

Skills versus Concepts: Attendance and Grades in Information Technology Courses

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Abstract

This paper adds to the literature regarding the effect of attendance on student grades by including a focus on non-lecture-based classes. Student attendance and grade records were compared in two types of information technology courses: (1) concepts classes using a lecture format predominantly, and (2) skills classes using a lab environment with mostly individual instruction. Comparisons of attendance versus grade were made between the two types of courses as well as individually for each type of course. Results indicated a significant difference in most comparisons of level of attendance versus grade.

Keywords: Information technology skills, Information technology concepts, Absenteeism

1. Introduction

Many studies have concluded that absenteeism is negatively associated with a student's final course grade. While these studies present conclusions drawn from courses typically taught in a lecture format, there is little research on attendance and performance in a skills class, i.e., a course where students are in a computer lab environment, where much of the instruction focuses on assisting students with computer activities rather than explaining concepts. The study described here was motivated by a need to determine whether previous findings regarding the effect of attendance were also true for students taking "hands-on" information technology skills courses.

2. Background

Previous research in psychology courses (Jones, 1984; Shimoff & Catania, 2001) found a negative relationship between absenteeism and academic performance occurs regardless of gender, race, or instructor. In studies on the effect of attendance in economics courses, Romer (1993) studied attendance in courses at three schools (small, medium, large) and found a statistically significant, large relation between attendance and performance, concluding that attendance alone accounts for 31 percent of variance of the final grade in the course. Additional research on attendance in economics courses (Durden & Ellis, 1995) reports a non-linear relationship between absenteeism and performance such that excessive absenteeism (five or more classes missed) is associated with a lower course grade average. Consistent with Jones (1984), Durden and Ellis (1995) found no significant differences in the performance of males and females. More evidence of the significant relationship between attendance and academic performance is offered by Yakovlev and Kinney (2008), who report on students in an introductory economics course required for all students and claim results from a more diverse population that previous research conducted by Durden and Ellis (1995) in a principles of economics course.

Romer (1993) and Durden and Ellis (1995) studies both cite the issue of multiple motivational factors associated with high absenteeism and the problem of determining whether absenteeism causes poor performance or whether absenteeism indicates lack of student commitment. To overcome this issue, Marburger (2001) used a direct measure of class absence on exam performance by mapping test questions to a given class period. In this way, exam scores were linked directly to student absence in a principles of microeconomics class. Results indicated that absenteeism increased the probability that an average student would respond incorrectly to the average exam question.

Similar studies have been conducted in a public finance course (Chen & Lin, 2008) and an introduction to Japanese course (Gump, 2005) with similar findings: class attendance has a positive, significant impact on student performance as measured by exam grades or course grades. In a study by Barrington and Johnson (2006) that tested the relationship between attendance and performance in a programming course that included both lecture and lab sessions, higher levels of lab attendance were found to be correlated with both higher lab averages and higher course averages.

3. Research

3.1 Research Participants

This study involved a review of attendance records of students in a Management Information Systems (MIS) undergraduate concepts (lecture-type) course as well as students in an MIS undergraduate information technology (IT) skills course taught in a computer lab. Because the students taking the IT skills course being used for this project can take the MIS concepts course during the same semester, the researchers avoided the problem of duplicate students by using students at a different school for the concepts course. The two universities involved in this study are public institutions in the same geographic region of the United States, and both are AACSB-accredited.

The IT skills course provides students with in-depth activities leading to proficiency in business computer skills, focusing primarily on Microsoft Excel and Access. Student text materials are tutorial in nature, and instructors provide brief explanations and demonstrations but focus a majority of their time working with students on an individual basis. Students take Microsoft certification examinations as part of the course, and that performance is included as part of the final grade. The software and assignments are available for students to use outside of class if they prefer to work on their own.

The IT concepts course provides an understanding of the information needs of management, the information technology used by various business subsystems, and how technology can be utilized for competitive advantage. In-class activities include lectures, class discussion, and other class activities to help with comprehension. Course grades are based on quizzes, short writing assignments, chapter exams, and a comprehensive final exam.

The participants for this study were limited to students who completed the course. Those who stopped attending before the final exam were not included in this data. The total usable results involved 164 business students, with 42 students who completed the IT skills courses and 122 students who completed the IT concepts course.

3.2 Research Hypotheses

The following hypotheses were formulated for this study:

- H1: Attendance for students in the IT skills course is not significantly different from attendance for students in the IT concepts course.
- H2: Grade performance for students in the IT skills course is not significantly different from grade performance for students in the IT concepts course.
- H3: Grade performance for students who attend class regularly is not significantly different from grade performance for students who do not attend regularly.

