

September 2006

## Should I Skip Class?

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### Abstract

Professors routinely struggle with student attendance in the classroom. Often students that struggle with the lecture material have the poorest attendance and those who excel generally have excellent attendance. Some professors address this dichotomy by using announced or unannounced daily quizzes taken solo or in pairs (dyad) as a means to improve student attendance. In this study we evaluated the effect of unannounced quizzes on student grades in an Introductory Soil Science class over two consecutive semesters (136 students total) at the University of Tennessee (UT) and compared it with results from six semesters (425 students total) in a similar Introductory Soil Science class at the University of Minnesota (UM) where attendance points are structured into the syllabus with daily lecture quiz dyads. Results clearly show that all UT students that earned A's missed no more than three lectures and that students that missed no lectures earned at least a B. Similarly, UM students that earned A's attended at least 80% of all lectures. Therefore, we conclude that giving announced or unannounced quizzes is beneficial to students with both excellent and poor attendance habits. Quizzes and exams positively affect student learning thereby suggesting that class time used for taking and reviewing quizzes and exams is fundamental to student learning and mastery of the subject matter.

### Introduction

Most instructors understand that student success in large lecture sections is highly correlated with student attendance, yet student attendance in large lecture sections often dwindles as the semester progresses. Highly motivated students have increased academic success (DeRoma et al., 2004) with excellent classroom attendance. Students give multiple explanations/excuses why class attendance drops such as early morning class times, conflicts with work, other exams or projects that seem to be more important than missing an occasional class. Many students eventually realize the importance of classroom attendance and participation but it is often too late to earn the grade that reflects their aptitude and abilities.

Allowing students to earn points through lecture quizzes can seem somewhat paradoxical. For example, students who are excelling in the class usually have better attendance suggesting that points associated with attendance will only assist students who are already attending and negatively impact those who are not. Some instructors include participation points in lecture syllabi in an attempt to overtly entice students to improve their attendance and, supposedly, their likelihood of earning a better grade. Lecture participation points may take the form of announced or unannounced quizzes, classroom attendance checks through assigned seats or roll call, or using in-class discussions to break up the rhythm.

One concern with using participation points in determining final course grade is that these points may only benefit students already successfully passing the course instead of assisting the struggling absentee student. All points that students can earn in a course should be equally available to all students. If students can pass a class without attending it, it seems unfair to essentially lower their grade due to lecture nonattendance. Some instructors address this issue by predicating a passing grade upon class participation/attendance even if passing grades were earned on all examinations (Druger, 2004).

Few research studies address classroom attendance at the university level; no studies indicated that lecture attendance was directly linked with the final grade earned for a course. In this study we evaluated classroom attendance for an introductory soil science course at the UT and the UM and its impact on final grades.

### Materials and Methods

#### University of Tennessee

At UT the Introductory Soil Science course meets for three 50-min lectures and one three-hour laboratory per week. This intensive course covers 20 textbook chapters and 11 hands-on laboratories in a 16-week semester. We evaluated lecture attendance in two consecutive semesters in a class with 58 students and another class with 78 students.

The syllabus for this course included sixteen unannounced five-point quizzes. The instructor used

the following criteria to determine when quizzes were given. If—

1. Attendance in the classroom between two-minutes prior to class time and class time was less than two thirds of enrolled students, a quiz would be given during lecture unless:
2. A quiz had already been given that week; or,
3. It was the last lecture for the week and attendance was above two thirds of enrolled students for the previous two lectures, a quiz would be given regardless of attendance.

The quizzes consisted of questions that pertained to the day's lecture that could easily be answered correctly if the student was conscious throughout the lecture. All questions were based upon scientific principles and had to be answered with either graphs or short essay answers.

Student grades and absences were evaluated with SAS (version 8.2) using PROC REG. After regressional evaluation where attendance quiz points were included, attendance quiz points were deleted and grades assigned based upon points earned solely through lecture exams and laboratory worksheets using the same percentage values to determine the breaks between grades.

