The Finance Professor Teaching an Early Morning Class

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A broad literature affirms the compromised performance of many people in early-morning settings. How does this affirmation manifest itself in the academic environment in general and the finance classroom in particular? We extend the work of disciplines outside the business school and find a need for the finance instructor to anticipate special needs for the early morning class; students in 8:00 classes, relative to 9:30 classes, underperform, and this underperformance is more pronounced for those with jobs. We provide clear evidence of the better performance of the student in the later class that has no outside employment, and extend these findings to a new set of guidelines for use in early morning classes.

INTRODUCTION

A great many researchers suggest that a number of exogenous factors impact the performance of students across varied disciplines. Common explanatory variables include the students' sex, age and major; among business disciplines, the students' quantitative backgrounds and the *instructor's* gender have been highlighted as predictors of grades in selected classes. Class attendance has also been held out as a predictor of final course grades. Varied authors, though, find conflicting results in their searches for common themes among the successful college or business student. The increasing prevalence of non-traditional class times has also attracted the attention of selected investigators.

In this paper, we consider the direct impact of the often least-desired class time -- 8:00AM -- on student performance, especially among students who, more and more frequently, have jobs outside of school. While varied authors allude to the potential for the broad underperformance of people in many late night or early morning activities, none considers the separable impact of early morning class times and employment upon the business student in general or the introductory finance student in particular.

The 8:00 class is usually the last time slot to "fill up" in a typical registration period. While popular with some students for getting the day started or perhaps for just "getting it over with," the early morning slot is often left with empty seats and groggy students; performance in those classes is certainly compromised, but direct measures of under-performance, and appropriate remedies for those suboptimal outcomes, are not immediately clear. We extend the research in this paper with an examination of the early morning class and the explanatory power that the class time and outside work have in explaining grading outcomes.

We find that introductory finance student performance is compromised in 8:00 time slots. These findings may be unsurprising, but the result bears careful consideration. While students must be warned of the need to maintain particular vigilance in 8:00 classes, faculty members must also seek to keep early morning students engaged. As such, this paper concludes by giving suggestions for improving student focus in early morning classes.

BACKGROUND

Researchers have been pondering the factors that influence student performance for several decades. Among the earliest, Clauretie and Johnson (1975) find that the student closer to graduation, with a higher GPA, who is male and an economics major, performs better than his peers in an introductory economics class; their findings would likely be echoed in an intro finance class. Anderson, Benjamin and Fuss (1994) extend Clauretie and Johnson and underscore the importance of a student's quantitative background in framing success in an introductory econ class. Ballard and Johnson (2004) accept the earlier Anderson, et al findings holding that a "basic understating of algebra" is needed to master initial studies of economics. Schuhmann, McGoldrick and Burrus (2005) note the limited quantitative skills of a great many students, and the need for "quantitative literacy" to frame "economic literacy."

Of special significance for the 8:00 class, Newman-Ford (2008) finds a statistically significant correlation "between … attendance and academic attainment." Newman-Ford's and Ballard and Johnson's (2004) studies are preceded by Durden and Ellis (1995); Durden and Ellis affirm that attendance and the prior study of calculus are positively correlated with better grades in economics. Chan, Shum and Wright (1997) find that attendance is important, but that the relationship with grades is not such that professors should "mandate that students regularly attend" class.

Examining finance student performance alone, Filbeck and Smith (1996) extend Holley and Jenkins (1993) and find that student performance on corporate finance exams is significantly correlated with the four descriptive factors in the Myers- Briggs personality profile. Henebry (1997) and Wilson (2002) underscore the still-evolving nature of research into the factors influencing introductory finance student performance, the former finding improved student performance in shorter, thrice-weekly classes, the latter finding the better performance in less frequent and nighttime classes.

No circulating study we found considered both the impact of the early morning schedule and a student's work responsibilities outside school in describing class outcomes (grades). Many argue that eight o'clock classes help prepare students for the discipline of having a regular job, but do they sacrifice a higher grade as a result? In this paper, we first describe grades as a function of class time and other explanatory variables and then we provide potential remedies for the adverse impact of early morning classes.

