers scored higher on the TUCE (Test of Understanding of College Economics) at the end of the semester.

## **METHODOLOGY**

This study was conducted in Spring 2009. Three sections of Principles of Macroeconomics were taught by same instructor on same days (MWF). Two sections were the control group; students did no writing except on quizzes or exams. One section comprised the experimental group; students took the same type of quizzes and exams plus they wrote a one-minute essay at end of each class. Two questions were asked:

1. What did you learn in class today?
2. What was the most confusing thing in class today?

The research question is whether writing influenced students' final grades. This study differs from other studies in that the minute papers were not graded. Each paper was read by instructor and any student questions were answered in writing and returned to student one to three days later. The study also differs from prior research because of the data on student background. The University's Registrar graciously provided data which prior literature has found to have an impact on student grades: cumulative GPA, cumulative credit hours earned, grade in prior course, SAT math and SAT verbal scores. Other variables include gender, status as a student-athlete, and absences.

**Table 1: Descriptive Statistics**

Variable	Mean	Std Dev	Minimum	Maximum
Final Average	78.1	12.2	33.3	94.5
SAT Verbal	498.8	78.1	360	700
SAT Math	523.7	77.7	370	710
Cumulative credit hours earned	56.2	27.6	13	133
Cumulative GPA	2.9	0.7	1.5	4
GPA for Principles of Microeconomics	2.7	0.9	1	4
Number of absences	4.3	4.8	0	23

## **RESULTS**

The most significant factor in predicting a student's final average in Principles of Macroeconomics was, not surprisingly, the student's grade in Principles of Microeconomics. The correlation was +0.81. Due to concerns about multi-collinearity, a series of stepwise OLS regression was run to determine other variables that may have predictive value.

As Table 2 shows, the number of absences detracted from a student's grade. Females had a higher average than males. The SAT Math score was more significant than Verbal. A key finding is that students in the section that wrote the one-minute papers did score higher than students who did not. In the fourth regression, the 'section' variable was significant at the 11 percent level.

**Table 2: Determinants of Final Average**

Variables	OLS 1	OLS 2	OLS 3	OLS 4
(Constant)	40.556 *** (8.10)	50.275 *** (9.18)	43.731 *** (7.63)	54.726 *** (7.85)
Section of course	4.554 ** (2.13)	5.934 * (1.90)	4.103 * (2.07)	3.711 (2.26)
SAT Verbal	0.008 (0.02)	0.012 (0.02)		
SAT Math	0.023 (0.02)	0.011 (0.02)	0.024 * (0.01)	0.014 (0.02)
Cumulative credit hours earned	0.041 (0.04)	0.037 (0.05)		
Cumulative GPA	7.278 *** (2.01)		7.945 *** (1.96)	
GPA for Principles of Microeconomics		5.934 *** (1.90)		6.52 *** (1.79)
Number of absences	-1.153 *** (0.24)	-1.074 *** (0.28)	-1.098 *** (0.24)	-1.007 *** (0.27)
Gender	3.551 (2.23)	2.712 (2.59)	3.905 * (2.19)	2.535 (2.54)
Adjusted R <sup>2</sup>	0.775	0.751	0.777	0.757
N=54. Standard errors in parenthesis. *** Significant at 1 percent. ** Significant at 5 percent. * Significant at 10 percent.				

The regression helps illuminate a few key independent variables: section, number of absences, gender and prior grade. This raises a question of whether there are confounding effects. For examples, how much of the section effect is due to, say, a concentration of derelicts in one class?

An analysis of covariance is conducted investigate the relationships. The key grouping variable is the section of the course. To further investigate the impact of the writing, students were grouped by gender and section: males in writing section, males in regular section, etc. The data was sorted by absences (low, typical, high) and by grade in a prior economics course (low, average and high). Table 3 shows that, adjusting for absences and prior grade, the section did have a significant effect on a student's final average. Females in the writing class earned the highest average, followed by females in the regular class, then males in the writing group, with males in the regular class scoring the lowest final average.

**Table 3: Analysis of Covariance**

SOURCE	F	SIG.	PARTIAL ETA SQUARED
Corrected Model	23.141	.000	.729
Intercept	300.083	.000	.875
Econ GPA	18.988	.000	.306
Absences	24.135	.000	.360
Section effect by gender	2.997	.041	.173

## CONCLUSIONS

Active learning exercises may make the courses more interesting for students. One minute writing is a type of active learning that can increase students' learning with a relatively low cost to the instructor. Female students may benefit more than males, adjusting for other factors. Further work could be done with a larger group of students and with variations on the extent to which the papers are graded.

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