**University of Minnesota**

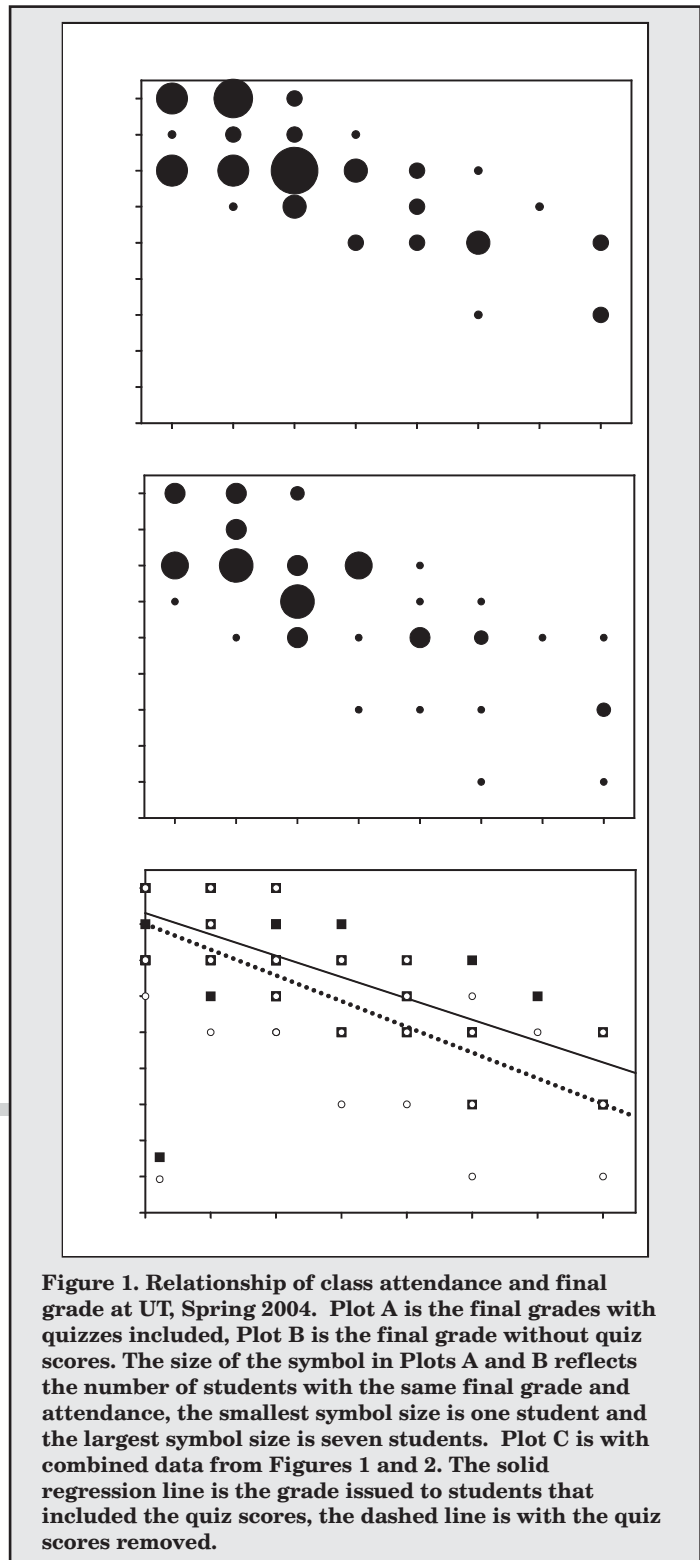
Results from six semesters from Spring 2000 through Spring 2004 were evaluated to determine the effect of attendance on student performance in Basic Soil Science. Similar to UT, lecture quizzes or dyads count for approximately 10% of the final grade. Dyads are given each class period and consist of two students working together to answer one question that pertained to the day's lecture. The student pair hands in one sheet of paper with both names written on it and these are graded by the instructor as well as evaluated for misunderstandings of the lecture principles.