DATA

The data used in our study is a unique data set using student academic records, student self reported data, and instructor reported data. The data includes students enrolled in introductory finance under one professor over five semesters

ending in the fall of 2008. All the students were enrolled in morning sections, but some took the 8:00 class and some took the 9:30 section. Because of the brevity of the survey, almost all students enrolled in the classes participated in the survey and fewer than 10% of the surveys were discarded due to inconsistencies or unanswered questions. In all, there were 384 observations in the final data set. Variables collected include:

Academic records:

- GPA (student grade point average at the time of taking the finance course; if necessary, transfer student grade point average are proxied by their graduation grade point average)
- FINANCE (1 if student pursues a finance concentration, 0 otherwise)
- TOTAL (total hours taken at university prior to enrollment in the finance course),
- SEN (1 if the student is a senior, 0 otherwise),
- DOUBLE (1 if the student has two majors, 0 other wise),

Student reported:

- HOURSW (hours worked per week)

Instructor reported:

- CLASS8 (1 if student is enrolled in 8:00 section, 0 otherwise)
- SEM_j (a set of dummy variables indicating the semester that the finance course was taken)
- FINGRADE (average grade points earned in the finance course)

A brief statistical description of the variables utilized is provided in Table 1.

Over sixty-one percent of the students comprising the sample were from 8:00 classes (as there are more 8:00 sections included in the data set). Average hours worked per week was almost 18 hours, with a surprising maximum for one enterprising student of 55 hours. The average GPA was a 3.25, twenty-nine percent of the students were finance majors, and close to half were seniors. Few (less than 10%) were double majors, and almost all majored in business, indicating they had previously been accepted to the business school.

THE HYPOTHESES AND THE MODEL

Using our data set, we test the following hypothesis about early morning classes.

Hypothesis: Students in 8:00 classes (i.e. early morning classes) underperform students in later morning classes.

To test this hypothesis, we use OLS to estimate the following model:

$$FINGRADE_i = \beta_0 + \beta_1(CLASS8_i) + \beta_2(GPA_i) + \beta_3(HOURSW_i) + \beta_4(FINANCE_i) + \beta_5(TOTAL_i) + \beta_6(SEN_i) + \beta_7(DOUBLE_i) + \beta_j(SEM_{ji})$$

Table 1. Descriptive Data.

Descriptive information is given below for the factors employed in the models within this paper. The data were gathered by surveying introductory finance classes at 8:00AM and 9:30AM, over successive semesters between the fall of 2006 and the fall of 2008.

Variable	N	Mean/Fraction of the Sample*	Std. Dev.	Min	Max
CLASS8	236	0.615	NA	0	1
GPA	384	3.259	2.168	1.53	4
HOURSW	384	17.788	13.3	0	55
FINANCE	111	0.289	NA	0	1
TOTAL	384	84.286	17.675	7	161
SEN	178	0.464	NA	0	1
DOUBLE	34	0.089	NA	0	1
FALL06	48	0.125	NA	0	1
SPR07	53	0.138	NA	0	1
FALL07	103	0.268	NA	0	1
SPR08	93	0.242	NA	0	1
FALL08	87	0.227	NA	0	1

*Means are provided for the hours worked per week (HOURSW), the GPA and the total academic hours completed (TOTAL). Fractions or percentages of the total sample of 384 are given for the other factors.

NA = Not Applicable, as with the standard deviation of a dummy variable.

where the variables are defined as before and SEM is a set of semester dummies from Fall 2006 to Fall 2008 with the omitted semester being Spring 2008.

Based on the results of prior research and conjecture, we anticipate positive and significant signs for the coefficient estimates for GPA, FIN, TOTAL, SEN, and DOUBLE; finance students care more about finance courses, and experience at the university should help students to anticipate the needed study time for a good grade. We have no priors concerning hours worked or students with double majors; on the one hand these students may be able to balance their time due to their increased responsibilities, but on the other, they may be stretched too thin to pursue finance studies with excellence.

Since the classes selected were taught by the same instructor, in successive semesters, we do not have to control for instructor. As well, there are no controls for math background since calculus is a prerequisite for gaining admission into the business school. A multitude of other factors (math SAT scores, foreign language proficiency, age, sex, and marital status come to mind) might contribute marginally to this description, but we wished to keep the models as simple as possible, and directed our attention to the working student in the early morning class.

