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In this issue:

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The Effect of Class Duration on Academic Performance and Attendance in an Introductory Computer Class

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Abstract

Universities today struggle to allocate resources such as classroom space and personnel while maintaining quality instructional delivery, student retention, and research opportunities for faculty members. Scheduling of courses is a factor affecting each of these areas. This study examines the effect of class length on student performance and attendance in introductory computer information system classes. Attendance records, exam grades, final course grades, and performance on pretests and posttests are compared in classes that meet in 50 minute class periods and 75 minute periods. Results indicate that there is no statistical difference in the academic performance and attendance records of students.

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1. Introduction and Background

As enrollments in universities increase across the country, institutions are finding it increasingly difficult to schedule classes in limited facilities. An article in *University Business* (2004) discusses the difficulties in space utilization and scheduling because enrollment levels in colleges continue to increase while classroom space continues to decline as the majority of new space is dedicated to uses other than instruction. Universities are exploring various ways to regain teaching time on unpopular days such as Fridays by encouraging faculty to test and quiz more on Fridays (Young, 2003). Schools such as the University of Oregon are exploring tuition incentives to encourage students to enroll in courses offered at unpopular times (Farrell, 2002). Even though enrollments for IS majors continue to decline, many departments are still responsible for instructing the growing numbers of stu-

dents required to take introductory level courses to meet computer literacy requirements.

Students on the other hand, many times have very marked preferences for class times, leaving many inconveniently scheduled classes with low enrollments. More students are working while in college and increases in non-traditional student enrollment mean students have more obligations outside of class than before. In addition, more faculty members are being asked to increase their research load while maintaining their teaching load. Many faculty also feel that 50 minute classes three times a week do not allow for the same amount of teaching time as the first minutes of the class are settling and making announcements. As a result, some schools are implementing four day class weeks to combat some of these problems. Some of the added benefits realized by these programs are des-

ignated times that do not interfere with class times to allow faculty to attend development activities and complete committee or research work as well as give students set preparatory time or time to explore professional opportunities (Snyder, 1999). From a pragmatic standpoint, these changes make sense for the institution but what are the effects on CIS classes and the pedagogical implications for students.

Although research seems to suggest that classes meeting three days a week are more effective than those meeting one or two days a week (Henebry, 1997), conflicting research suggests that the most commonly skipped classes occur on Fridays. Henebry also argues that the drop out rate and non-failing rate is higher in classes with more frequent meetings, but cautions that shorter class periods potentially result in too little teaching time. Rayburn and Rayburn (1999) studied the performance of accounting majors in 8 week and 16 week managerial accounting classes that met for 150 minutes sessions and 75 or 50 minute sessions respectively. In this study, the researchers determined that student performance was better in the courses that stretched over the 16 week period with shorter instruction periods but the purpose of the study was more focused on the differences in the total duration of the course as opposed to the length of each unit of instruction time.

With potential impact on attendance, particularly on Fridays, administrators need to examine relationships between scheduling and absenteeism. Attendance in freshman classes is a problem that continues to vex many faculty members and university administrators. When surveyed why they skip class, students provided reasons from boredom to weather but it is important to note that 16% of the students reported skipping classes because of inconvenient times and locations (Gump 2004). Ultimately, these reasons and many more result in approximately 33% absentee rate in a typical class each instruction period with attendance lower in core classes (Romer, 1993). Many research reports link the importance of attendance to grade performance in class (Haberyan, 2003 ; Gump, 2005 ; Marburger, 2001 ; Moore, Jensen Hatch et al., 2003) which in turn can affect retention and graduation rates at institutions. Marsburger (2001) linked attendance to performance in

economics courses by stating that students who missed an instruction period were more likely to miss questions on the exam that related to content covered that day. Gump (2005) found a strong negative correlation between absences and final grades in large undergraduate education classes

Another factor to consider when discussing length of instruction periods is student attention span. In examining computer instruction strategies, Kalman and Ellis (2004) found that computer instruction has remained virtually unchanged over the past 20 years with most instruction taking place in instructor demonstration format. With significant levels of instruction in survey courses still maintaining aspects of the traditional lecture, the effect of class length on the student's ability to remain attentive also needs to be considered. In an often cited study on attention span during lectures, Johnstone and Percival (1976) found that attention declines over time in somewhat predictable patterns. After the initial "settling down" period, the first decline in attention happens 10 to 18 minutes later and the attention patterns fell to only 3 to 4 minutes by the end of the lecture. Building on this research, Burns (1985) studied presentation dynamics and attention and recall. Burns found that recall was highest during the first five minutes of a presentation, lower during the next ten minutes, with recall being the lowest in the final five minutes of the twenty minute presentation. Burns also discovered that more than 40 concepts or "bits of information" lead to less impact as information overload occurred.

With these factors in mind, this study is an exploratory examination of the effects of classroom instruction period with respect to student attendance and academic performance. The study will attempt to determine if providing instruction in 50 or 75 minutes will affect the students' ability to perform in the class and will review some of the pertinent literature examining pedagogy and cognitive abilities linked to class duration. Academic performance in this study will be explored through several indicators such as final grade, exam grades, and improvement from pretest to post tests administered at the beginning and end of the semester.

2. Method

Participants

The subjects of the study were comprised of 125 undergraduate students enrolled in an introductory computer class in the Spring of 2007. Students represented a variety of majors and classifications from freshman to seniors. Demographic data was not available on individual students. Participants were notified via the course syllabus that this data was being collected and any student could opt to not have their data included. Any students who officially withdrew at any time during the data collection period were not included in the study.