The data were analyzed using PROC CORR and PROC GLM using SAS. The means, pearson correlations, and regression were performed on individual terms and the overall data.

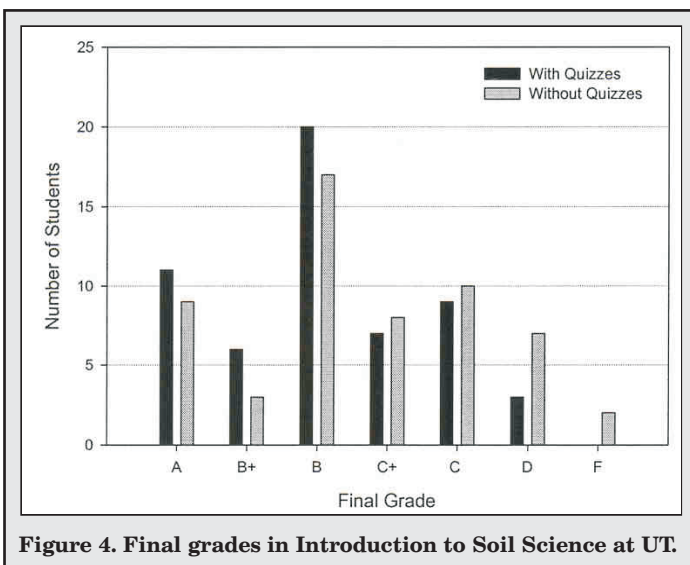
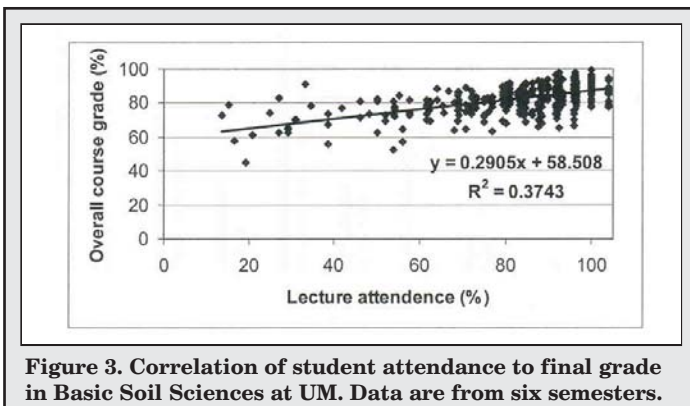
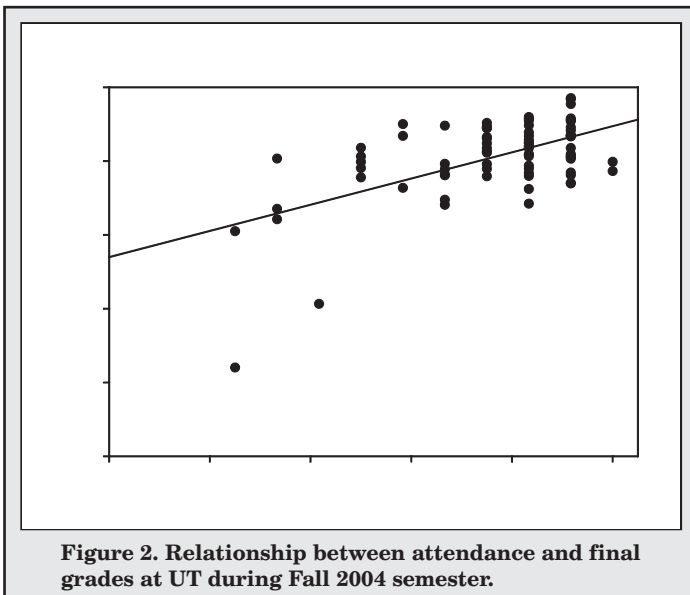
**Results**

Students that attended classes regularly did quite well in the introductory soil science courses at both institutions. However, at UT those who missed no classes earned at least a B in the course and students that earned A's in the class missed no more than three lectures during the Spring semester of 2004 (Figure 1). Similarly, any student earning a B+ missed three or fewer classes; those earning a B missed five or fewer classes. The results were similar for students enrolled during Fall 2004; those that attended at least 80% of the lectures earned an A or a B whereas students with more sporadic attendance had lower grades (Figure 2). These results suggest that student attendance is important to student success in university lecture-based courses.