Model results are portrayed in Table 2. Our results, with reference to our hypotheses, are consistent and in line with our expectations. GPA and finance concentrations are positively and significantly related to student grades in introductory finance; each of these last two factors is robust and significant at the 1% level. In addition, hours worked is associated with negative and significant impact upon student grades across the

Table 2. Regression Results[1] .

OLS results with class grade as the dependent variable. Traditional tests for the normality of the residuals (White's test), multicollinearity (VIF) and serial correlation (Durbin-Watson) were conducted with no disconcerting results. Test specification findings are available on request. T-statistics for the significance of the variables are given in brackets along with the Adjusted R^2 and F-test results. Significance at the 10%, 5%, and 1% levels is shown by *, **, and *** respectively.

Variable	1		2		3		4	
CLASS8	-0.1292		-0.12113		-0.1316		-0.12451	
	[-1.66]	*	[-1.54]		[-1.68]	*	[-1.58]	
GPA	0.04266		0.0427		0.04258		0.04265	
	[2.77]	***	[2.77]	***	[2.76]	***	[2.77]	***
HOURSW	-0.01145		-0.01167		-0.01134		-0.0114	
	[-4.52]	***	[-4.56]	***	[-4.44]	***	[-4.51]	***
FINANCE	0.27587		0.28992		0.27154		0.27928	
	[3.73}	***	[3.76]	***	[3.61]	***	[3.74]	***
TOTAL			0.00132					
			[0.65]					
SEN					-0.0229			
					[-0.33]			
DOUBLE							0.04747	
							[0.40]	
FALL06	0.05951		0.06675		0.0577		0.06059	
	[0.48]		[0.54]		[0.47]		[0.49]	
FALL07	-0.20402		-0.20201		-0.20439		-0.20365	
	[-2.18]	**	[-2.15]	**	[-2.18]	**	[-2.17]	**
SPR07	0.1709		0.1671		0.1729		0.172	
	[1.43]		[1.40}		[1.44]	**	[1.44]	
FALL08	-0.14644		-0.14271]		-0.14707		-0.14323	
	[-1.50]		-1.46		[-1.50]		[-1.46]	
Intercept	3.07631		2.95764		3.08816		3.06702	
	[28.81]	***	[13.99]	***	[27.42]	***	[28.03]	***
F-Value	6.84	***	6.12	***	6.08	***	6.09	***

1. "Spr08" was held out to allow the matrices of the other dummy variables to invert, and provide valid coefficient estimates. Results are similar independent of the "hold out" semester chosen.

models. For every hour worked, a student, on average, can expect a 0.012 point reduction in their grade (on a 4-point scale.) For example, a student that works 20 hours would realize an average grade reduction of approximately 0.23 points. For the typical student, this means that working a part-time job entails a modest likelihood that if four courses are being taken, three will exhibit declinations in grades from, for example, a B to a B minus, or an A minus to a B plus; similarly, three B's and one A would likely be changed to four B's (from a semester GPA of 3.25 to around 3.00). Controlling for other factors, and as shown in Table 2, the reader might notice the significant underperformance of the students in the fall of 2007, that semester populated by a distressingly unmotivated coterie.

Concerning our stated hypothesis, the adverse impact of having an 8:00AM class was significant (at the 10% level) in two out of the four regressions with the other two very nearly significant. Thus, there is evidence that taking earlier classes negatively impacts a student's grades. We postulate that the underperformance is attributed to students being tired, experiencing stress from high volumes of traffic and worrying about getting to class on time, and perhaps the impacts of a night on the town. Applying this finding, we now provide some best practices for those instructors teaching 8:00 sections.

SUGGESTED INSTRUCTIONAL RESPONSE: ACTIVE LEARNING (AND OTHER) TECHNIQUES

Managing a classroom is difficult work; this is especially true for the early morning class. Seasoned professors gradually become adept at identifying the psychology at work in these groups, but each class provides its own challenges. There is a general understanding that young people need more sleep to sustain themselves, and many of them remain awake until well after midnight. Thus, when a class meets at 8:00AM, it is reasonable to expect that many of the students are sleep-deprived and many students literally have not yet awakened, having arisen only moments previously.