4. Results

Data regarding attendance and course grades were analyzed for each course and for both courses. Means and standard deviations are shown in Table 1, followed by discussion of these

results.

Table 1. Means and standard deviations of course attendance and final grade

Variables	Skills Course N=42	Concepts Course N=122	Both Courses N=164
Attendance	83.96 (9.9)	87.35 (11.6)	86.0 (11.1)
Final Grade	79.10 (11.2)	82.73 (9.9)	81.4 (10.6)

Unpaired (two-sample) t-tests were used to compare differences in attendance and differences in grade performance across courses. Hypothesis 1 predicted that attendance in the IT skills course is not significantly different from attendance in the IT concepts course. As shown in Table 1, means analysis indicated a higher level of attendance for students in the IT concepts course. T-test results show students in the IT concepts course averaged 3.44 percent higher attendance than students in the IT skills course ($t = 1.97$, 194 df, $p = 0.036$). The difference in attendance between the IT skills course and the IT concepts course is statistically significant; therefore, hypothesis 1 is not supported.

Hypothesis 2 predicted that grade performance for students in the IT skills course is not significantly different from grade performance for students in the IT concepts course. As shown in Table 1, means analysis indicates a higher mean final grade for students in the IT concepts course. T-test results show students in the IT concepts course averaged 3.63 percent higher grade performance than students in the IT skills course ($t = 1.97$, 142 df, $p = 0.024$). The difference in final grade between the IT skills course and the IT concepts course is statistically significant; therefore, hypothesis 2 is not supported.

Table 2. Course attendance versus grade

	Attendance	N	Percent	Final Grade
Skills Course	80 to 100%	27	64.3	82.52
	Below 80%	15	35.7	78.73
Concepts Course	80 to 100%	101	82.8	83.58
	Below 80%	21	17.2	78.62
Both Courses	80 to 100%	128	78.0	82.41
	Below 80%	36	22.0	77.82

Hypothesis 3 predicted that grade performance for students who attend class regularly is not significantly different from grade performance for students who do not attend. As shown in Table 2, the average course grade of those with high attendance (80 to 100%) is higher than that of those with low attendance (below 80%). T-test results show students in the high attendance group averaged 4.59 percent higher grade performance than students in the low attendance group ($t = 1.99$, 66 df, $p = 0.018$). The difference in final grade between high attendance and low attendance groups is statistically significant; therefore, hypothesis 3 is not supported.

One-way analysis of variance was used to explore the relationship between attendance and final grade within each course. As shown in Table 2, for the IT skills course, means analysis shows a higher mean final grade for students with attendance in the 80-100% range (82.52) than for students in the below 80% attendance range (78.73). However, this difference is not statistically significant, $F(1,40) = 1.599, p = .219$. In a similar way, for the IT concepts course, means analysis shows a higher mean final grade for students with attendance in the 80-100% range (83.58) than for students in the below 80% attendance range (78.62). However, there is a statistically significant relationship between attendance and final grade for the IT concepts course, $F(1,120) = 4.463, p = .037$. (See Table 2). Although there is no difference in grade performance for students who attend class regularly when considering both courses, there is a significant difference for students who attend class regularly in the IT concepts course.

5. Summary

Hypothesis one was not supported: Attendance for students in the IT skills course was significantly different from attendance for students in the IT concepts course. Hypotheses two was not supported: Grade performance for students in the IT skills course was significantly different from grade performance for students in the IT concepts course. Hypotheses three was not supported: Grade performance for students who attend class regularly is significantly different from grade performance for students who do not attend regularly.

The results of this study provide confirmation that attendance is a factor affecting grades in IT concepts (lecture-type) courses, corresponding with previous research. Although the final grades were higher in the IT skills courses for those with higher attendance records, the results were not significant enough to be conclusive.

6. Limitations

This study involved a convenience sample of courses where data would be available for comparison. A larger sample, especially of IT skills courses, would enhance the study. Additional demographic data could be included regarding possible differences by age and gender.

7. Recommendations

Additional comparisons of IT skills courses should be completed to increase the quantity of data used for analyses. In addition, the study could be expanded to explore students' decisions as to whether to attend class and receive assistance from the instructor or work on their own. For example, some students may already have experience with this software and/or enough background to do well on their own. Some students might simply prefer not to go to class when that is an option. Others may think they have adequate experience to learn the materials on their own and will not realize that they do not have a good enough understanding to be successful on tests until they see the test results. Some may base their decision as to attendance on the time of day the course is provided.

In schools where an IT skills course is available both on-campus in a lab environment and online, further comparisons could be made of those receiving in-class face-to-face assistance

versus those receiving only electronic assistance.

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