At the other end of the final grade continuum, students who earned a D missed at least three lectures (Figure 1); five missed lectures was the maximum any student missed and still earned a B. Students earning C's had between one and seven absences. It is clear from this study that attendance is very important in determining the level of student success in this course. The regression analysis



**Figure 1. Relationship of class attendance and final grade at UT, Spring 2004. Plot A is the final grades with quizzes included, Plot B is the final grade without quiz scores. The size of the symbol in Plots A and B reflects the number of students with the same final grade and attendance, the smallest symbol size is one student and the largest symbol size is seven students. Plot C is with combined data from Figures 1 and 2. The solid regression line is the grade issued to students that included the quiz scores, the dashed line is with the quiz scores removed.**



(Figures 1 and 2) indicates that attendance describes over 50% and 34% of the variation associated with attendance and grades for this course in Spring 2004 and Fall 2004, respectively.

At UM attendance also impacted student success. Students needed to attend at least 80% of the lectures to ensure success in the course; many students that

attended less than 60% of the lectures did not, in general, fare well in the course (Figure 3).

However, it is not clear from this study what impact the quiz or dyad has upon final grade. It is possible that lecture attendance is not the most important factor; instead, the additional quizzes may assist the students in better understanding the principles that results in higher exam scores, similar to the results found by DeRoma et al. (2004). In many disciplines the effect of quizzes has been quite extraordinary. Gaynor and Millham (1976) found that psychology students who had weekly quizzes outperformed their counterparts that had only mid-terms and finals essentially what non-attendees had in the course in this study. Duty (1982) reported similar results with chemistry students; Martin and Srikameswaran (1974) reported similar results in their studies with first-year chemistry students as well.

Class attendance is important; however, it could be possible that this class of students is dichotomously split between those students seeking to be successful in Intro Soils and those wishing to not fail Intro Soils. Young et al. (2000) report that students study for exams to either achieve success or to avoid failure. These two approaches to success may explain attendance strategies in this class. Silvestri (2003) found in her research with an education class of 277 students that attendance did not really matter until students missed four or more classes. Students who missed four or more classes were in jeopardy of failing the course, results that are similar to this study.

In-class quizzes improve student grades even if students have imperfect attendance. Figure 4 illustrates the impact of the quizzes on final grade at UT. Using the same macro in the Excel gradesheet, quiz grades were omitted from the spreadsheet and grades were recalculated. By including quiz grades in the final grade more grades of A, B+, and B were assigned (at UT we do not give “minus” grades and only “plus” grades to B and C) and fewer C+, D, and F were assigned. It is important to note that no grades of F were assigned when quiz points were included in the class total. Adding the quiz scores shifted the grades upward, even for students struggling to pass the course. The Y intercept (Figure 1) increases 0.15 grade points and the spread between the regression lines increases as final grade decreases. Therefore, even students with poor attendance habits gained enough quiz pointson the days that they attendedto at least earn a passing grade.

We as teachers may underestimate the impact of our quizzes on the final course outcome, the grade earned by each student. The results of this study suggest that instructors concerned about student progression in college science courses consider quizzes and exams as very important learning tools and not just as evaluation tools. If quizzes are

important learning tools, as the data in this paper suggests, frequent testing is needed if instructors wish to maximize student learning potential. Instructors interested in improving student performance may need to learn how to write better quizzes and exams, metrics that encourage students to think during the evaluation process. Finally, from a pedagogical perspective, it is imperative that each quiz and exam is utilized as an instructional aid; e.g., spending time in class explaining correct answers to quizzes and exams appears to be time well spent.

### **Literature Cited**

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