Having affirmed and measured the underperformance of the working student in the early morning class, what options might be available to the student and the professor in tempering the lower grades and expected "underperformance?"

Finance education has traditionally relied on lectures, supplemented by technical handouts, as the main instructional delivery method. This tradition has motivated students to become *passive* recipients of information given in the traditional lecture format in which the students' only responsibility is to recall what was covered in the lectures and textbook and reveal a familiarity with that information during exams. Pair this information delivery and testing-system is particularly dubious in an early morning setting.

In an attempt to counter the impact of "the straight lecture", Light (1990) shows that students tend to better comprehend and retain complex concepts when they become actively involved in their learning process. In recent years, business schools, and in particular accounting and finance departments, have put in place curriculum changes and employed techniques aimed at increasing student involvement in the learning process. Experiences that involve students and require them to interact as part of their own learning are more likely to maintain student interest and are easily inserted into lectures. Additionally, active learners seem to be more likely to attend class, to become "engaged." When students are asked to participate instead of passively receiving information, they stay focused, audit their own understanding, and are cued to content that has been selected for emphasis. These efforts are vitally important to ameliorate the negative impact of early morning classes.

Active learning also has potential spillover effects in the business world; business executives have voiced concerns that students need to be better-prepared to handle new, unstructured situations, and to search for information from multiple sources. Rather than require more knowledge of certain domain-specific areas (for example, corporate finance and investments in the field of finance), prospective employers have asked that graduates have learned how to learn. The professor might be able to address these perceived shortcomings of the classroom, *and* diminish the underperformance of the early morning and/or working student with the same pedagogical approaches.

We now supply a list of practical active learning (and other) methods for teaching the 8:00 class. In these bits of advice, we assume that the student is the problem and not the professor. (If you suspect that you are the problem, we suggest Starbucks.)

1. BEGIN THE CLASS WITH A BANG. Since students are asleep when they hit their seats, immediately engage them. Tell a story, discuss a current event, use a video clip, and don't immediately move into "chalk and talk."

2. KEEP THE CLASS LIVELY WITH IN-CLASS DISCUSSION AND 'THINK, PAIR, SHARE'. Engage the 8:00 learners with continued in-class exercises where they are forced to speak. Theis (2007) says it best: "If you would like to increase attendance at early morning classes, I recommend incorporating in-class discussion exercises…I typically have students work through a single exercise in small groups … halfway through the class. I let them work for 5 minutes, then we review it as a class. The students get to grapple with a key concept, get moving and talking during an 8:00AM course, and receive a few points for their effort each day…This approach is currently working in a class of 180 as it has previously in classes of approximately 40 students." Johnson and Cooper (1997) report that six professors at Oregon State University, dissatisfied with the lecture method, developed a "feedback lecture." This procedure involved having two, twenty-minute lectures per class meeting, with a professor-posed discussion question after each twenty-minute lecture. Students responded very positively to this approach.

3. KEEP THE STUDENTS GUESSING. Effective instruction mixes things up: boardwork, multimedia, storytelling, discussion, activities, individual assignments, and group work. The more variety built in, the more effective the class is likely to be. Start the class this way, and continue during the class session. If suggestions (1) and (2) are employed, a class session could be easily divided up into 2 mini-lectures beginning with a bang and ending with a discussion.

4. PROVIDE MOTIVATION. Students need to know why a topic is important. To provide better motivation to the 8:00AM finance class, begin the lecture by describing how the contents relate to important business and social problems; tie the class in with the students' experience, interests, and career goals, and do the same thing with each new topic. If all else fails, remind them that they need good grades to get a job (especially in a recession).

5. PROVIDE A CHALLENGE. Will a student be particularly engaged in a class that won't provide a decent challenge?

6. FEED THEM EVERY ONCE IN A WHILE. To get students to attend important club meetings, pizza is provided. These are the same students that attend the 8:00 sections. Once in a while, a box of donut holes can work miracles. Remember that many 8:00 students don't eat breakfast.

7. ADJUST THE CLIMATE. While we realize that this isn't active learning, choose classrooms that are on the east side of your building. If they aren't, make sure the artificial lights are good. If that doesn't work, turn the thermostat down.