Course Sections

Students were enrolled in introductory computer classes that met either on a Monday, Wednesday, Friday schedule or on a Tuesday, Thursday. Classes scheduled for three days a week met for 50 minutes and classes that met two days a week met for 75 minutes. In addition to the lecture portion of the class, students also enrolled in a separate lab section. The lecture portion of the class covers the basics of computer literacy from identifying input and output to ethics and using the World Wide Web. Lab periods covered use of application software from the Microsoft Office suite. Attendance and performance information from the lab section of the course will not be included in this study because all lab periods are the same length and the focus of the study is duration of lecture period. In order to analyze class sections at similar times with similar class sizes, sections taught in the morning were selected for the study. These classes were taught by two instructors, each having one class on the two day schedule and one class on the three day schedule.

Data Collection

Attendance was recorded daily by the instructor of the section and compiled in an Excel spreadsheet. Attendance was generally taken at the beginning of the class period either by roll call or sign in sheet. In order to accommodate missing data due to instructor absence and inclement weather, a random sample of 20 days of attendance records were identified to be examined. The sample was random to capture data at various times throughout the semester and

to avoid bias in excluding days that may or may not have attendance data that met the researcher's perceived outcomes.

For academic performance measurements, three indicators of performance were studied. Scores on three exams covering topics in the course textbook and lecture were collected for analysis. This data was collected in order to study performance in lecture alone without the effect of any lab work that occurred outside the normal classroom instruction time. Final course grades were also submitted to the researcher for all students. This final grade was comprised of the student's grades from lecture as well as lab work. No portion of the final grade was based solely on attendance. In addition to final grades, student performance on two tests was also compared. On the first day of class, students were given a final exam from the previous semester to gauge their general knowledge of computers. This grade was compared to the grade on the course final exam which covered course concepts of basic computer literacy. Students who did not take one or both of the exams were excluded from this data set.

Data was entered in SPSS for statistical analysis to determine if there were significant differences in the performance and attendance of both groups. Independent samples t-tests were conducted to determine statistical significance between the two populations.

Results

After comparing the mean results of each indicator of performance and attendance, it was determined that there is no significant difference between the average performance and attendance of students in either the class of 50 minute or 75 minute duration. Attendance rates for both classes were approximately 75% and performance on both the exam average and final grades were in the high C to low B range. Although the change in grades in both classes were impressive at almost 30 points improvement in pre test and post test conditions, there was not enough evidence to attribute a difference between the two instruction periods of differing lengths.

Duration of Class and Attendance

The number of days attended for the 50 minute class period ($M=15.82$; $SD=3.26$) were not significantly different than the number of days attended in the 75 minute class period ($M=15.13$; $SD=3.63$): $t(125)=1.122$; $p=.26$.

Duration of Class and Exam Average

The average of three lecture exams in the classes were not significantly different between the 50 minute class ($M=76.42$; $SD=12.61$) and the 75 minute class ($M=77.37$; $SD=11.09$): $t(124)=.448$; $p=.655$.

Duration of Class and Final Grade

The average final grades received in the classes were not significantly different between the 50 minute class ($M=80.22$; $SD=14.17$) and the 75 minute class ($M=80.44$; $SD=15.07$): $t(125)=.087$; $p=.931$.

Duration of Class and Change in Pretest/Posttest Grade

The average change in score from the 50 minute pretest and post test scores ($M=29.31$; $SD=10.80$) was not significantly different than the change in scores from the 75 minute class pretest and post test scores ($M=27.87$; $SD=14.63$): $t(110)=.595$; $p=.553$.

3. Discussion

Because these findings suggest that the length of instruction period does not affect performance or attendance in introductory computer courses, departments can be assured that the flexibility needed in scheduling these classes and allocating resources accordingly will not have a detrimental effect on the learning process. Departments should be able to schedule sections to meet student demand as well as the needs of faculty and the classroom resources of the institution. This is particularly important in institutions where there is a need to schedule numerous sections of introductory courses.

Whichever instruction period is implemented, faculty should examine teaching methods to help combat some of the problems associated with the different time periods. For shorter time periods instructors

should aim to lessen the "settling down" periods at the beginning of class to maximize instruction time and should implement incentives or requirements to ensure attendance and participation on Fridays which are the most commonly missed classes. Instructors teaching on two day schedules with longer class periods should be cognizant of limitations in attention span and utilize instructional techniques to keep students alert and engaged. Including mental breaks by incorporating demonstrations, short media clips, or discussion of related topics or real world examples can keep the students alert and enhance learning that will outpace any time lost due to interruption in the lecture (Johnstone & Percival, 1976).

Instructors who have low attendance in either 50 or 75 minute lectures should try to determine why students are skipping class. If the low attendance is something that is out of the instructor's control such as weather, then instructors may consider incentives for attending class. If there are other reasons such as boredom or lack of interest in topic, the instructor needs to examine the material and manner in which it is being taught if improvements in attendance and ultimately student performance are desired (Gump, 2004). Ultimately, the instructor needs to be aware of reasons for chronic attendance problems and should plan instruction time in the most efficient manner, taking into consideration the pitfalls associated with both instruction time periods.

4. Limitations of the Study

This study focuses on the performance and attendance in students in introductory computer classes, particularly the lecture portion of the class. Additional study needs to be conducted on higher level courses which many times will include more hands on work. These courses present their own challenges in instructional strategy and may be affected differently by the amount of time available in each instructional period.

Additionally, due to low enrollment in afternoon classes, this study was unable to determine if the same relationships would exist for afternoon or evening classes. We were unable to get sufficient sample sizes to allow us to study the difference in time as well as day due to low enrollment in afternoon classes. However, this aspect of scheduling

in relation to instructional period also needs to be studied for better understanding of the issue. In addition to time of day, longer terms of study would reveal more information. Larger samples as well as information from both fall and spring terms may yield additional insight into the topic.

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