8. DON'T LET STUDENTS HIDE. Ask students to sit as close to the front of the class as possible. They'll respond favorably to telling them that the last three rows are off-limits.

SUMMARY, ENCOURAGEMENTS, AND IDEAS FOR LATER RESEARCH

The remarks above affirm several matters with which almost any college professor is familiar. Students have varying degrees of dedication to their studies, are torn between sundry academic and non-academic commitments, and often have full or part time employment that "competes" with their school work. Many are loathe to take an early morning class, either because of their "night-owl" schedules or simply an embedded aversion to early morning duties. It is in this context that most universities, and many professors, confront the early morning student with late-night or daily work schedules. Our findings confirm that these students, on average, can be expected to underperform. The better student, with the higher GPA, who majors in finance and is unemployed or works the lowest possible number of hours, will outperform her contemporary. The working student "forced" into an 8:00AM class is at risk not only of getting a worse grade, but of not meeting the standards of the professional communities in which the student will likely be working after graduation.

How can the business school, the professor and the university respond to this awkward learning environment? The elimination of 8:00AM classes is not practical, nor is a university policy prohibiting students from off-campus employment. Some universities have toyed with reducing or eliminating *some* early morning classes, and selected colleges once prohibited their students from working off campus without university permission. But, the early class and the attraction of many students to off-campus employment (either by necessity or to fund a special trip or a newer car) are here to stay, and the professor is duty-bound to at least try to lessen the impact of these factors.

We suggest, in very general terms, the use of active learning as a counter to traditional pedagogy. Individual faculty in unique settings are of course allowed, and encouraged, to consider and "beta-test" other protocols to better engage the student, increase attendance, and improve finance (and general college) classroom outcomes. In later work, the powers of other factors -- such as sleep habits, selected demographic variables, geography, season and other personal variables (coffee consumption?) -- to explain, or temper, our observations will be examined. It is in that sort of continually re-examined setting that the finance class, or any class, can be improved, and the experiences of the students enhanced.

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Teaching Auction Theory to Finance Students

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Auctions are generally taught in economics courses in a discussion of game theory or mechanism design. While the topic is important from a theoretical perspective, it is also crucial to students' understanding of how capital markets work, yet few instructional techniques exist for incorporating auctions into classroom discussions in finance courses. This article summarizes a great exercise/game that allows students to learn about auctions through participation in a series of actual auctions. The exercise is designed for a single class period of eighty to ninety minutes. We have used the game as an introduction to courses in both corporate finance and financial markets and institutions both at the undergraduate and graduate levels. It has been well received by students at numerous universities.

INTRODUCTION TO THE EXERCISE

Prior to the start of class, students are given a handout to assist them in taking notes on the game. This handout can be located at www.jfcr.org/jitfvols.html. This document leads them through the exercise and allows them to focus on participating in the exercise rather than furiously scribbling. The handout identifies the main points of the discussion that follows, and it provides them with the rules of the game and space to answer several key questions of importance under each auction mechanism used.

To introduce and motivate the exercise we emphasize types of financial securities and transactions that are typically sold via auction (or auction-like) mechanisms, offering a very brief introduction into several areas that will receive greater attention later in the course: US government bond issues, share repurchases, (contested) corporate acquisitions, initial public offerings, and most importantly, stock, bond, currency and derivative markets. (Additional examples from economics can be mentioned, such as government contracts, mineral rights, fine art, and eBay.) So many finance examples may seem a little overwhelming for undergraduate students in their first finance class, but it gives them a quick exposure to financial terminology without requiring much detail.

After the importance and relevance of auctions has been established, it is much easier to deliver a quick introduction to auctions and the game itself. In addition to the definitions of *Bid Price* (the price a buyer is willing to pay) and *Ask Price* (the price a seller is willing to accept), it is important for the students to understand that a *Reservation Value* is the maximum value that one ascribes to an asset. The concept of reservation value is very important for the duration of the lesson.

Another (typically) new concept for both undergraduates and graduate students is the variety of auction mechanisms available to sellers when they offer their items for sale. The following list of mechanisms is discussed briefly: (1) Open outcry (oral) vs. Sealed bid (confidential), (2) First-price (the highest bidder pays the highest price bid) vs. Second-price